EDUCATION

PUBLIC EXPENDITURE REVIEW

GUIDELINES

WORLD BANK GROUP
Education Global Practice

TABLE OF CONTENTS

ACRONYMS

ACS	Average Class Size
AY	Academic Year
BIA	Benefit Incidence Analysis
CBA	Cost Benefit Analysis
CCT	Conditional Cash Transfer
CEA	Cost-Effectiveness Analysis
CGE	Computable General Equilibrium
COFOG	Classification of Functions of Government
CSOs	Civil Society Organizations
DD	Difference in Differences
DEA	Data Envelopment Analysis
DHS	Demographic and Health Survey
ECD	Early Childhood Development
EFA	Education for All
EMIS	Education Management Information Systems
EPSSim	Education Policy and Strategy Simulation Model
FTE	Full-time Equivalent
GDP	Gross Domestic Product
GEM-Education	The General Equilibrium Model for Education
GER	Gross Enrollment Rate
GNI	Gross National Income
GNP	Gross National Product
GP	Global Practice
HNPGP	Health, Nutrition, and Population Global Practice
IGR	Internally Generated Revenue
INESM	Inter-agency Network on Education Simulation Models
ISCED	International Standard Classification of Education
IT	Information Technology
LGA	Local Government Authority
LGU	Local Government Units
LLECE	Laboratorio Latinoamericano de Evaluación de Calidad de la Educación, or Latin American Laboratory for Evaluating the Quality of Education
LSMS	Living Standards Measurement Study
MAMS	Maquette for MDG Simulations
MFM	Macroeconomics and Fiscal Management
MICS	Multiple Indicator Cluster Survey
MOF	Ministry of Finance
MTEF	Medium-term Expenditure Framework
NEA	National Education Accounts
NER	Net Enrollment Rate
NGOs	Non-governmental Organizations
NSOs	National Statistical Offices
OECD	Organisation for Economic Co-operation and Development
PASEC	Programme d'Analyse des Systèmes Educatifs de la CONFEMEN (the CONFEMEN Programme for the Analysis of Educational Systems)
PCF	Per Capita Financing
PEFA	Public Expenditure and Financial Accountability
PER	Public Expenditure Review
PETS	Public Expenditure Tracking Survey
PFM	Public Financial Management
PIAAC	Programme for the International Assessment of Adult Competencies

PIRLS	Progress in International Reading Literacy Study		**TVET**	Technical and Vocational Education and Training
PISA	Program for International Student Assessment		**UIS**	UNESCO Institute of Statistics
PPP	Purchasing Power Parity		**UNESCO**	United Nations Educational, Scientific and Cultural Organization
PTA	Parent-Teacher Association			
PTCA	Parent-Teacher Community Association		**WB-MAMS**	World Bank's Maquette for MDG Simulations
PTR	Pupil-Teacher Ratio		**WDI**	World Development Indicators
QSDS	Quantitative Service Delivery Surveys		**VFM**	Value for Money
RDD	Regression Discontinuity Design			
SA	Social Assistance			
SABER	Systems Approach for Better Education Results			
SACMEQ	Southern Africa Consortium for Monitoring of Education Quality			
SBM	School-based Management			
SDGs	Sustainable Development Goals			
SDI	Service Delivery Indicators			
SERCE	Second Regional Comparative and Explanatory Study			
SES	Socioeconomic Status			
SNA	System of National Accounts			
STEP	The STEP Skills Measurement Program			
STR	Student-Teacher Ratio			
SWAP	Sector-wide Approach Program			
TERCE	Third Regional Comparative and Explanatory Study			
TIMSS	Trends in International Mathematics and Science Study			

PREFACE

Public expenditure reviews are one of the World Bank's core diagnostic tools for informing various stakeholders about the state of education financing in a country. Such reviews assess the efficiency, effectiveness, and equity of expenditures on education and their adequacy and sustainability relative to the country's educational goals. They review not only public spending, but also private and donor spending.

Guidelines for public expenditure reviews in education establish content and quality standards for such reviews in the sector, using technical notes and examples to deepen the user's understanding of how to meet these standards. The World Bank prepared the last public expenditure review guidance for education in 2004 and revised it in 2009 as part of the Human Development sector-wide initiative. The document included a cross-sectoral Core Guidance and a sector-specific Guidance for each sector. This Guidance covers both cross-sectoral and education sector-specific issues in one volume.

The new Guidelines update the contents of the earlier guidelines to reflect recent developments in education financing and respond to demands for more hands-on advice, as follows: (i) they adopt the World Bank's new initiative—Systems Approach for Better Education Results (SABER) School Finance Framework—as the basis for the analytical dimensions; (ii) they use a decision-tree approach, providing step-by-step guidance for conducting public expenditure reviews under different context, scopes, and types of analytical tools; (iii) they analyze policy recommendations in completed public expenditure reviews, assessing why each is good or weak; (iv) they introduce a new analytical tool, BOOST, which converts government budget data into a useful format, makes analysis relatively easy, and contributes to the development of the comprehensive education-finance data accounts called National Education Accounts; (v) they enhance discussions of governance and public financial management issues that partly determine effective spending; (vi) they strengthen technical notes by including more details on data sources and definitions of concepts and variables; and (vii) they update good analytical examples from completed public expenditure reviews, categorized by topic.

Sachiko Kataoka led a team under the guidance of Luis Benveniste (Director, Education Global Practice) to develop the new guidelines. The team included Sue Berryman, Yulia Makarova, and Aliya Bigarinova, and also relied on a number of colleagues who provided insightful comments throughout the process. Specifically, the team is grateful to: Dina Abu-Ghaida, Samer Al-Samarrai, Mohammed Audah, William Dorotinsky, Kebede Feda, Katia Marina Herrera Sosa, Margo Hoftijzer, Jennifer Klein, Shinsaku Nomura, Anna Olefir, Shawn Powers, Holy Tiana Rame, Furqan Saleem, Lars Sondergaard, and Ryoko Tomita Wilcox. The team also would like to thank Husein Abdul-Hamid, Melissa Adelman, Jung-Hwan Choi, Jennifer Klein, Laura Gregory, and Kirsten Majgaard for helping to compile recent public expenditure reviews to develop a database.

USER'S GUIDE

This guidance note applies to all countries, regardless of their circumstances. It seeks to remind the analyst of the main features that are normally included in an education public expenditure review (PER). However, analysts should not use it as a checklist to which they must rigidly adhere. Every review must be selective in what it covers, based on such factors as what is needed for the country dialogue; what is already known and available elsewhere; and what is able to be accomplished given constraints of time, data, and funding. Analysts may omit topics, but with a justification in mind. In addition to agreeing in the concept note on the planned topic coverage, it is useful to convey to the reader of the full report the reasons for omitting any major themes. Similarly, the depth of treatment of any included topic will need to be considered, agreed upon, and explained. Conditions such as fragility, conflict, or violence in the country under review could affect whether a PER can be conducted at all. Such factors can also affect the quality of the data needed to conduct a review, as well as the ability of the country to implement any recommendations that the review suggests.

CHECKLISTS

Part I of the Guidelines provides a checklist for steps, from preparation to dissemination, of an education PER, including cross-sectoral questions, such as the overall budget and potential tradeoffs between social and other sectors. The PER team will first go through a decision tree to determine the scope, objectives, analytical tools, and policy questions for a particular review. The next steps will probably vary for different circumstances.

Part II provides a checklist for an analysis to be completed as part of an education PER, organized by six key questions:[1]

1. Who finances education and how are funds channeled?
2. How much does the government spend and on what?
3. Is the public financial management system set up to enhance financial accountability?
4. Relative to the government's policies and standards, how much is needed now (adequacy), and what can be afforded in the medium and long term (sustainability)?
5. Are public resources being used efficiently and effectively?
6. Does public spending promote equity?

To keep the checklists as skeletal as possible, three different types of links are used to let review teams explore a topic in more depth. Two types of links are internal to this document. They take the analyst to in-depth technical notes and examples of good treatments of a PER topic, with **red for Technical Notes** and **blue for Examples**. The third type of link, **in purple**, signals a hyperlink to an external resource. Users of these Guidelines may also consult **Solutions Notes**, which provide concrete solutions for specific education financing issues, to help them frame good policy recommendations. These Notes will be made available at http://www.worldbank.org/en/topic/education. Examples and Solutions Notes will be regularly updated.

⬬ **Technical Note:** A Technical Note elaborates on a concept or provides detailed guidance on analytic methods, indicators, and sources relevant to the topic.

⬬ **Example:** An example shows an especially good treatment of a topic. It often includes the description of analytic methods used and other guidance. Examples are taken from recent PERs and will be updated as more good case studies become available.

If the analyst is working from an electronic version of these Guidelines, clicking on a color-coded oval that appears next to a topic in the checklist will take the reader to the material connected to that link. For hard-copy versions of the Guidelines, all Technical Notes germane to **Part I** and **Part II** appear at the end of Part II in numerical sequence. **Part III** consists of the Examples.

PART I:
CHECKLIST FOR
EDUCATION PER STEPS

Introduction

Why is education finance important?

All education systems rely on financing to function. Education finance systems pay for the inputs required to implement education policies, such as teachers, school buildings, and learning materials. Availability of financial resources does not guarantee a quality education, but a quality education is impossible to achieve without adequate resources. Some uses of education expenditures can make a marked difference in learning, particularly in the cases of inputs that directly benefit students or resources that compensate for challenges arising from low-income settings. The same money can be wasted if it is allocated to input factors that only marginally affect learning or if policymakers fail to consider the conditions that must be met for factors to translate into learning gains.

Governments are under increasing pressure to use education resources efficiently, but often lack guidance on the optimal ways to invest and manage their school finance systems. Research findings have shown that learning outcomes are not strongly related to spending levels (except in cases where education budget is very small), suggesting that the way money is spent—and not simply how much is spent—matters in education finance.

Meeting the World Bank's twin goals of poverty reduction and shared prosperity in the education sector implies the need to use country and donor resources effectively, efficiently, and equitably. A sound PER assesses how resources are used relative to these goals. In Part II, Sections 5 (Effectiveness and Efficiency) and 6 (Equity) are especially germane to these analytic standards.

Public Expenditure Review Steps

This section provides guidance on steps involved in conducting a PER, from the preparation to dissemination of results, as summarized in Figure 1. It highlights issues common to such reviews, regardless of the sector, and addresses shared considerations and such cross-sectoral questions as the overall budget and potential tradeoffs between social and other sectors.[2]
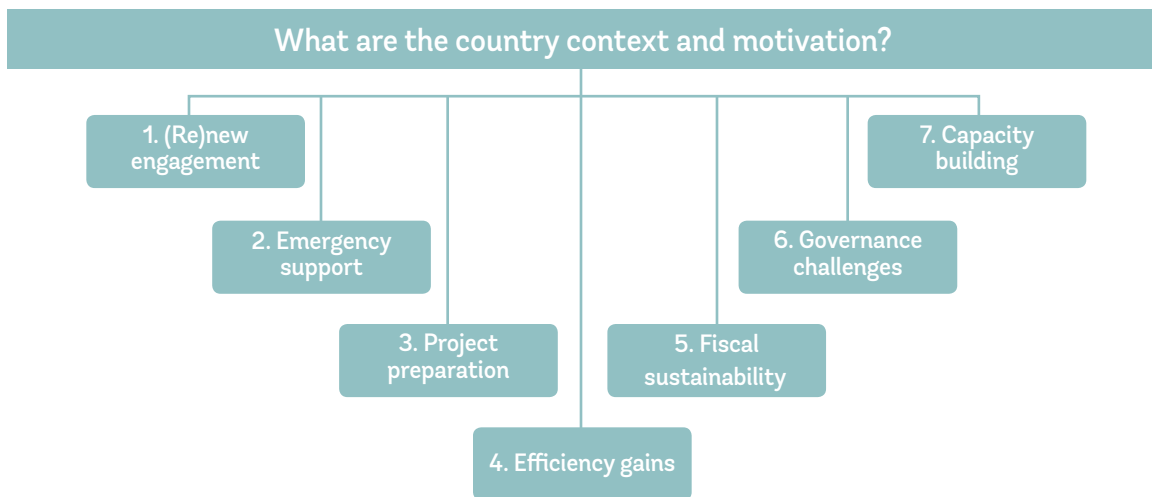
Figure 1: Public expenditure review steps

1   **STEP 1: Understanding the context and motivation**

Understand the country context and motivation of the PER. See Figure 2 for seven possible scenarios which may direct the PER team to a particular path.

2   **STEP 2: Defining the scope and objectives**

Review key policy documents such as the education strategy, sector analysis, and latest PER recommendations to define the possible scope, objectives, and policy questions for the review. Agree on them with the client.

3   **STEP 3: Securing access to data and information**

Identify available financing and non-financing datasets as well as policy and legal documents. Depending on data availability, the scope may need to be modified.

4   **STEP 4: Analyzing data and information**

Assess the country's education finance system, financial accountability, adequacy and sustainability, efficiency and effectiveness, and equity of education financing. PART II will discuss the analysis in depth.

5   **STEP 5: Validating key findings and policy recommendations**

Discuss and validate key findings and policy recommendations with the client, possibly holding separate sessions for technical Ministry of Finance (MOF) and Ministry of Education (MOE) staff and for MOF and MOE policymakers. Disseminate the final report to various stakeholders.

STEP 1: Understanding the context and motivation

The very first step is to understand the country context and motivation of the public expenditure review. Figure 2 suggests seven possible scenarios under which the review could be conducted. The scope, objectives, and key questions may vary widely, depending on the scenario.

Figure 2: Seven scenarios for country context and motivation

What are the country context and motivation?

1. (Re)new engagement
2. Emergency support
3. Project preparation
4. Efficiency gains
5. Fiscal sustainability
6. Governance challenges
7. Capacity building

Scenario (1): (Re)new engagement. We have not been engaged in the education sector of the country for a long time or have never been engaged, and need to (re)gain our knowledge about its education financing to renew or initiate our engagement.
- When was the last education public expenditure review conducted for the country?
- If a review has not been conducted in the last five years, does other sector analytical work exist that can inform you about key issues to be addressed?
- Can those available documents give you a good understanding of key challenges to be addressed?
  - ➤ These questions affect the decisions on scope and objectives. To explore key issues, focus on all six sections of the guidelines.

Scenario (2): Emergency support. The country has recently experienced a crisis (natural, political, or economic), and the Bank needs to assess quickly what kind of financial support the government needs.
- What are the major funding items that need urgent support? Possibilities might include repair of damaged schools to restore access, payment of teacher salaries to avoid teacher absenteeism, and financing of cash transfers or school meals to avoid dropouts.
- Can the Bank, in collaboration with other development partners, establish appropriate funding mechanisms?
  - ➤ Under a crisis situation, the ***Reference Guide on External Education Financing***, published by Inter-Agency Network for Education in Emergencies (INEE), may be more suitable than these Guidelines.

Scenario (3): Project preparation. We want to conduct a public expenditure review to inform the preparation of a new education project.

- Has the subsector for the new project already been decided?
    - ➢ If yes, the review should focus on the chosen subsector, with a thorough examination of six key questions for the subsector.
    - ➢ If no, the review should analyze existing key documents and overall education spending, examine subsectoral allocations, and identify education finance policy issues to be addressed, by going through all six sections.

Scenario (4): Efficiency gains. The government is facing budgetary constraints and has asked the Bank to analyze public expenditures on education to find fiscal space.[3]

- Does the government (Ministry of Finance) have a budget-reduction target for the education sector? How imminent is such a cut?
    - ➢ In the short term, there is probably little that the Ministry of Education can do besides cutting capital and non-salary, recurrent spending because any reductions in personnel costs usually must be phased in.
    - ➢ In the medium term, the public expenditure review should explore potential savings across the entire sector, including rationalizing human resources. At the same time, the review may play a role in defending the education budget if an analysis finds little room for efficiency gains without harming access and quality. Focus on Section 5: Efficiency and Effectiveness.

Scenario (5): Fiscal sustainability. The government plans costly reforms, such as an extension of general education, and needs to know the capital and recurrent cost implications of the plans, as well as their fiscal sustainability and equity implications.

- A simulation analysis would be essential to inform the government about the feasibility of such a plan
    - ➢ Focus on Section 4: Adequacy and Sustainability and Section 6: Equity.

Scenario (6): Governance challenges. The government is concerned that public funding is not reaching schools and wants to identify possible issues with public-finance management.

- What are major spending problems?
    - ➢ It is likely that certain public financial management (PFM) weaknesses are underlying causes of the spending problems. Focus on Section 3: Fiscal Accountability.
    - ➢ Also consider other analytical instruments such as Public Expenditure Tracking Surveys (PETS) and Quantitative Service Delivery Surveys (QSDS), provided that there is sufficient budget to conduct them. Go to ⬤**Technical Note 12: Public Expenditure Tracking Surveys (PETS), Quantitative Service Delivery Surveys (QSDS), and Service Delivery Indicators (SDI)**.

Scenario (7): Capacity building. The government would like to strengthen its analytical capacity and wants the Bank to help it conduct a PER.

- In this case, the main objective is to support the government. The client's engagement and ownership are as important as the final output. This will require more time and budget for close communication with the client.

STEP 2: Defining the scope and objectives

There are many factors to consider when defining the scope and objectives of an education PER. Such a review is primarily concerned with public revenues and expenditures as expressions of public policy and public involvement in the economy. A public expenditure review also examines private spending. Rarely can public resources meet all financial needs, and private spending may play a major role in providing educational services. Many kinds of analyses can be conducted in a public expenditure review, but obviously, such analyses must be aligned with the project's budget, time frame, and data availability, as well as its overall focus and goals. The team needs to:

- Review key relevant documents such as the education strategy, sector analyses, and recommendations of the last public expenditure review, to identify education finance policy issues to be addressed.

- Decide the subsector focus. The review can have broad coverage (all subsectors, possibly even including adult education) or narrow coverage (a single subsector). State your focus clearly, why you decided on it, what has been excluded, why certain issues or subsectors have been excluded, and whether or how these exclusions might affect the due diligence purpose of the review. Broad, unfocused public expenditure reviews will be less effective than sharply focused ones.

- Place education spending within a macro context. Confer with the Bank's country economist— and, as needed, with the Ministry of Finance (MOF)—about the country's macroeconomic situation and its implications for education budgets downstream.

- Make sure that your education public expenditure review—if part of a multisectoral (comprehensive) PER—fits the purposes of the comprehensive PER, but still respects your main objectives. In the multisectoral case, where several sector-specific reviews feed into a comprehensive PER, the concept note for the overall review should clarify the objectives of the overall PER and the expectations for each of the sector-specific reviews. Although the expectations for the sector-specific reviews are often poorly defined, be sure to define the focus of the education PER and then clear it with the team leader for the comprehensive exercise.

- Work to ensure that a comprehensive public expenditure review is more than the sum of its parts. Typically, each sector does its analysis in isolation, and the team leader then combines all sector-specific reviews into one document, including three to five recommendations per sector. By itself, the education review team cannot create incentives for members of comprehensive PER teams to realize the potential synergies within the context of a comprehensive public expenditure review. However, the leader of the education review can at least ask the leaders of the comprehensive review and of the other sector-specific reviews how the overall team might benefit from this specific, comprehensive public expenditure review.

- Check that the time and budget[4] allocated to you for the education review are in line with your intended scope and its data requirements. Ultimately, the budget and time frame available to prepare and undertake a PER will be decisive in specifying its scope and in setting priorities. Be aware that resources may be needed for the following:

  ▷ Missions to assemble data and information (travel costs and staff days).
  ▷ Extensive data recoding and cleaning or new data collection. The early childhood development (ECD), technical and vocational education and training (TVET) and higher education subsectors often lack data required to conduct a review. If the scope of the review includes any of these subsectors, the team may need to collect new data.
  ▷ Days required to analyze data, write the draft public expenditure review, and revise it after peer reviews.
  ▷ Missions to discuss results and disseminate them more broadly, such as running a workshop for stakeholders (travel costs and limited staff days).
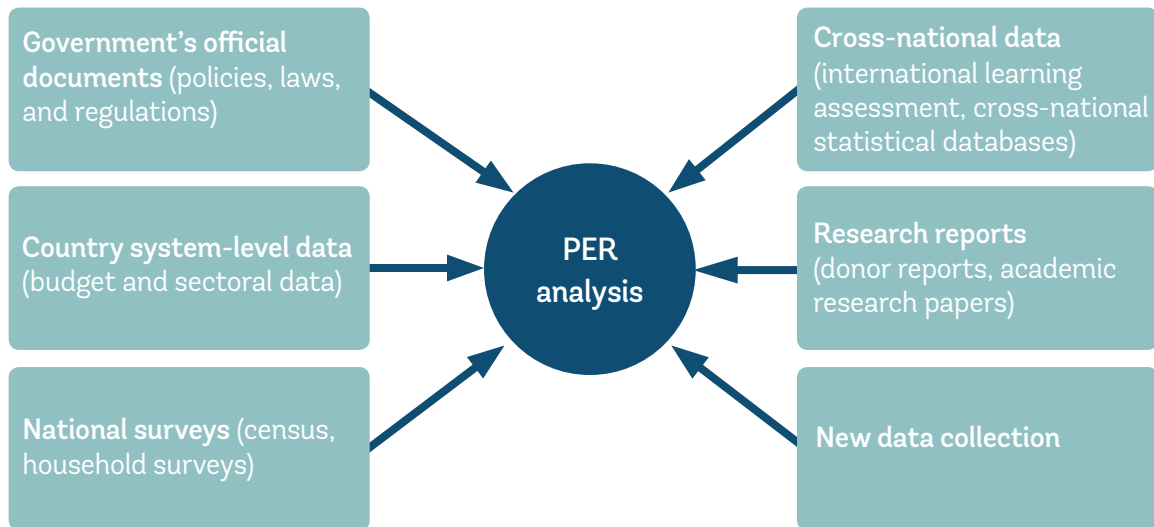 ▷ Follow-up policy discussions.

- Once you predefine the scope, discuss it with the key counterparts (typically, the Ministries of Education and Finance) and agree on the scope, objectives, and policy questions for the review during the first mission. Based on the discussion with counterparts, you may need to modify the scope or objectives. This process will help enhance the client's ownership of the report and bolster the chances that findings and policy recommendations will be accepted and implemented. The following meetings may prove helpful:

  ▷ Connect with high-level policymakers (Ministers of Education and of Finance, their Deputy Ministers, or equivalent) to explain the objectives of this work and potential benefits to them, and to obtain their approval for this work. Note that since the Ministry of Finance is the primary client for a PER, the Ministry of Education may know little or nothing about this work. Thus, it is essential to obtain education policymakers' approval before asking their staff to compile and provide data for the project.
  ▷ After you get the decision maker's go-ahead, set up meetings with (i) the Education Management Information System (EMIS) team, finance or accounting team, assessments team, and any other unit that has data that you need; and (ii) heads of departments over seeing the levels or topics of education that you plan to analyze to ask them what they see as the main challenges in their respective areas (e.g., early childhood development, secondary education, or teacher policy).
  ▷ Set up meetings and reach out to key players outside the Ministry to get a broader perspective. Try to visit at least a few schools (ideally, ones different enough to give you a broad picture of the system, e.g., urban and rural, primary and secondary, public and private, wealthy and poor). These school visits can be combined with conversations with local officials who oversee schools at the subnational level, as well as with principals, teachers, and even parents. If you think teacher unions or civil society organizations (CSOs) might offer a useful perspective, ask to meet with them as well.

STEP 3: Securing access to data and information

The nature and number of subsectors to be analyzed within the scope of the review helps to determine the datasets and documents that the PER team will need; data availability, in turn, affects decisions on the final scope of the project. Once there is an overall agreement on the scope, the team needs to secure access to reliable data. Good-quality data are accurate, timely, and relevant for decision-making.[5] Be clear ahead of time about data sources, their availability, and their consistency, because they can constrain the scope of the report and its quality. When the education review is part of a comprehensive public expenditure review, discuss with the overall team leader how to maximize efficiencies, such as hiring a shared consultant or research assistant for data collection and analysis. Also determine if the team conducting the macro analysis for a comprehensive review will create a government-budget database that the education review team can use (e.g., BOOST). A public expenditure and financial accountability (PEFA) country report might be available, which could prove useful for an assessment of the Public Financial Management (PFM) system relevant to education. In addition, examine the websites of the country's Ministries of Finance and Education and national statistics agency. These websites often post significant amounts of data, or, at the least, alert you to the existence of databases to which you can request access.

Public expenditure reviews use various types of data. *Financial data* usually come from the Ministry of Finance and sometimes from the Ministry of Education's budget department. If financing is decentralized for any subsectors within the scope of the review, financing data may be available by subnational unit at the national-level Ministry of Finance. In other cases, you may need to sample subnational units to assemble the needed data. If your scope includes autonomous institutions, such as universities or technical and vocational schools, you will probably have to obtain financing and expenditure data from the institutions themselves. Private and household contributions may be recorded separately, or estimated based on household survey data. *Non-financial data*, such as the numbers of students, teachers, schools, or classes, usually come from the education management information systems (EMIS) or equivalent, managed by the Ministry of Education. Detailed student assessment data are useful for measuring spending against performance. Whether for financial or non-financial data, you should get both aggregate data at the national level and data as disaggregated as possible at the school or provider level, or at least at the locality or municipality level, for the level(s) of education on which you plan to focus your analysis. In sum, public expenditure reviews use the following six types of data (see Figure 3). The Technical Notes for these six types of data describe common sources for each type and assess the usual quality of each:

Figure 3: Six types of data that can be used for PER analysis

Government's official documents (policies, laws, and regulations)		Cross-national data (international learning assessment, cross-national statistical databases)
Country system-level data (budget and sectoral data)	PER analysis	Research reports (donor reports, academic research papers)
National surveys (census, household surveys)		New data collection

- ➤ Government's official documents, such as policies, laws, and regulations governing inputs to, and financial arrangements for, the learning process (see ⬤**Technical Note 1**).
- ➤ Country system-level data (e.g., BOOST, EMIS, national assessments; see ⬤ **Technical Note 2**).
- ➤ National surveys such as census and household surveys (see ⬤ **Technical Note 3**).
- ➤ Cross-national data such as international learning assessment and cross-national statistical databases (see ⬤ **Technical Note 4**).
- ➤ Research reports (see ⬤ **Technical Note 5**).
- ➤ New data collection (see ⬤ **Technical Note 6**).

The team also needs data for comparisons. Many indicators, especially various measures of spending on education, do not carry an intrinsic absolute value. We do not know, for example, what "adequate" levels of spending on education would be without situating the PER country within the range of values associated with other countries. Hence, it is essential that a public expenditure review also analyzes the following:

- • Statistical comparisons with other countries in the same region or at similar income levels, and with other countries that serve as aspiration goals for the country, such as those in the Organisation or Economic Co-operation and Development (OECD). Comparisons can be affected by demography (cohort sizes for school-age individuals), participation rates by subsector, unit costs by subsector, and cross-country differences in the structures of education systems.[6] Obviously, financing requirements for small school-age cohorts or cohorts with low enrollment rates are less than those for large cohorts or cohorts with high enrollment rates (especially in the more costly subsectors). These comparisons are descriptive by nature and provide neither a diagnosis nor an explanation. Nevertheless, comparisons can show that a country performs significantly worse (or better) than "expected." Such comparisons can help set some "reasonable" quantitative targets for policymakers and even provide an incentive to reach them.
  ⬤ **Technical Note 4: Cross-national data**

- • Trend data that allow comparisons over time. These are essential for gauging how quickly the country may be reaching its target. If improvements are slow in coming, trend data can provoke a deeper exploration into the reasons for the lagging performance.

STEP 4: Analyzing data and information

These Guidelines provide guidance on how to conduct a public expenditure review to answer the following six key questions:

Key Questions

1. Who finances education and how are funds channeled?
2. How much does the government spend and on what?
3. Is the public financial management system set up to enhance financial accountability?
4. Relative to the government's policies and standards, how much is needed now (adequacy), and what can be afforded in the medium and long term (sustainability)?
5. Are public resources being used efficiently and effectively?
6. Does public spending promote equity?

The key concepts of each dimension of education finance are briefly described below and discussed in more detail in **Part II**.

▶ **Questions 1–2:** *The financing system* is the foundation for a country's public investment in education. These questions ask how the education budget is financed, who spends it, and how it is spent.

▶ **Question 3:** *Financial accountability* in terms of education finance sheds lights on public financial management (PFM) systems, and assesses whether such systems are set up in such a way that government policies get implemented as intended and achieve their objectives.

▶ **Question 4:** *Adequacy* of education finance responds to the question of "How much is enough now?", given the government's policies and standards. *Sustainability* of education finance assesses whether planned spending levels on education are affordable in the longer term, given the country's macroeconomic prospects, sector policies, and demography.

▶ **Question 5:** *Efficiency and effectiveness* in education finance require that systems invest in those inputs with the largest marginal returns, as measured through outputs and outcomes relative to costs, given a country's particular stage of development.

▶ **Question 6:** *Equity* in educational opportunity is a key goal of public education systems. It measures the availability of a quality education to all students, regardless of background.

STEP 5: Validating key findings and policy recommendations

You want the public expenditure review to impact the client's policies. Impact usually increases if the review team respects certain principles.

- Make evidence-based policy recommendations with an explicit link between the analysis and findings and recommendations. Avoid:
  - ▷ Findings and recommendations that do not follow from the analysis
  - ▷ Analyses that do not lead to any findings or recommendations

- **Prioritize** your recommendations. Policymakers will not act on a laundry list of recommendations. Identify a limited number of key issues—three to five per sector—where getting some traction is most critical. "Nesting" your recommendations in hierarchies can be helpful. The main recommendation (e.g., improve equity of access) can be aimed at policymakers, with the technical specifics aimed at technocrats (e.g., change the balance between programs A and B; improve program C by taking actions 1, 2, and 3). **Phasing**—short-, medium- and long-term—is another way to "chunk" recommendations into digestible form.

- Make the conclusions and recommendations appropriately **specific**, not bland and general. Place recommendations in a **feasible** social, political, and administrative context. The World Bank's public expenditure reviews have a tendency to preach the good and the moral without an appreciation of the realistic and feasible. Can each recommendation be made operational and actionable for the government? If possible, estimate the **fiscal costs** of any major reforms proposed. What **political costs** and implementation barriers are involved in each?

- Keep report recommendations short and accessible. It may be difficult to do this when laying out the analytical grounds for recommendations in a report that covers multiple sectors. One potential way to tackle this issue is to include a main report and a second volume with the technical background papers.

- Discuss the draft of the main findings and policy recommendations with the client to validate the findings and assess the feasibility of policy recommendations. While the review should present critical observations supported by analytical evidence, it also needs to be acceptable to the government to boost the likelihood of policymakers implementing the recommendations.

- Disseminate the final report to various stakeholders in the education community of the country, ideally through an in-country workshop.

It is not easy to meet these criteria for good policy recommendations. Good examples of policy recommendations that meet most of the criteria (being tied to findings, prioritized, concrete, realistic, feasible, and sometimes costed) can be found in ● **Example 1: Policy recommendations**. Tables 1 and 2 show brief examples and assessments of recommendations from the universe of completed PERs, with Table 1 focused on relatively useful ones and Table 2 on less useful ones.

Table 1: Are these recommendations useful? Probably.

Recommendation	Why is this useful?
With respect to developing an <u>equalization mechanism,</u> creative solutions are needed to ensure adequate financing for schools with low capacity to raise private funds. Although public funds are distributed in a generally progressive manner, private fees raised by schools flow overwhelmingly toward the more well-resourced institutions. Given the overwhelming share of private financing for primary and secondary education, an equalization mechanism is clearly needed to counteract the regressive nature of current funding flows. A wealth of international evidence exists on such mechanisms. One option could be to examine the current BSP program and evaluate whether it can be repurposed to allow a small share of school-raised funds to flow from more affluent schools to less affluent ones (within a district or across neighboring districts). A second option could be to revive the defunct Equalization Grant that was previously used to provide additional resources to underfunded schools. A third option could be to increase the relative funding coefficients for P3 and S3 schools under the Per Capita Grant. One approach currently being considered by the MoE is to introduce a new Building Levy, which would collect a small amount from each SDC budget into a central pool of funds, which would then be used to equalize resources among schools without increasing the fees charged to households. Regardless of the sources of funds—whether public or private—the MoE needs to ensure that all of the country's schools have at least a basic minimum level of resources available to them to provide a quality education.	The recommendation clearly states the problem and describes three concrete options for solving it. These options vary in their political economy and budget implications, giving the Government some flexibility in trading off between fiscal and political costs.

Recommendation	Why is this useful?
Continue effort to right-size the school network and teaching force. A simple estimation suggests that if the sector could attain student-teacher ratios comparable to the OECD countries over the medium term, it could save approximately 11 percent of the education budget, or around 0.6 percent of GDP per annum, in the wage bill alone. Additional savings could be achieved by consolidating the school network (including within-schools consolidation of classes). As an initial step towards school size optimization, the sector could increase the student-teacher ratio in urban schools to the average OECD level, which, according to Ministry of Education estimates, could result in savings in amount of 0.03 percent of GDP. These savings could be used to upgrade facilities, raise teacher salaries, invest in teacher qualification and procure other learning equipment, such as computers.	This review was done in response to a request by the country's Ministry of Finance to the Bank for sequenced and targeted advice, during a period of austerity, on fiscal reform options across priority budget areas, including education. The recommendation shows the cost to the country of its low student-teacher ratios. It suggests a practical way to start the process of increasing student-teacher ratios. It shows the savings from such a step, and flags the politically attractive possibility that some of these savings could be used to raise the salaries of the remaining teachers. It does not discuss options for shrinking the teaching force (e.g., hiring freeze vs. early retirement options) or lay out how long it would take each alternative to achieve the cost savings sought.
Increase the allocation to the education sector budget. Many of the key issues facing the education sector stem directly and indirectly from underfunding of the education budget. The education budget as a share of GDP stands at about 1.8 percent executed (or 2.3 percent allocated), which is below the recommended GPE levels as well as the SSA average (4.7 percent). Our estimations show that an increase to 4.7 percent (in line with SSA average) would be sufficient to help the sector address three key issues: (i) it would cover the estimated cost of absorbing the out-of-school children into the education sector, (ii) it would allow the full onboarding of all teachers who are currently not in the system, and (iii) it would allow an additional reduction in fees and other costs passed on to households that now operate as barriers to schooling for children from poor households. It is imperative that the government effectively prioritizes the education sector in its budget allocation process as outlined in the MTEF. In order to do so, the spending on the education sector as a share of the total spending should also be revised upwards, closer to the recommended 20 percent, almost doubling the current allocation share.	This recommendation goes to one of the root causes behind the multiple problems besieging the sector. Companion recommendations discuss concrete means by which the sector could efficiently ramp up inputs should the sector be better funded. This recommendation does not discuss how the sector budget could be increased because the country has the required resources. The problem in this case is political will.

Sources: Cited from unspecified, but actual, public expenditure reviews.

Table 2: Are these recommendations useful? Probably not.

Recommendation	Why is this not useful?
Expand pre-school education, while carefully considering the efficiency and effectiveness of different models.	This recommendation is not connected to the problem that it addresses. It gives no sense of the rate at which the subsector could feasibly expand. It fails to provide any specifics on what constitutes an attractive preschool model, or any data to support its recommendation to expand preschool education, such as the relative cost-effectiveness of such programs.
Unlike comparators, the sector allocates a relatively higher share of its total spending on education to post-secondary education. After a more detailed analysis of the impact of spending at post-secondary level, consider introducing cost-sharing arrangements at this level so that public spending can be reallocated to lower levels.	This recommendation is vague. What does "analysis of impact of spending" mean? Given the political costs, what are realistic options for expanding cost-sharing arrangements? Is there any reason to think that the sector can retain savings at the post-secondary level in order to reallocate them to lower levels?
Reform the curriculum to strengthen foundational skills at primary level and increase actual hours of instruction.	This recommendation is not tied to the problems that it addresses. It remains unclear whether the instructional time issue is due to low hours as specified by policy or a gap between policy and provision. The recommendation gives no guidance on fruitful curricular-reform options. If policy changes are needed to address the instructional-time problem, it gives no guidance on the potential costs of increasing instructional time, or advice on how to allocate the additional instructional time among subjects. If the problem is due to a gap between policy and provision, the recommendation fails to propose any incentives or penalties that might be used to close the gap.

Recommendation	Why is this not useful?
Better targeting of vulnerable schools and pupils would contribute to reducing inequity in education outcomes. In a context of high inequality in learning achievements, as evidenced by the PISA results, a revised targeting approach seems necessary to ensure that vulnerable pupils and schools are provided with additional resources that can contribute to improving their learning outcomes. Such targeting would need to be well coordinated with other measures to support vulnerable households, which are often managed outside of the Ministry.	This recommendation, although tied to a problem, is also vague. Are some "additional resources" more important than others? Does "better targeting" indicate that there are now programs in place focused on vulnerable schools and pupils, but that these resources have been misdirected in some way? If so, where are the leakages, and how should they be reduced? If there are no such programs, what options might be pursued?
Address early dropouts and gender disparity through the development of supply and demand-side interventions.	This recommendation flags that early dropouts and gender gaps are problems whose solution requires a two-pronged supply-and-demand approach. It gives no guidance on the types of approaches or tradeoffs among them.

Sources: Cited from unspecified, but actual, public expenditure reviews.

PART II: CHECKLIST FOR AN EDUCATION PER ANALYSIS

Part II takes users through what a comprehensive public expenditure review of the education sector should examine. There is no standard outline for such reviews. A review may focus on selected topics or specific subsections, depending on the client's priorities, the World Bank's due diligence concerns, the deadline for completing the PER, and budget. In other words, these Guidelines address the six key questions discussed in Part I in a comprehensive manner, but most public expenditure reviews may cover only some of these topics and subsectors.

Part II is structured to respond to the six questions in order. Section 1 starts with background and an overview of the education system. Section 2 discusses an overview of education financing and spending (Questions 1–2). Sections 1 and 2 are descriptive and provide a broad picture of the education finance system. Section 3 reviews financial accountability mechanisms qualitatively (Question 3). Sections 4–6 are heavily analytical and examine three principles of education finance: adequacy and sustainability, efficiency and effectiveness, and equity (Questions 4–6).

Key Questions

1. Who finances education and how are funds channeled?
2. How much does the government spend and on what?
3. Is the public financial management system set up to enhance financial accountability?
4. Relative to the government's policies and standards, how much is needed now (adequacy), and what can be afforded in the medium and long term (sustainability)?
5. Are public resources being used efficiently and effectively?
6. Does public spending promote equity?

Section 1	Background and Overview of the Education System

Background

A background section should provide the sectoral background information as well as the objectives of the public expenditure review.

- **Sectoral background.** Provide a brief summary of sector characteristics relevant to the review. This section should be concise and focused on information relevant to the review.

- **Major progress and remaining challenges since the last public expenditure review.** Acknowledge the client's reform efforts and achievements, identify why some recommendations have not been implemented, and flag persistent challenges.

- **Objectives and scope of this review.** Define the review's objectives and scope, including the key policy questions that it addresses. Give the reasons for excluding any important subsectors or topics, and assess how these exclusions might affect a comprehensive analysis of the sector's financing.

- **Data sources and analytic methods.** Describe data sources (see ⬭ **Technical Notes 1–6**) and analytic methods. This section should also address any challenges related to data availability and quality. ⬭ **Example 2: Data sources**

Overview of the education system

An overview of the education system should be presented at the outset to provide basic information about the system and to set the context.

- A diagram of the structure of the country's education system helps the review team and readers of the completed review understand how it is organized.

  - ▷ **Structure.** Levels of education by grade and official ages for each grade and level. What are the government's policies on multiple shifts and multi-grade?

  - ▷ **Flows (pathways) among levels and types of education.** Allowable pathways usually have implications for equity, efficiency, and learning outcomes. For example, students may not be allowed to enter university from an upper-secondary vocational education program.

  - ▷ **Type of schools.** What types of education providers manage schools? Schools include public, private (financially dependent on the government), private (privately managed without government financing), and religious. Private providers can include nonprofit entities such as non-governmental organizations, or for-profit groups.

- Does the education system require private school students to take the same examinations as public school students? How bureaucratically easy or difficult is it for private providers to go into business? Does the state have policies to let private providers access capital more easily?

- The overview should provide basic educational statistics (see ⬤ **Technical Note 7: Definitions and notes on indicators**). Internationally comparable indicators are available in **World Bank EdStats** (see ⬤ **Technical Note 4: Cross-national data**). Relevant statistics include:

  ▷ Number of schools by level, location, and type
  ▷ Number of students in school by level, gender, school location, and school type
  ▷ Net enrollment rate (NER) by level; if this rate is not available, gross enrollment rate (GER) by level
  ▷ Number of out-of-school children
  ▷ Dropout rate by grade
  ▷ Repetition rate by grade

Section 2	Overview of Education Financing and Spending

Key Question 1: Who finances education and how are funds channeled?

Education funds can come from government or non-governmental and external sources, and can be channeled through a variety of agents to a broad range of education providers. It is essential to review overall education spending by financing sources, which may include not only public funding, but also private and donor funding. Public expenditure reviews traditionally have not examined the revenue side of the education budget, but it is important to explore how countries raise revenues to finance education. Public funding may be raised at central and local government levels, as well as at the school level.

Consider creating a flow chart of financing sources and channels. Policies on fiscal decentralization and school autonomy, together with intergovernmental financing arrangements, define how education funding is channeled down to schools or generated at the school level. These policies can also result in horizontal and vertical imbalances,[7] and define how much of education spending is discretionary at each level of government and at the school level. The central government may allocate the education budget to local governments conditionally or unconditionally, based on a transparent methodology or based on negotiation. Schools may or may not have autonomy over budget. Private funding can account for a significant portion of education funding, typically at preschool and tertiary education levels, often at the secondary level, and sometimes for technical and vocational programs. Household surveys can be used to estimate families' education expenditures. Donor funding may play an important role in financing education in some countries. It could be integrated into the government budget or be off-budget.

- How much is spent on education in total, and who finances it, i.e., public, private, or international sources?
    - 🔴 **Technical Note 8: Definition of source of funds**
    - 🔵 **Example 3: Analysis of source of funds**

- How does the government raise revenues to finance education?
    - ▷ At the national level, which sources generate revenues for the national education budget by law (e.g., general revenue or taxes, profits from natural resources, profits from nationalized industries, revenue from lottery, dedicated sources, stabilization funds)?
    - ▷ Do local governments raise revenues, or are all taxes collected by the central government?
        - 🔵 **Example 4: Analysis of revenue sources**

- Which levels of government finance education?
    - ▷ If financing is split between the central and subnational levels, which levels of government pay for what? Local governments may fund certain levels of education, such as preschool and basic education, but not upper secondary education. They may fund certain inputs, such as school maintenance, but not capital expenditures.
        - 🔵 **Example 5: Analysis of decentralized financing**

▷ Are there fiscal transfers from the central government to local governments for financing education?

- Are these grants earmarked for education or unconditional—i.e., local government can spend the money as it wishes and, in theory, could decide to use none of it on education?
- How are the grants calculated?
- Is there evidence of vertical imbalances?
- Is there evidence of horizontal fiscal imbalances? If so, do they emerge from variations in

Example 6: Analysis of education financing by level of government and intergovernmental fiscal transfers

- Do schools receive grants? If yes, how are they allocated? How are allocation formulae defined?

- Do schools charge parents fees for school? What types of school fees are charged at the primary and secondary levels?

  Technical Note 9: School fees and other informal payments

- Are schools allowed to keep school-generated revenues, such as fees or revenues from entrepreneurial activities, the sale of products in vocational schools, or the rental of school space? For what purposes can public schools use private or international revenues?

  Example 7: Analysis of school budget by financing source

- How much do households with children in school spend on their schooling and for what goods and services? What share of their expenditures consists of mandatory payments (e.g., tuition fees) versus voluntary spending?

  Example 8: Analysis of household surveys on private spending

- Do households receive cash transfers, including vouchers to attend private schools?

- Does the private sector, or do other actors, contribute to education spending, e.g., co-financing technical and vocational education and training, or cash transfers to households?

- How much do international actors finance education? What is the nature of this spending? How dependent is the government on donors?

  Example 9: Analysis of donor funding

Key Question 2: How much does the government spend and on what?

Rationale for public intervention in the education sector

The public expenditure review must scrutinize and justify public intervention in the education sector. Assessments of the following issues should be a subtext of your report:

• Proponents of government intervention in education cite a need to ensure equity and efficiency in the sector. The public sector has an equity role because markets generally fail to ensure equal opportunities for all citizens—and, in fact, often create inequities. The efficiency concerns emerge from market failures and imperfections that are commonly associated with information asymmetries,[8] externalities,[9] and economies of scale.

• Government involvement can include regulation, the provision of information, financing, and service provision. Although the government always has regulatory and information-dissemination roles, and is almost always involved in financing education, it does not have to provide such services themselves to ensure equitable access and quality programs. In fact, if the private or nonprofit sector provides education to the country's standards at lower cost, the government may better serve consumers of education services by subsidizing the consumers, the non-public providers, or both.

• Opponents of public intervention in education cite governments' failure to meet the goals of such intervention or to ensure sustainable financing. Worse, critics say, the governmental involvement can crowd out potentially efficient and equitable private investment and activity.

• Where government should intervene, the key challenge is to find ways to prevent failure due to bureaucratic inefficiency, rent-seeking,[10] elite capture,[11] and other abuses.

Overview of public spending on education

The public expenditure review first analyzes public spending on education at the aggregate level. What is the total public expenditure on education? As a percentage of gross domestic product (GDP)? As a share of total public expenditure?

• Work with the consolidated budget (central government and local government budgets).

• Check for off-budget expenditures.

• Work only with executed budgets for the past fiscal years because planned is not executed. If you cannot access recent data for executed budgets and decide to include the preliminary figures, clearly label them as preliminary.

• Use real expenditures as opposed to nominal ones if you want to track annual percentage changes in the public funds flowing into the sector.

    ● **Technical Note 10: Calculating the share of a nation's resources going to education**
    ● **Example 10: Analysis of total public education expenditure**

Public spending on education can be broken down by functional, economic, administrative (organization), and program classifications.¹²

Functional classification. A functional classification of expenses organizes government activities according to the socioeconomic objectives that policymakers want to achieve through various kinds of expenditure. Many, but not all, countries adopt the internationally comparable Classification of Functions of Government (COFOG). This classification follows the level categories of the 1997 International Standard Classification of Education (ISCED-97) of the United Nations Educational, Scientific and Cultural Organization (UNESCO). The UNESCO document breaks down education levels into pre-primary and primary, secondary, postsecondary non-tertiary, tertiary, education not definable by level, subsidiary services to education, R&D education, and education services not-elsewhere-classified (or n.e.c.), such as administration, operation, or support of activities. Note that in countries that have not adopted the Classification of Functions of Government, subsectors may be defined differently. Even in countries that have adopted the classification, the length of a given education program, such as primary education, may vary.

- Look for anomalies, such as a disproportionate financing share for tertiary education relative to basic education.
  - ⬤ **Example 11: Analysis of education spending by functional classification**

- Calculate the public expenditure per student as a percentage of per capita gross domestic product (GDP), by level of education?

Functional classifications are also useful in analyzing the allocation of resources among sectors. The review should explore if marginal investments in other sectors can help to further education goals. For example, investing in rural roads or improved access to clean water can help to address barriers preventing girls from attending school, and may have more effect on school enrollment at less cost than direct investments in the education sector. If funding for human capital development—e.g., for technical and vocational education and training programs—is dispersed across sectors, other ministries besides the Ministry of Education may provide better value for money.

Economic classification. The economic classification of expense identifies the types of expense incurred according to the economic process involved. It includes compensation of employees (wages and salaries and employers' social contributions), use of goods and services, consumption of fixed capital, interest, subsidies, grants, social benefits, and other expenses.

- Consider how education expenditure is allocated by economic factors, such as capital versus recurrent expenditures; staff compensation versus non-staff recurrent expenditures; expenditures spent on teachers versus non-teaching staff?
  - ⬤ **Example 12: Analysis of education spending by economic classification**

- Be alert to important complementarities among inputs. The educational effectiveness of certain inputs depends on the simultaneous provision of other inputs. Thus, classrooms need teachers; teachers need textbooks. Not infrequently, wages and benefits for labor in the sector crowd out recurrent expenditures for items such as textbooks and other learning materials or infrastructure

maintenance. Capital investments can be paltry relative to the additional school seats required due to increased enrollment in an education subsector. Capital investments can be misallocated among education subsectors. For example, heavy capital investments to build new university campuses can starve the capital budget needed for pre-tertiary education. For vocational education and training, it is important to check whether the budget covers the costs of regular upgrades of workshops and equipment.

    ▷ Are salaries crowding out the non-salary recurrent budget?

    ▷ How much is available for routine maintenance per school? How adequate is this amount, compared with estimates of the costs of routine maintenance for the average school?

    ▷ Considering the government's textbook policy, is an adequate amount spent per child on textbooks?[13]

    ▷ Are teachers given incentives tied to performance and services?

Administrative (organizational) classification. The administrative classification identifies the entity that is responsible for managing the public funds concerned. Public education budgets may be spent by various ministries, different levels of governments, as well as on- and off-budget.

- Figure out which levels of government are responsible for spending resources on education. This question is different from who finances education. For instance, the central government may transfer (finance) education block grants to local governments, but the latter is responsible for spending the block grants.

- Check the budgets of all ministries that might have education expenditures for all types and levels of education addressed by the public expenditure review. For example, sometimes the budget for early childhood education falls under a ministry responsible for the welfare of women and families. All, or some, of the budget for vocational education and training may come under the Ministry for Labor.

Program classification. The program classification gives detailed costs of every activity or program that is to be carried out together with objectives and expected results of a proposed program. Reports on program-based budget execution provide extremely useful data on the extent to which education policies and plans have been successful, and they can stimulate policy changes and in-year course corrections. However, this type of budgeting requires strong expenditure tracking, monitoring, and accountability arrangements that are often not in place in our client countries. Transitioning to a program-based budgeting system not only requires improvements in the government accounting system, but also a shift in internal controls and a shift in accountability from inputs to program outputs.

- Are the expected outputs and outcomes specified for each program?

- Is the government accounting system capable of providing data on budget execution by programs and sub-programs?

- Are the data on actual outputs and outcomes achieved credible?

- Do budget-holders and implementers have the flexibility to reallocate among budgetary items in order to achieve expected outputs and outcomes?

Section 3	Financial Accountability

Key Question 3: Is the public financial management system set up to enhance financial accountability?

Effective systems of public financial management (PFM) can contribute to providing better inputs and improving accountability. The *World Development Report 2004*[14] stressed that better public financial management can ease several key challenges facing the education sector, including inequitable access, dysfunctional schools, low quality of instruction, low client responsiveness, and stagnant productivity. More recently, the World Bank Group's *Education Strategy 2020* (2015) recognized the important link between better public financial management and improved service delivery outcomes. For instance, equitable allocation of resources can help improve access to education for the poorest families; performance-based incentives can motivate teachers; and efficient spending can lead to savings that can, in turn, help pay for improvements in the learning environment. While theoretical links between improved public financial management processes and service delivery outcomes are well established, empirical evidence has been more limited in terms of when, and how, such reforms might contribute to better services (Welham et al. 2013; World Bank 2012). A number of country examples show strong links between education outcomes and public financial management improvements, but the evidence remains circumstantial.[15]

A range of public financial management analyses is available to help users assess whether such a system established for the education sector is successful in ensuring that government-earmarked funds are spent on policies as intended. These analyses include the overall Public Expenditure and Financial Accountability (PEFA) Framework,[16] sector-level assessments such as SABER School Finance, Public Expenditure Tracking Surveys (PETS), Quantitative Service Delivery Surveys (QSDS), Service Delivery Indicators (SDI) surveys, project fiduciary assessments, and audit reports. The PEFA Framework is helpful in identifying common public financial management issues across sectors. Sector-level and project fiduciary assessments would provide more details on how issues involving public financial management systems specifically affect the implementation of the education program. Internal and external audit reports of the education sector and a walk-through of public financial management processes—all critical business processes related to management and use of funds and assets—could help identify potential weaknesses in these processes.

● Technical Note 11: Public expenditure and financial accountability (PEFA) country reports
● Technical Note 12: Public Expenditure Tracking Surveys (PETS), Quantitative Service Delivery Surveys (QSDS), and Service Delivery Indicators (SDI)

The public expenditure review team should use a three-dimensional approach to analyze potential public financial management weaknesses underlying spending problems, as appropriate . Public financial management laws, policies, and procedures determine and regulate the behavior of public officials and organizations implementing them (Allen et al. 2013). Where laws and procedures are sufficiently appropriate but practices lag, it is also necessary to consider the capacity of actors who implement these laws, and the process through which the actors bargain over the design and implementation of policies within a specific institutional setting (World Bank 2017). A three-dimensional approach to a public financial management analysis considers the following factors:

(i) **Public financial management legal framework—the adequacy of laws, policies, and procedures.** What are the shortcomings and how do these affect education sector spending? Are these laws, policies, and procedures complied with? What are the key reasons for any deviations in both public financial management processes and outputs? Are certain political economy factors at play? Why do oversight agencies fail to pick up these deviations?

(ii) **Public financial management capacity—capacities at central and decentralized levels.** What public financial management training and reform mechanisms are in place at the country level and specifically in the education sector? How well does the Financial Management Information System enable the implementation of the public financial management legal framework?

(iii) **Institutional setup—who does what and the mapping of public financial management roles of central ministries, decentralized agencies, and other factors.** Are financial and transaction authority adequately delegated? What role and impact do civil society, unions, media, and the international community have as pressure groups to influence policy formulation and program implementation? Map the impact of institutional and individual actors' interests on public financial management.

Every spending problem is likely to have a unique set of underlying weaknesses in the public financial management process. Linking such weaknesses to key spending problems can be extremely useful in stimulating necessary reforms. How do public financial management processes, such as budget release, funds flow, and internal controls, apply to each of the main spending problems? What do the links between PFM arrangements and sectoral spending problems imply about the reforms needed? For example, textbook purchases generally require a one-off bulk procurement followed by a logistics process of distributing books from central level to schools. Schools then reuse these books over several years. In contrast, school grants do not require a bulk procurement or logistics involving physical assets. However, the issuance of such grants often entails a long (and often complex) funds-flow from central- or provincial-level governments to schools—with the process then relying more on local accountability mechanisms to ensure the funds' effective use. Table 3 summarizes major spending problems and potential underlying weaknesses in the public financial management system.

⬤ **Example 13: Issues related to budget formation and execution**

Table 3: Major spending problems and potential underlying PFM weaknesses

Spending problem	Potential public financial management weaknesses
Disconnect between the education policy intent and implementation	• Financial and human resource data are not used for policy- and decision-making. • Sector plans do not define institutional responsibilities for different levels of the government for each programs and subprogram. • The government budgeting and accounting system does not track program and subprogram expenditures due to several system and capacity issues, including challenges in apportioning joint costs over multiple (sub)programs. • The central government (Ministries of Finance and Education) has limited authority over, or capacity to handle, the implementation of sector plans to influence decisions made at subnational and local levels. • There is limited or no incentives or accountability linked to results at subnational and local levels. • Budget-holders who are responsible for the best use of the available budget and implementers have limited flexibility to reallocate the budget among input categories for mid-year course corrections. • Delayed budget releases and mid-year cash rationing with cumbersome funds flow (including of school grants) to lower levels are holding up non-salary and capital expenditures. • Weak procurement and internal controls result in delayed or cancelled implementation of activities.
Inadequate budget allocation	• Links are weak among target outputs, outcomes, and the budgets allocated. • The multi-year sector plan does not adequately cost out stated education policies or medium-term strategic plans. • Education resources are diverted to other functions due to weaknesses in the chart of accounts or lack of transparency in financial reporting. • The sector has budget arrears. • The sector plan has not fully integrated donor-financed projects.
Inequitable budget allocation	• Block grants to subnational and local governments are inadequate for equalizing fiscal imbalances among the localities (i.e. horizontal equalization). • Education spending results in disproportionate allocations to poor and vulnerable students.
Poor human resource management	• Delays in receiving salaries lower the motivation of teachers. • Lack of hardship incentives limits teacher deployment to rural or remote areas. • Weak, or lack of, management system for leave record leads to inadequate docking of salaries for absenteeism.

(Table continued on next page)

Spending Problem	Potential public financial management weaknesses
	• Sanctions and other action in response to audit findings are limited, even in cases of repetitive or permanent absenteeism. • Lack of independent oversight of teacher attendance increases the possibility of collusion with school directors and district education staff. • Internal and external auditors, monitors, inspectors, and supervisors apply duplicate and document-based controls in an uncoordinated manner, with no, or minimal, unannounced physical checks. • Personnel and payroll records for public servants in the education sector are not reconciled regularly to account for a possible difference between the two. • School directors or teachers cannot perform their duties in school because they are assigned to administrative functions at the district level or are given political party duties. • Teacher unions are politicized and represent a significant pressure group.
Lack of school autonomy	• School directors' inability to make independent decisions about hiring temporary teachers results in an inadequate or excess supply of teachers. • School councils are not sufficiently empowered to participate in decisions on the use of school grants, or to monitor teacher attendance. • School councils have no, or limited, involvement in monitoring school performance.
Insufficient and/or delayed availability of teaching and learning materials	• Procurement of textbooks, which is often centralized, is delayed. • Storage and distribution logistics are poorly managed, resulting in pilferage of textbooks. • Controls and incentives that encourage the reuse of textbooks over several years are limited. • Teaching materials are often procured locally, but lengthy and cumbersome procurement procedures apply. • Delays take place in the receipt of school grants.
Poor school infrastructure	• Budget allocation is inadequate for ongoing or planned construction projects. • School construction is not completed as planned, with no return on capital investment, and with exposure to rapid deterioration and cost escalations. • Politicized allocation of funds to schools leads to suboptimal regional coverage. • Inadequate technical supervision by the public works staff leads to poor construction quality. • Funding for school maintenance is inadequate and responsibilities are unclear. • To simplify contracting, authorities use expensive, standard school-building designs countrywide, instead of applying climate-suitable adaptations.

Spending Problem	Potential public financial management weaknesses
Over-reliance on public provision	• Policy and capacity to regulate and support private schools (e.g. grants, access to finance) are inadequate, not transparent, and not predictable in a way that would incentivize them to provide good services. • Private schools lack accounting capacity. • Regulatory authorities for private schools engage in limited coordination with the Ministry of Education.

| Section 4 | Adequacy and Sustainability |

Key Question 4: Relative to the government's policies and standards, how much is needed now (adequacy), and what can be afforded in the medium and long term (sustainability)?

Although international and regional benchmarks are useful in terms of advocacy and cross-country analyses, the adequacy of the budget for a specific country must be carefully assessed. The Third International Conference on Financing for Development (in Addis Ababa, July 2015)[17] set the following international benchmarks for education spending: at least 4 percent to 6 percent of gross domestic product (GDP), and at least 15 percent to 20 percent of total public expenditure to the education sector. Worldwide, the former target has been met, but not the latter: In 2012, countries, on average, allocated 5.0 percent of GDP and 13.7 percent of public expenditure to education (UNESCO 2015c). However, benchmarking should be used cautiously because many factors affect total expenditure in the sector, such as the government's financial capacity, demography, enrollment rates by subsector, quality and prices of basic inputs, geographical challenges, and policies on public versus private financing. A comparison with neighboring countries may be helpful, but regional neighbors may share the same difficulties as the country in question, and hence, may not be appropriate benchmarks.

Two other concepts are useful for measuring the adequacy of education spending. Countries have different education goals and standards, and their cost of achieving them will vary, independent of price differences. In the short term, adequacy can be measured relative to the costs of the inputs required, if the country meets its own provision standards for monetary and non-monetary inputs. These standards include those governing unit cost per student, teacher compensation, and the ratios of students to teachers, classrooms, or textbooks. Detailed descriptions of inputs are discussed below. The second concept for measuring adequacy is obvious shortfalls, as evidenced by arrears in the sector or inadequate expenditures on inputs complementary to teachers, such as teaching and learning materials, school maintenance, and needed capital expenditures. Teacher compensation is typically the largest expense in the education sector, and personnel costs are often met by underfinancing non-salary expenses.

Key input indicators

Besides macro indicators such as education spending as a percent of GDP and of total public spending, the adequacy of monetary inputs can be measured in two ways. One way is to calculate per student spending as a percentage of per capita gross domestic product (GDP), by level of education for public and private schools. The second way is to measure variations in per student spending among subnational units or schools and between public and private schools. Use comparative data to get some sense of whether, as indicated by costs, the country's provision of inputs—on average and as they are distributed across schools—is "out of range," either in terms

of apparent over-provision or under-provision. Since country- and sector-specific conditions affect allocations among differently priced inputs, comparisons can only flag if there might be a question to answer. Several different ways are available to compute per student spending, or unit costs.

- **Technical Note 13: Definitions and notes on monetary-input indicators**
- **Technical Note 14: Calculating unit costs from aggregate and itemized spending**
- **Technical Note 15: Calculating unit costs when the country's fiscal year and school year do not coincide**
- **Example 14: Analysis of per student spending**
- **Example 15: Minimum norms and standards for resource allocation**
- **Example 16: Analysis of cost of teachers**

The adequacy of non-monetary inputs (human resources, classrooms, and infrastructure) can be measured by scrutinizing government standards and by assessing their actual provision. Governments, including the Ministry of Education and sometimes parliamentarians, set standards governing inputs to education. These include standards for where to build new schools relative to population settlements, construction designs and standards, student-classroom ratios, student-teacher ratios, student-textbook ratios, annual hours of teacher training, annual instructional time overall and per subject, annual duration of schooling, and so forth. However, actual provision of inputs may or may not meet those standards. Therefore, it is important to examine both standards and actual provision, and identify whether either, or possibly both, may be inadequate to deliver quality educational services. Both are problems that PERs can address, but their solutions differ. The former requires changes in policies that define standards; the latter, changes in how inputs are distributed. Obtain information on input standards by interviewing the Ministry's policymakers or the senior technical staff, backed by relevant policy documents. Data on actual provision of inputs should be disaggregated by level of education or grade (whichever appropriate) and by region, district, and school (using the smallest unit for which data are available), within a country. They should also be compared over time within the country, and with data for comparator countries.

- **Technical Note 16: Definitions and notes on non-monetary input indicators**
- **Technical Note 17: Definitions and notes on research indicators**

Check these aspects of the three main types of non-monetary inputs:

- **Human resources**
  - ▷ Student-teacher ratios
  - ▷ Percentage of qualified teachers
  - ▷ Ratio of teachers to non-teaching staff
  - ▷ Non-teaching staff per type of school
  - ▷ Organization of teachers' working time
  - **Example 17: Analysis of teacher distribution**

- **Classroom inputs**
  - ▷ Average class size
  - ▷ Student-textbook ratios for core subjects
  - ▷ Percentage of schools meeting minimum standards requirements for educational inputs
  - ▷ Annual instructional time
  - ⬤ **Technical Note 18: Efficiency of the curriculum**

- **Infrastructure**
  - ▷ Average school size (number of students per school)
  - ▷ Unit cost of building a classroom
  - ▷ Standards and schedule for infrastructure maintenance
  - ▷ Percentage of schools that run double and triple shifts
  - ▷ Percentage of schools that use multigrade classrooms
  - ▷ Percentage of schools meeting minimum standards requirements for learning conditions

Comparing the projected costs of education with the anticipated size of the resource envelope can shed light on whether planned spending levels are realistic. Beyond considering how much is needed now, it is essential to examine what happens to costs in the medium and longer term, given the government's sectoral goals, demographic projections for the school-age population, assumptions about enrollment rates by level, and macroeconomic and budget forecasts. Projected costs of education provision are often spelled out in the Medium-term Expenditure Framework (MTEF). If the country does not have such a framework in place, a costing exercise will be required.

⬤ **Example 18: Cost projections**
⬤ **Example 19: Fiscal sustainability analysis**

- **Sectoral goals.** Medium- to long-term education goals and targets may include extending the length of compulsory education, increasing education access for the poor, hiring more qualified and, thus, expensive teachers, converting community teachers to regular teachers, introducing computer-assisted instruction, retrofitting facilities to protect against earthquakes, expanding vocational education and training, and introducing cost recovery for tertiary education. It is essential to examine whether these goals are fiscally feasible.

- **Country's demographic structure and trends, including urbanization, and projected enrollment rates by subsectors.** Rapid urbanization can increase future enrollment rates. What do the trends in the school-age population and assumptions about trends in enrollment rates by subsector imply about the inputs required now and in future?
  - ⬤ **Technical Note 19: Demographic trends and enrollment projections**
  - ⬤ **Example 20: Demographic trends and enrollment projections**

- **Country's macroeconomic projections and government's strategic priorities.** The former affect the total resource envelope available; the latter, the government's decision on how to allocate resources among different sectors.

If at all possible, do some simple modeling to assess what the joint implications are for projected costs and revenues and, thus, how realistic the government's plans are for the sector. For instance, UNESCO's Education Policy and Strategy Simulation Model (EPSSim) is a sector-wide and goals-based generic simulation model that is driven by demographic trends. Enrollment targets are taken as a priori and the simulation calculates the corresponding financial resource implications. The World Bank's Maquette for MDG Simulations (WB-MAMS) is a Computable General Equilibrium (CGE) model and can help assess the broad, economy-wide effects of alternative education scenarios. Be sure to work closely with the country economist or the macroeconomist on the public expenditure review team.

⬤ **Technical Note 20: UNESCO's Education Policy and Strategy Simulation Model (EPSSim)**
⬤ **Technical Note 21: Simulating the economy-wide effects of alternative education scenarios**

Section 5	Efficiency and Effectiveness

Key Question 5: Are public resources being used efficiently and effectively?

Resources are scarce, and an important purpose of any PER is determining value for money from education investments, regardless of their financing source. The purpose here is similar to the "value for money" (VfM) approach that the United Kingdom's Department for International Development (DfID) has adopted for making aid decisions;[18] that the World Bank has pursued for decades in its economic analyses of investments; and that studies such as cost-benefit and cost-effectiveness analyses and impact evaluations support. The basic value for money concept is that of obtaining the maximum benefit over time with the resources available. Value for money is high when an optimum balance exists among three elements: when costs of inputs are relatively low, productivity is high (or efficient), and successful outcomes have been achieved (or effective).[19]

It should be noted that efficiency and effectiveness are not the same. A service or good may be efficiently produced, but not effective. Similarly, it may be effective, but not efficiently produced. For example, a teacher-training program may produce a large number of graduates at a small cost, yielding an efficient cost-output ratio. However, if these teachers' classroom performances shows no discernible improvement, the training is efficient but ineffective. A student-to-qualified teacher ratio of 15/1 may result in learning gains. However, if increasing the ratio to 25/1 achieves the same learning gains, using qualified teachers is effective, but at the 15/1 ratio, inefficient.

Output and outcome data

To assess efficiency and effectiveness, we need input, output, and outcome data. Section 4 above defined monetary and non-monetary inputs. The primary output and outcome data needed are the following, including trend data for the PER country and comparative data:
⬤ **Technical Note 22: Definitions and notes on output and outcome indicators**

- Participation rates
    - ▷ Gross and net enrollment ratios by level of education
    - ▷ Dropout rate by grade
    - ▷ Repetition rate by grade
    - ▷ Completion rate for each educational program
- Learning outcomes for core subjects
    ⬤ **Technical Note 4: Cross-national data**
- Employment and wage rates by level of education
    - ▷ Labor force participation rate
    - ▷ Employmentandunemploymentrates

Several different types of economic efficiency analyses exist, but those most useful for education public expenditure reviews are analyses of allocative efficiency, technical efficiency, internal efficiency, and external efficiency.
⬤ **Technical Note 23: Concepts of effectiveness and efficiency**

Allocative efficiency

Allocative efficiency asks whether the sector is allocating its resources among subsectors "so as to maximize the welfare of the community." Section 2 asked for an analysis of how public expenditure is allocated among education levels or subsectors. Subsector allocations for the country undergoing a public expenditure review can differ for good or poor reasons from those of countries with which it is being compared. For example, the definitions of education levels can vary across countries. Eliminating school fees usually creates enrollment bulges that require high "catch-up" allocations to the newly "free" subsector. Significant success in obtaining high primary-completion rates usually translates into sharp spikes in demand for secondary school seats that then require major increases in capital budgets for the subsector. However, high and increasing expenditures for tertiary education may crowd out allocations for pre-tertiary-level programs—a trend that ultimately favors the children of wealthier families.

Assess the allocative efficiency of the standards themselves, independent of how well the public expenditure review country meets them, to separate inefficient objectives from inefficient implementation. As discussed in Section 4, the sector usually sets standards for inputs, such as student-teacher ratios, teacher compensation schedule, student-textbook ratios, and student-classroom ratios. Comparative data for these variables will reflect, not comparators' standards, but how comparators implement their own standards. However, these data will give some idea of reasonable ranges for standards in the country undergoing review.

Figure 4: Distribution of student-teacher ratios for primary schools in a province
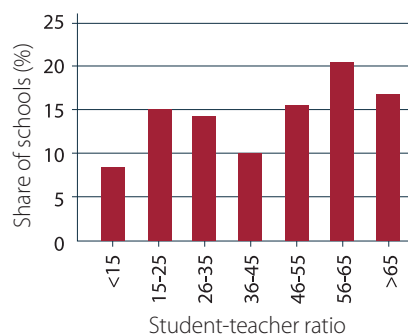
Note: A hypothetical example

Start with simple histograms to display the distribution of an input across regions, schools, or classrooms. Highly variable deployments of inputs always signal allocative inefficiencies. For example, if the sector standard for the student-teacher ratio in a primary class is 35 students per teacher, the hypothetical example in Figure 4 shows wide (but not unusual) variances in these ratios between schools—inherently and relative to the 35:1 standard. Completely aside from whether the standard itself is or is not reasonably efficient, the very uneven deployment of a key resource is inefficient (and inequitable). When significantly variable deployments are observed, the review must try to determine the sources of the variability.

Technical efficiency

The sector achieves value for money when it gets the best outcomes at least cost. This result can be achieved in either of two ways. The inputs used by a given intervention can be reduced to the minimum required to achieve the outcome sought. Or a different intervention can be used—one with a different combination of resources that achieves, at less cost, the outcome sought, as well as, or better than, the alternatives.

⬤ **Example 21: Technical efficiency of inputs (efficiency indicators)**

Analyses of technical efficiency look at costs, input mixes, and results. Cost-effectiveness analysis (CEA) relates monetary inputs and non-monetary outputs and outcomes. Cost-benefit analysis (CBA) is used when both the costs and the outcomes can be monetized. A public expenditure review is not usually expected to conduct either type of analysis. However, the review may use findings of international and in-country cost-effectiveness analysis and cost-benefit analysis to help identify instances of probable low value for money. For instance, in examining six recent systematic reviews or meta-analyses of interventions that improve learning outcomes in low- and middle-income countries, Evans and Popova (2015) observed a wide variation in conclusions across the studies, with much of the variation driven by variation within categories of interventions. Thus, the specific details of the intervention determined its effectiveness. Based on a careful examination of the details of interventions in the six studies, they identified three categories of interventions that were broadly supported across the studies: "(i) pedagogical interventions that match teaching to student's learning, including through the use of computers or technology; (ii) individualized, long-term teacher training; and (iii) accountability-boosting interventions, such as teacher performance incentives and contract teachers" (Evans and Popova 2015, 3). These findings may help the PER team identify a potentially inefficient area that the sector is strongly advised to investigate.

⬤ **Technical Note 24: Cost-effectiveness analysis**
⬤ **Example 22: Analysis of unit costs and outcomes**
⬤ **Technical Note 25: Cost-benefit analysis**
⬤ **Example 23: Cost-benefit analysis**

Use cost data to sense whether the sector may be overpaying for an input relative to the value obtained. Especially relevant data are costs of teachers relative to in-country comparators, costs of textbooks relative to comparators, and in-country variations in unit costs for classroom construction. For example, private school teachers may be considerably cheaper than public school teachers. If learning outcomes in private schools are similar to, or better than, those in public schools, controlling on family socioeconomic status (SES), the sector may want to consider shifting more provision of education to the private sector via vouchers or subsidies. Significant in-country variations in unit costs for classroom construction also raise questions about value for money. Theunynck (2009) finds that the most efficient designs are ones that can be mass produced at low cost on the local market, using small- and medium-size enterprises in the formal and informal sectors. He also alerts us to the fact that alternative procurement and contract management arrangements differ in their cost-effectiveness.

A relatively complex analytic technique called data envelopment analysis (DEA) can be used to measure the efficiency of multiple service delivery units by comparing the mix and volume of resources used (inputs) and services provided (outcomes) by each unit. DEA is a linear programming methodology. The techniques can be used to define and estimate efficiency as the distance from the observed input-output combinations to an efficient frontier, which is the maximum attainable output for a given input level. It is often used to compare countries relative to an efficiency frontier. For example, for a large panel of countries, total government education expenditures as a percent of GDP (or GNI) can be plotted against different education outcomes, such as primary completion rates, enrollment rates, or learning outcomes.[20]

⬤ **Example 24: Data envelopment analysis**

Internal efficiency[21]

Internal efficiency measures the percentage of children who complete an educational cycle (e.g., primary education or lower secondary education) as a share of those who start the cycle or as a percentage of those who finish the cycle in the minimum number of years. The first definition allows the calculation of the dropout rate—i.e., the number of those who start minus the number who ultimately complete, as a share of those who start. The second definition measures the dropout rate plus the repetition rate. If the data show either relatively high dropout rates, high repetition rates, or both, the sector has an expensive internal-efficiency problem. Dropping out imposes costs on individuals and countries in the form of unrealized human capital. Repetition imposes costs on the sector in the form of its having to pay double (or triple) the unit cost of a year of school per repeater. In cases of significant internal inefficiency, the difference between unit costs per completer of an education program and unit costs per student who completes the program without interruption are better measures of costs than unit costs.

⬤ **Technical Note 26: Calculating the budget costs of one completer and of one uninterrupted completer**

⬤ **Example 25: Internal efficiency indicators**

External efficiency[22]

External efficiency measures the returns to individuals, employers, and the country of public and private investments in education. It depends on a match between the type and quality of skills and knowledge that school leavers acquire in school relative to the skills and knowledge needed and paid for by employers. Does education improve the employability and wages of school leavers? Does public investment in education and training contribute to the country's growth and economic development? Measuring and linking employment and wage returns to education is particularly important for vocational education and training, and tertiary education.

⬤ **Technical Note 27: Estimating private rates of return to education**

⬤ **Example 26: Rate of returns to education**

Section 6	Equity

Key Question 6: Does public spending promote equity?

A fundamental responsibility of the state is ensuring equity and managing redistribution. Public policy, including educational finance policy, can help minimize subgroup differences in educational access and achievement. This section explores: (i) how to identify inequity, if any; (ii) whether, and how, the government spends its budget to promote equity in education; and (iii) how households are responding to public policies and filling the funding gap between their needs and public spending.

Equity in education financing can be assessed in terms of two main principles: horizontal and vertical equity.

> **Horizontal equity** is defined as the equal treatment of equals and is used to justify similar levels of funding across comparable schools or subnational divisions. Accordingly, a mechanism may operate to equalize education spending across subnational divisions to preserve fiscal neutrality, so that the amount of available resources for education is not positively correlated with the wealth of where a student lives.

> **Vertical equity** supports the unequal treatment of "unequals" (Underwood 1995). For example, progressive spending may be necessary to provide equivalent education to students whose native language is different than the language of instruction or to students with special education needs. Other examples include targeted support programs (such as conditional cash transfers and scholarships), or student weights to differentiate spending for certain types of students.

Vertical and horizontal equity have a special meaning in tertiary education. According to Salmi and Bassett (2012):

> The **vertical** dimension looks at who enters tertiary education and who graduates from tertiary education.

> The **horizontal** dimension looks at what kind of institution they attend, and what labor market opportunities are offered to graduates with various types of qualifications and levels of degrees.

The first analytical step is to diagnose the country's trends related to equity in education. Disparities in access to education, completion, and learning achievements across different student groups indicate existing problems of inequity in education.

- How do school enrollment rates, completion rates, and learning outcomes vary by gender, household income, geographical location, and ethnic or religious group?
  - 🔵 **Example 27: Analysis of inequity**

- Do the data assembled for Section 4 on the distribution of inputs by school, district, or region indicate substantial variation among geographical areas in terms of children's opportunities to learn?

- What is public spending per student by level of education, subnational division, school type, and student group (e.g., geographical location, income quintile, gender, ethnicity, language, religion, and special needs)?
  - 🔴 **Technical Note 28: Per capita financing**
  - 🔵 **Example 28: Analysis of per capita financing**

The second step is to examine what role the state plays in mitigating or exacerbating inequity.

- What demand-side and supply-side financial interventions does the government adopt to promote equity? The most common programs that address equity include:

  - ▷ **Demand-oriented interventions**, such as conditional cash transfers, school feeding, vouchers, scholarships or student loans, universal and targeted child benefits, and full or partial subsidies for school supplies, transport, and boarding
    - 🔴 **Technical Note 29: Targeting mechanisms, coverage, and depth of programs**
    - 🔵 **Example 29: Analysis of cash transfer programs**

  - ▷ **Supply-oriented interventions**, such as an expansion of the education system to reach the poor, and the provision of additional funding for disadvantaged students[23]

- How progressive or regressive is the state's financing of education?
  - ▷ What are benefit incidences across different groups of households?
    - 🔴 **Technical Note 30: Benefit incidence analysis**
    - 🔵 **Example 30: Benefit incidence analysis**

- What actions other than financing does the government take to increase parental demand for education? If parents fear for their daughters' safety during travel to school, does the government implement measures aimed at protecting girls? For families speaking a minority language, does the government publish textbooks and provide teachers who offer instruction in that language?[24]

- Does the state finance private education through partial or full subsidies to providers or consumers? What are the rules governing these subsidies? For example, what percentage of the estimated per student cost for public schools does a subsidized private school receive? Can a private school receiving public subsidies also charge fees? Depending on how they are designed, public subsidies may implicitly subsidize the wealthy's preference for private education.
  - 🔴 **Technical Note 31: Subsidies**

- Are there corrupt practices that affect access, grades, or graduation—e.g., bribes to university faculty to secure entry into a particular department, or parental "gifts," such as new computers, given to gain admission to a prestigious secondary school?[25] If so, how widespread are these practices? Has the state taken any actions to stop them? Does the state regulate the practice of the student's teachers, or teachers within the student's school, providing private lessons to the student? Bribes, gifts, and private lessons penalize the poor.

- What public policies govern students' progression through the educational system? If tertiary enrollments are rationed, examinations during the pre-tertiary years are often used to "weed" students out of the system. Pathways into tertiary education may be highly restricted. Students may have had to complete the academic program at the upper secondary level, and access to this program may be highly restricted, as well. Such policies favor wealthier families.

The third step is to analyze private spending. Use household survey data on households' education expenditures to assess whether educational disadvantages are related to private costs for education (financial barriers).

- What do families in different consumption quintiles pay for education by level of education as a percentage of their average consumption? Consider both formal and informal payments.
  ⬤ **Technical Note 9: School fees and other informal payments**
  ⬤ **Example 31: Analysis of private spending by income quintile**

TECHNICAL NOTES

⬤ Technical Note 1: Government's official documents

Government's official documents—such as policies, laws, and regulations that specify standards for inputs to, and financial arrangements for, the learning process—are necessary to differentiate policy intent and implementation. For discussion of inputs, see Section 4: Adequacy and Sustainability. The SABER-school finance data collection instrument[26] can provide a more detailed list, as needed.

⬤ Technical Note 2: Country system-level data

Data generated by country systems include: (i) government budget documents (central government consolidated accounts; Ministry of Education budgets; state or provincial budgets, if separate from consolidated government accounts; institution-level financing data; medium-term expenditure framework documents); (ii) education management information systems (EMIS); (iii) national learning assessments; and (iv) sector-specific databases, such as school mapping and teacher databases. It should be noted that data generated by country systems tend to be the most problematic and need to be treated with caution.

(i)   It is not easy to obtain reliable financing data from the government. Wherever possible, try to obtain data from the Ministry of Finance, instead of the Ministry of Education.

BOOST, a World Bank initiative launched in 2010, draws detailed government expenditure data from government financial management information systems and creates easy-to-use databases. The program strengthens public-expenditure policy outcomes and accountability by improving the quality of expenditure data, facilitating rigorous expenditure analysis, and improving fiscal transparency. Experience indicates that BOOST is most useful if the raw data from the Ministry of Finance is sufficiently disaggregated. The Governance Global Practice's BOOST team could support the public expenditure review team by creating an education module in an Excel format that combines expenditure data from the BOOST database with education statistics and other information on public institutions, service delivery, and households.[27] The ease of access to, and preparation of, analytical reports supports decision-making for the purposes of planning, budgeting, monitoring, and evaluation. BOOST often does not have expenditures by programs and sub-programs because governments typically do not have relevant disaggregated data.

In collaboration with the World Bank, more than 70 countries have developed a BOOST government budget database to date. If the counterpart does not yet have a BOOST, consider working with the Governance Global Practice and Macroeconomics and Fiscal Management (MFM) Global Practice colleagues to encourage the counterpart to develop a BOOST database. If the education public expenditure review is part of a comprehensive expenditure review, the Macroeconomics and Fiscal Management team is most likely to create a BOOST that the education team can then use. However, teams need to be aware that building a BOOST may take a long time. Also, BOOST tends to lack disaggregated data at the local level. If education functions and financing are decentralized, the education team may need to collect disaggregated data separately from local governments.

 (ii)   Especially in low-capacity countries, education management and information system (EMIS) data can be problematic in terms of validity and reliability, especially when it comes to recent data. The team needs to be alert to incentives in the system that encourage misreporting of the numbers. For example, per capita financing creates incentives to inflate enrollment numbers. In such cases, the public expenditure review team will have to triangulate among data sources to estimate values of school-specific variables, enrollment rates, or teacher absenteeism rates.

(iii)   Designing and administering a good learning assessment is quite technical. Although it is generally preferable on quality grounds to use well-established regional or international learning assessments, national learning assessments can meet technical design standards. Relative to cross-national learning assessments, they can also be better aligned with the country's curriculum. However, confer with the Bank's country education team on the technical quality of these assessments. In using the data, flag concerns raised by the Bank's team.

(iv)   The quality of other sector-specific databases, such as school mapping and personnel rosters, varies across countries. However, if they are of reasonable quality, they are a good source for determining the distribution of inputs relative to government standards—for example, infrastructure relative to population settlements, or teachers relative to student enrollments.

⬤ Technical Note 3: National surveys

National surveys measure variables important for PERs and can be a goldmine. For example, household consumption surveys are essential to creating poverty maps and to measuring household payments for education. Census data are essential for estimating changes in the size of school-age cohorts that the education system will have to accommodate. Labor force surveys can be used to estimate employment and wage returns to different levels of education or the educational attainment of the working-age population or active labor force.

Although the team needs to determine quirks and data-quality problems with any survey, the quality of national surveys tends to be adequate and may be excellent. The statistics unit of a country tends to conduct such surveys, although they may use internationally established frameworks and processes. Data are collected under the same protocol. The staffs of units conducting these surveys benefit from international experience with the design, administration, and analysis of such surveys. Donors also often fund technical assistance to help such units professionalize the conduct of the surveys under their jurisdiction.

Census data and reports. Country-specific estimates and projections can be checked with population experts in the Health, Nutrition, and Population Global Practice (HNPGP).

Household and other surveys. Household surveys usually collect data on enrollments and completion by level of education, age, gender, and residential location, and private spending on education. Country-specific survey data include the following common and highly developed sources:

•   **Living Standards Measurement Study (LSMS):** The LSMS is a household survey program housed within the Survey Unit of the World Bank's Development Data Group that provides technical assistance to national statistical offices in the design and implementation of multi-topic household

surveys. Since its inception in the early 1980s, the LSMS program has worked with dozens of statistics offices around the world: generating high-quality data, incorporating innovative technologies and improved survey methodologies, and building technical capacity.

- **The Skills Towards Employability and Productivity Program (STEP) program:** The World Bank's STEP measures skills in low- and middle-income countries. It provides policy-relevant data to enable a better understanding of skill requirements in the labor market; *backward* linkages among skills acquisition and educational achievement, personality, and social background; and *forward* linkages among skills acquisition and living standards, reductions in inequality and poverty, social inclusion, and economic growth. The STEP program includes a household-based survey and an employer-based survey. All relevant survey documentation is provided along with the datasets. The "STEP Methodology Note" presents key concepts and describes the STEP survey instruments. It also provides guidance on how to use the data.

- **Demographic and Health Surveys (DHS):** These nationally representative household surveys provide data on a wide range of monitoring and impact evaluation indicators in the areas of population, health, and nutrition. Education is a key background indicator in demographic and health surveys, which help contextualize a country's health and development situation.

- **Multiple Indicator Cluster Surveys (MICS):** UNICEF supports governments in carrying out these surveys through a global program of methodological research and technical assistance. Cluster survey findings have been used extensively as a basis for policy decisions and program interventions, and for the purpose of influencing public opinion on the situation of children and women around the world. All available results and datasets from these surveys can be accessed on **mics.unicef.org**. The results from the most recent **MICS-5 surveys**, carried out in 2012–15, are becoming progressively available. (MICS-6 was launched in October 2016. It will cover five of the household survey-based indicators for Sustainable Development Goal (SDG) 4, Education 2030.)[28]

- **EdStat's Education Equality:** Household surveys can provide detailed information on gender, income, and geographic inequalities in education access, progression, attainment, and expenditures. EdStats gives users access to household survey data through the following tools and resources:

  ▷ The **Education Equality Query** holds household survey data from DHS and MICS. Indicator names beginning with the labels "DHS" and "MICS" were generated by EdStats using the **ADePT Education tool**. Indicator names beginning with "UIS" were generated by the UNESCO Institute for Statistics (UIS) using its stated **methodology**. Variances may exist in data from differing sources based on methodological differences.

  ▷ **Education Equality Country Profiles** are detailed Excel file reports for all available DHS, MICS, and LSMS. They include a series of graphs and a wider variety of indicators than are currently available in the Education Equality Query.

  ▷ The **Education Equality Dashboard** is a data visualization tool that allows users to visualize disparities in attendance rates, completion rates, educational attainment, and out-of-school children.

▷ The **ADePT Education** tool allows users to derive education indicators from household survey data and create customized reports and graphs. The program contains built-in settings for DHS surveys, but also accepts other types of surveys, and determines automatically what tables can be built from the available data.

• **University of Oxford's Young Lives survey:** This survey includes a household questionnaire with special items focused on the children and a community questionnaire. It covers Ethiopia, India, Peru, and Vietnam. It is often complemented by a school survey and the collection of in-depth, qualitative longitudinal data on some of the children. The household survey collects data similar to the World Bank's Living Standards Measurement Study. These include information on household composition, livelihood and assets, household expenditure, children's health and access to basic services, and education. This is supplemented with additional questions about caregiver perceptions, attitudes, and aspirations for the children and the family. The Young Lives survey also collects detailed data on how all family members use their time, information about the children's weight and height (and similar information for caregivers), and data on children's learning outcomes (language comprehension and mathematics). It asks the children about their daily activities, their experiences, and attitudes towards work and school, their likes and dislikes, how they feel they are treated by other people, and their hopes and aspirations for the future. The community questionnaire provides background information about the social, economic, and environmental context of each community. It covers topics such as ethnicity, religion, economic activity and employment, infrastructure and services, political representation and community networks, crime, and environmental changes.

● Technical Note 4: Cross-national data

The two main types of cross-national data systems are international learning assessments and statistical databases that can show where a country sits within the range of practice.

In addition to national assessments of learning outcomes, check to see whether the country has participated in any of the international or regional learning assessments. **EdStats' Learning Outcome Dashboard/By Country** has a table of the assessments in which each country has participated. These assessments usually measure the gender composition and characteristics of the home that can serve as a proxy for socioeconomic status and sometimes other characteristics that indicate subgroup membership. Cross-national learning assessments also provide comparisons and tend to meet higher design standards and better-tested administration and data-cleaning procedures than national learning assessments.

- **Program for International Student Assessment (PISA)**

- **Trends in International Mathematics and Science Study (TIMSS) and Progress in International Reading Literacy Study (PIRLS)**

- **OECD's Programme for the International Assessment of Adult Competencies (PIAAC) and other adult literacy surveys**

- **Early Grade Reading Assessment (EGRA): Applications and Interventions to Improve Basic Literacy** and **Early Grade Mathematics Assessment (EGMA): A Conceptual Framework Based on Mathematics Skills Development in Children,** developed by the Research Triangle Institute (RTI)

- **Southern Africa Consortium for Monitoring of Education Quality (SACMEQ)**

- **Programme d'Analyse des Systèmes Educatifs des Pays de la CONFEMEN (PASEC), or the CONFEMEN Programme for the Analysis of Education Systems** (i.e., conference of education ministers for countries sharing the French language)

- **Laboratorio Latinoamericano de Evaluación de Calidad de la Educación (LLECE), or Latin American Laboratory for Evaluating the Quality of Education**

The quality of cross-national statistical databases is mixed.

- **OECD's annual *Education at a Glance*:** These OECD data are of high quality because of the exceptional processes in place that produce them.

- **UNESCO Institute of Statistics (UIS):** Although the Institute works persistently with governments to help them improve the quality of data generated by their education management information systems, it ultimately has to depend on country-specific data with all of their problems. As a result, the quality of Institute data is uneven.

- **World Development Indicators (WDI):** These are the World Bank's primary collection of development indicators, compiled from officially recognized international sources. They assemble the most current and accurate global development data available and include national, regional, and global estimates. Six themes are used to organize indicators: world view, people, environment, economy, states and markets, and global links. For education, the World Development Indicators cover five types of variables: education inputs (e.g., government expenditure per student, government expenditure on education as a percentage of GDP and as a percentage of total public expenditure, trained teachers, and student-teacher ratios); participation in education; education efficiency (e.g., cohort survival rates, repetition rates, transition rates); education completion and learning outcomes; and education gaps by income, gender, and area (country and region). The data sources for the first four types of variables are almost entirely from the UNESCO Institute of Statistics. As noted above, these must be used cautiously because the data depend on country-specific education management information systems (EMIS) data. The data for the fifth type (gaps by income and gender) depend heavily on demographic and health surveys, and multiple indicator cluster surveys.

- **World Bank EdStats (Education Statistics):** EdStats All Indicator Query holds more than 4,000 internationally comparable indicators that describe education access, progression, completion, literacy, teachers, population, and expenditures. The indicators cover the education cycle from pre-primary to vocational and tertiary education. Most EdStats data come from the UNESCO Institute of Statistics. EdStats also includes learning outcome data from international and regional learning assessments, equity data from household surveys, and projection and attainment data to 2050.

  ▷ **Education Expenditures:** Education-expenditure data reside in two databases on the EdStats website: (i) the EdStats Query–Education Expenditures; and (ii) the World Bank Education Expenditure Database, which has been created using data extracted from World Bank public expenditure review documents. Table TN1 summarizes the differences between the databases.

Table TN1: Education-expenditure data base

	EdStats Query Education Expenditures	**World Bank Education Expenditure Database**
Use of Database	Download core expenditure indicators and compare expenditure data across countries.	Download detailed expenditure data on one country. Data cannot be used to compare countries.
Number of Indicators	93	More than 800
Data Source	**UNESCO Institute for Statistics**	**World Bank PER Documents**[a]

a. The PER documents are available in http://datatopics.worldbank.org/education/wDataQuery/ExpBackground.aspx.

  ▷ **EdStats Dashboards:** The Key Education Indicators Dashboard presents a broad portrait of all levels of a selected country's education system from pre-primary to tertiary education. It includes gender, regional, and income-group comparisons.

  ▷ **The State of Education–Expenditure Dashboard:** The State of Education's Expenditure Dashboard presents a global view of education spending through dynamic maps, charts, and accompanying analysis. It presents not only key expenditure indicators such as government spending on education as a percentage of gross domestic product, but also the correlation between government spending and outputs such as enrollment rate and learning outcomes.

- **National Education Accounts (NEA):** This tool takes into account multiple education-financing data from different sources, including public, private, and donor funding, in a given country, and seeks to enable international comparisons of education financing (UNESCO 2015a). Drawing a complete picture of education financing in a given country does not necessarily allow international comparisons due to differences in budget classifications. To enable international comparisons, the National Education Accounts methodology (UNESCO Institute for Statistics, UNESCO International Institute for Educational Planning, and IIEP Pôle de Dakar 2016a and 2016b) has been developed on the principles of existing international standards, such as the System of National Accounts (SNA 2008), and the International Standard Classification of Education (ISCED 2011). Development of a National Education Account requires a careful matching of country and international classifications, and only a limited number of countries have implemented this tool to date. A long-term goal for the international education community is to enhance the use of this tool to enable international comparisons of education financing across countries.

- **World Economic Forum annual *Global Competitiveness Report*:** This report has survey data collected from employers in each country. Respondents identify barriers to doing business, including an inadequately educated labor force, and rate the quantity and quality of a number of human-capital measures.

- **World Bank's *Doing Business Survey*:** This survey is less useful for education than the World Economic Forum survey or the World Bank's Enterprise Survey. It sometimes assesses labor market regulation.

- **World Bank's *Enterprise Survey*:** An Enterprise Survey is a firm-level survey of a representative sample of an economy's private sector. The surveys cover a broad range of business-environment topics, including access to finance, corruption, infrastructure, crime, competition, labor, and performance measures. The labor module assesses the characteristics of the firm's employees (e.g., their educational attainment), the firm's labor policies (e.g., employee-training programs) and the employer's views of the extent to which inadequately trained workers constrain their business. Since 2005–06, more than 125,000 interviews in 139 countries have taken place under the Global Methodology. Enterprise Surveys implemented in Eastern Europe and Central Asian countries, conducted jointly with the European Bank for Reconstruction and Development, are also known as Business Environment and Enterprise Performance Surveys (BEEPS).

- **Transparency International:** This organization publishes data on perceived corruption by country. In 2013, it published an **analysis of the sources of corruption by level of education, including extensive treatment of corruption in higher education.**

● Technical Note 5: Research reports

Before starting a public expenditure review, be sure to scan for relevant research reports published by the World Bank, donor partners, non-governmental organizations (NGOs), or the international research community. The Bank's education public expenditure reviews tend to underuse the international evaluation literature, such as meta-analyses of rigorous evaluations of the effects of inputs on students' participation and learning outcomes (Glewwe et al. 2011; Snilstveit et al. 2016). These studies provide important data on the likely effectiveness of different investments and the conditions under which effectiveness occurs. As such, they are useful for public expenditure reviews' analyses of the efficiency and effectiveness of inputs. To locate studies, use these links:

- **World Bank research and publications:** Look for Systematic Country Diagnostics, Country Economic Memoranda, poverty assessments, earlier public expenditure reviews, Public Expenditure Tracking Surveys (PETS), Quantitative Service Delivery Surveys (QSDS), Service Delivery Indicators (SDI) (see ● **Technical Note 12** for details on PETS, QSDS and SDI), public expenditure and financial accountability (PEFA) country reports (see ● **Technical Note 11** for details on PEFA), and other analytical reports.

- Other sources: Check the websites of international donors and non-governmental organizations active in the country in question, websites of the OECD, UNICEF and UNDP, particularly the annual Human Development Report.

- External publications, especially academic research and evaluation studies: Type in JOLIS, scroll down, and choose EconLit under "Popular Resources," then search by topic, author, or title. This source of data varies in its quality. Agencies such as the World Bank and academic journals have standards and processes, such as peer review requirements, that at least create a floor on quality. However, small donor groups, such as non-governmental organizations, may lack such processes. Studies conducted by groups such as these can vary widely in quality, depending on the individual doing the study. The only way to judge data from these studies is to read the original studies.

● Technical Note 6: New data collection

Strongly consider collecting your own data when the topic is important and the data required to assess it are unavailable or unusable.

- When new data have to be collected, design decisions by the PER team will define its quality. For example, if sampling is required, the team's choice of its sampling frame and sampling criteria for selecting the units to be surveyed will determine if the results can be properly generalized to the universe.

- When new data collection is essential, the team should, as needed, renegotiate the Bank's budget for the expenditure review to cover the costs of new data collection or seek substantial trust funding to cover its costs.

- If time and budget do not permit new data collection, consider assembling a panel of experts or a focus group to give you a sense of the shape and magnitude of the issue. Methods certainly exist for increasing the validity and reliability of qualitative data collected through expert panels or focus groups. However, the intent here is to determine whether the PER should recommend new data collection if future operations or analytic work must address the issue in question.

- If you can do nothing or little about important data gaps, describe them in the review and flag the need for future work. Finesse the data gaps as best you can.

⬭ Technical Note 7: Definitions and notes on indicators

Core Indicators	Definitions / Notes
Number of schools	• By level, location, type • "School" is a service point (or campus that is part of a larger educational institution) that provides instructional or education-related services to a group of pupils. A school may have a single administrative unit with several service points (or group of branch schools or satellite school or campuses). An administrative unit refers to any school, or group of schools, under a single director or a single administration. A service point refers to any location that provides a service for pupils or students, whether it is a single entity or part of a larger administrative unit **(UIS)**.
Number of students in school	• By level, gender, school location, school type • Total number of students in the theoretical age group for a given level of education who are enrolled in that level, expressed as a percentage of the total population in that age group **(UIS)**.
Number of students in tertiary education	• Number of students enrolled in college and university programs in a given academic year, per 100,000 inhabitants **(UIS)**.
Net enrollment rate	• By level; if net enrollment rate (NER) is not available, gross enrollment rate (GER) • Total number of students in the theoretical age group for a given level of education who are enrolled in that level, expressed as a percentage of the total population in that age group **(UIS)**.
Number of out-of-school children	• By level • Children in the official primary school age range who are not enrolled in either primary or secondary schools **(UIS)**.

Core Indicators	Definitions / Notes
Dropout rate by grade	• Proportion of pupils from a cohort enrolled in a given grade at a given school year who are no longer enrolled in the following school year **(UIS)** (except for those graduating).
Repetition rate by grade	• Number of repeaters in a given grade in a given school year, expressed as a percentage of enrollment in that grade the previous school year **(UIS)**. • Administrative data usually calculate the number of dropouts as those individuals who neither transition to the next grade nor are repeaters. But the literature shows that repetition is systematically underestimated, producing overestimates of dropout rates. Significant internal or external migration also poses measurement problems. Students who move are counted as dropouts from their school of origin, but this does not mean that they do not re-enroll in a school at their new destination.
Additional Indicators:	
Private educational institutions	• Private educational institutions that are controlled and managed by a non-governmental organization (e.g., a church, a trade union, a business enterprise, or a foreign or international agency), or its governing board consists mostly of members who have not been selected by a public agency **(UIS)**.
Net intake rate to Grade 1 of primary education	• New entrants to Grade 1 of primary education who are of the official primary school entrance age, expressed as a percentage of the population of the same age **(UIS)**.
New entrants	• Students who, during the course of the reference school or academic year, enter a program at a given level of education for the first time, irrespective of whether the students enter the program at the beginning or at an advanced stage of the program **(UIS)**.

Note: The UIS Glossary includes terms related to education, science, technology and innovation, culture, and communication and information, and can be found at http://uis.unesco.org/glossary.

⬤ Technical Note 8: Definition of source of funds

Sources of funds include public, private, and international sources (UIS). *Private entities* include households, firms and business enterprises, and nonprofit organizations (including religious organizations) which, although their principal activity is non-educational, might finance activities in the domain of education **(UIS).**

A useful source for the relative proportions of public and private expenditure on educational institutions by level of education is **OECD,** ***Education at a Glance*** **(2016)**, Table B3.1a.

⬤ Technical Note 9: School fees and other informal payments

The burden on households as a result of fee payments can be significant. For instance, the demand response in countries that have abolished fees at the primary level (e.g., Malawi, Tanzania, Kenya, Uganda, and Cameroon) is strong evidence that tuition fees curtail demand. As Kattan and Burnett (2004) point out, in addition to tuition fees, households frequently face a wide range of user fees for publicly provided primary education, including textbook fees, compulsory uniforms, parent-teacher association (PTA) dues, and various special fees, such as exam fees and community contributions to district education boards. In many countries, private tutoring adds to the household costs of primary education. Typically, the poorer the family, the greater the burden of education spending. In Thailand, for instance, poor households spend 47 percent of their consumption on education, while the average for all households is 16 percent.

The World Bank conducted surveys on user fees in 2001 and 2005, with a focus on fees in primary education.[29] The 2005 survey included questions about lower secondary education, as well as primary education fees. For the primary school level, the Bank collected data for 79 countries in 2001 and 93 countries in 2005 (out of a total of 144 World Bank client countries). In 2005, it collected data at the lower secondary level for 76 countries.

The 2005 survey results showed that user fees were common at the primary level. Of the 93 countries surveyed, only 16 countries had no fees. Five countries had all five types of fees (tuition, textbook, uniforms, financial contributions, and other school-based activity fees): the Dominican Republic, Haiti, Honduras, Indonesia, and Vietnam. In 59 countries, or 62 percent of those surveyed, national policy did not address the elimination of fees. More fees were collected at the lower secondary level (94 percent of surveyed countries) than at the primary level (81 percent of countries). In addition, fee levels were generally significantly higher in lower secondary than at the primary level. Of the 76 countries for which responses were received regarding secondary school fees, 94 percent reported that at least one type of fee was collected. Most countries generally had several types of fees; just 10 countries required only PTA or community contributions. Fifty-one countries had more than one type of fee in lower secondary education, and seven countries had all five types of fees for lower secondary education: Bangladesh, Bolivia, Honduras, Indonesia, Lesotho, Mozambique, and Uganda (Kattan 2006).

Informal payments in education are charges for education services or supplies that are meant to be provided for free or are paid "under the table" directly to public officials or teachers to obtain specific favors. These are generally measured as the fraction of survey respondents reporting that they made payments to a public education entity for education services intended to be free of charge. Household surveys and perception surveys of citizens and public officials are the most common sources of information. More detailed surveys may also include data on the average value of payments made, the recipients of the payments, and the specific services for which the payments were made. Types of informal payments include, but are not restricted to, payments for admission, advancement, preferential access to resources, and specific grades. Data on informal payments in education are increasingly being collected, but household surveys vary in whether, and how well, they measure informal payments (Lewis and Pettersson 2009).

● Technical Note 10: Calculating the share of a nation's resources going to education

Three options are gross domestic product (GDP), gross national product (GNP), and gross national income (GNI). They differ, sometimes noticeably, depending on the country's economic arrangements. All three measures reflect the national output and income of an economy. The main differences are that gross national product takes into account net income receipts from abroad (gross domestic product + net property income from abroad). In other words, GNP measures the value of all goods and services produced by nationals whether in the country or not. Net income from abroad includes dividends, interest, and profit. Gross national income is based on a principle similar to gross national product; the World Bank defines GNI as "the sum of value added by all resident producers plus any product taxes (minus subsidies) not included in the valuation of output, plus net receipts of primary income (compensation of employees and property income) from abroad" (see http://data.worldbank.org/indicator/NY.GNP.ATLS.CD). The World Bank now uses GNI to classify economies into income groupings.

Gross national income is possibly a better metric for the overall economic condition of countries whose economies include substantial foreign investments. However, major comparative databases for education use gross domestic product in their financial measures, such as unit costs. These include OECD's *Education at a Glance* and UNESCO's Institute of Statistics. Although gross national income might be more accurate for certain types of countries (e.g., China), losing comparability to data in the major education databases is of real concern.

⬤ Technical Note 11: Public expenditure and financial accountability (PEFA) country reports

PEFA is a methodology for assessing public financial management performance. It identifies 94 characteristics (dimensions) across 31 key components of public financial management (indicators) in seven broad areas of activity (pillars). The program provides a framework for assessing and reporting on the strengths and weaknesses of public financial management (PFM) using quantitative indicators to measure performance. The purpose of a good PFM system is to ensure that the policies of governments are implemented as intended and that they achieve their objectives. An open and orderly public expenditure and financial accountability system is one of the enabling elements needed for desirable fiscal and budgetary outcomes. Public expenditure and financial accountability country reports provide a snapshot of a country's performance in this area at specific points in time using a methodology that can be replicated in successive assessments, giving a summary of changes over time.

⬤ Technical Note 12: Public Expenditure Tracking Surveys (PETS), Quantitative Service Delivery Surveys (QSDS), and Service Delivery Indicators (SDI)

Good public expenditure management requires attention to the level of aggregate spending, allocation of public funds, and actual service delivery. The Bank's public expenditure reviews focus on the first two issues, but the third tends to receive less attention primarily because of a lack of relevant data. Public spending data, irrespective of category, tends to be a poor proxy for actual service delivery. Lack of information on actual delivery also creates an identification problem when the efficacy of public capital or services needs to be evaluated. The case where public capital or services actually created by public funds are highly productive, but the supply system is not, cannot be distinguished from the case where the supply system is effective, but the goods and services being produced yield few benefits.

PETS, QSDS, and SDI are designed to provide the missing information from different tiers of government and frontline service facilities, using the sample survey approach. The former collect data at each tier of government to create a picture of how funds and other resources are flowing and where they may be leaking.[30] The latter collect a wide variety of information from schools and other sources to answer a range of questions about service delivery.

Methodology

As their names imply, both of these tools rely primarily on surveys and require the same technical expertise as that required by any properly conducted survey. This includes skills in constructing sampling; designing and pretesting survey instruments; training and monitoring the performance of data collectors; establishing efficient routines for cleaning the data; and analyzing the data. The QSDS, especially, also uses public accounts sample data, preferably panel data, on government spending and information on outputs of service providers at ministerial, regional, local, and service-provider levels.

Public Expenditure Tracking Survey

A Public Expenditure Tracking Survey is useful when a resource has to travel from one source to the beneficiary. An example is the money that a secondary student earns after school to help pay his school fees, although even here parents can divert the money to buy goods and services for the household, or even to gamble or drink. Even when the source and beneficiary are close to the same, as when PTAs raise funds for particular uses by their schools, the money can be diverted through corruption or used for unintended purposes. As the chain between the initial source and the ultimate beneficiary lengthens, the chances that the resource will fail to reach the beneficiaries increase. For example, the chain from the procurement of textbooks by the central level to students in schools can be long, with substantial loss through poor storage, lack of distribution from subnational storehouses and school storerooms, or diversion for sale on the private market.[31]

The first Uganda education Public Expenditure Tracking Survey developed the use of surveys to track resource flows (Reinikka and Svensson 2004). The survey collected data from central ministries, local governments (districts), and schools. It tracked the delivery of capitation grants to cover schools' non-wage expenditures. Using panel data from a unique survey of primary schools, the study assessed the extent to which the grant actually reached the intended end-user (schools). The survey data revealed that during 1991–95, the schools, on average, received only 13 percent of the grants. Most schools received nothing. The bulk of the school grants were captured by local officials. The data also showed considerable variation in grants received across schools, suggesting that some schools used their bargaining power to secure greater shares of funding, rather than being passive recipients of flows from the government. Specifically, schools in better-off communities managed to claim a higher share of their entitlements. As a result, actual education spending, in contrast to budget allocations, proved regressive.

The Public Expenditure Tracking Survey for Peru's "glass of milk," or *Vaso de Leche*, program presents an excellent example of how the flow of complex resources can be traced through multiple levels (World Bank 2002). This program distributed to low-income families milk in any form, milk substitutes, or other foods such as soybean, oatmeal, quinoa, and kiwicha. Its main goal was to improve the nutritional level of infants, small children (school age or younger), and pregnant or breastfeeding mothers, and to improve the quality of life of the poorest segments of the population.

The project measured leakages through surveys at each level in the transfer process from the central authority down to the household. Specifically, it traced the flow and leakage of central funds from the top of the chain to the last link at the bottom, by using survey data at the level of the municipality, at the level of the local milk-distribution committees, and, finally, at the level of the beneficiary household. The methodology is very complex, not only because it involved multilevel comparisons, but because the input itself was transformed from cash to commodities as the funds moved from the top to the bottom, and as "the commodity" itself actually became commodities, since the program was not limited to milk or milk products alone. The product was then transformed at the household level, as the food products were mixed with other foods before being served. Yet, despite this complexity, the survey was able to determine the relative magnitude of leakages at each level.

The tracking survey found that targeted beneficiaries received, on average, the equivalent of 29 cents of each dollar initially transferred by the Central Government. This does not mean that 71 cents from each dollar were fully lost in corruption costs. Rather, the diverted resources leaked away through a combination of factors: off-budget administrative costs; expenditure on non-eligible products; in-kind deliveries to non-beneficiaries; fees for overpriced items; and, last but not least, sheer corruption.

Surprisingly, the leakages were much higher at the bottom levels (the *Vaso de Leche* committees and households) than at the top (central government and municipalities). The findings turn on its head the conventional belief that every local body is necessarily more accountable than the national and public authorities. In addition, the Peru case highlights the importance of good program design and of transparent and accountable local organizations.

The relationship between the direct beneficiaries and the local *Vaso de Leche* Committees[32] has two important features. First, final beneficiaries had limited information about decisions made by the committees, the amount of resources to which households were entitled, and effective ways to secure the resources. Second, the committees operated without transparency or accountability to either the beneficiaries or the upper echelons of government. In fact, the committees so dominated the running of the program at the local level that they could divert resources from their original purpose, without being held accountable or sanctioned for doing so, since neither the higher authorities nor the intended beneficiaries knew about it. The committees then distributed the resources at their own discretion and sometimes ended up diluting, even unwittingly, the program's expected effects. These findings highlight the design flaws of the program. The local committees were not accountable to the beneficiaries, and they were frequently dominated by rent-seeking "representatives" of the program beneficiaries.

Upon reaching the households, the resources sometimes underwent additional dilution. On average, target beneficiaries only received 41 percent of the ration that arrived at the household (not taking into account all of the losses associated with earlier leakages). This dilution effect was possible because, in most cases, the beneficiaries did not receive their rations directly from the committee; rather, the children received the rations through their mothers (or, in some cases, their fathers), who picked up the total rations allocated to the household. Consistent with evidence from studies of other nutritional assistance programs worldwide, the official distribution criteria are very difficult, if not impossible, to enforce. In most cases, it is impossible to exclude non-targeted members of the household from utilizing the resources. Furthermore, in about 60 percent of the committees visited, the products were distributed in unprepared forms. These unprepared products are frequently mixed into dishes that feed the whole family.

Quantitative Service Delivery Surveys

A Quantitative Service Delivery Survey examines the efficiency of public spending and incentives, and various dimensions of service delivery in provider organizations, especially at the level of the service facility. It measures the resources delivered, such as the actual hours of instruction per day that teachers provide, the student-textbook ratio at the classroom level, the receipt of fiscal transfers from national and subnational levels of government, the size and use of the school's own revenues, and so forth. It also quantifies the factors affecting the quality of service, such as incentives, accountability mechanisms, and the relationship between agents and principals. Typically, the facility or frontline service provider is the main unit of analysis, much in the same way that the firm is the unit of observation in enterprise surveys and the household in household surveys. In each case, the surveyor collects quantitative data both through interviews and directly from the service provider's records. Facility data can be "triangulated" by also surveying local governments, umbrella non-governmental organizations, and private provider associations. The compilation of facility-level quantitative data typically requires much more effort than, say, a perception survey of service users, which makes this type of survey more costly and time-consuming to implement than its qualitative alternatives.

The Zambia Public Expenditure Tracking Survey and Quantitative Service Delivery Survey illustrates the types of data (Table TN2) and the range of survey modules (Table TN3) used to produce a Quantitative Service Delivery Survey.

Table TN2. Data Source

Data	Description
PETS-QSDS 2014	See sub-section PETS-QSDS 2014
NAS 2014	National assessment of Grade 5 students and teachers
LCMS 2010 and 2015, and ZDHS 2013-14	GER, NER, and out-of-school children
ESB 2013	Enrollment and school numbers, repetition and dropout rates, teacher statistics
Yellow and Bluebooks	Government financial statement C and budget
Interviews and Meetings	GoZ officials and CPs

Source: World Bank 2015, table 2.1, p.16.
Note: PETS = Public Expenditure Tracking Survey; QSDS = Quantitative Service Delivery Survey; NAS = National Assessment Survey; LCMS = Living Conditions Measurement Survey; ZDHS = Zambia Demographics and Health Survey; GER = gross enrollment rate; NER = net enrollment rate; ESB = Education Statistical Bulletin; GOZ = Government of Zambia ; CPs = Cooperating Partners.

Table TN3: Survey modules, contents, and respondents

Data	Primary Respondent/Source	Description
Teacher List	Supervisor based on registry (teacher register)	Listing of all teachers (for grades 2, 5, 7, 9 and 11) and their information.
Student and Teacher Selection Module	Supervisor	A list sample students and teachers, and mapping of students and teachers
Teacher Attendance I (First Visit)	Head teacher based on registry (attendance book)	Basic teacher information and teacher attendance for all teachers listed
General School, Part A	Head teacher based on registry (student and teacher registers and attendance books)	General school information, location, facilities, enrollment, and repetition
General School, Part B	Head teacher/financial administrator based on registry (accounting books)	School financing, fund flow, expenditure, and decision-making
Head Teacher, Part A	Head teacher	Head teacher information
Head Teacher, Part B	Head teacher	Head teacher personality and motivation
Teacher, Part A	Sample teacher (up to three teachers)	Detailed teacher information and characteristics
Teacher, Part B	Sample teacher (up to three teachers)	Teacher personality and motivation
Student, Part A	Sample students (up to 20 students)	Detailed student information and characteristics for selected students
Student, Part B	Sample students (up to 20 students)	Student personality and motivation

Data	Primary Respondent/Source	Description
Household	Parents of sample students	Household demographics, education, and economics status
Classroom Observation	Observer	Observation of classroom of Grade 5 sample teachers
Teacher Attendance II (Second Visit)	Observer	Second unannounced school visit to check attendance of 10 random, sample teacher
PEO	Supervisor	PEO office information and PETS
DEBS	Supervisor	DEBS office information and PETS
Grade 9 Student Assessment	Sample students selected for interview module 7	Grade 9 student assessment
Grade 9 Teacher Assessment	Sample teachers selected for interview module 6	Grade 9 teacher assessment

Source: World Bank 2015, table 2.2, p.16.
Note: DEBS = District Education Board Secretaries; PEO= Provincial Education Office.

Another good example of a Public Expenditure Tracking Survey and Quantitative Service Delivery Survey is **Philippines: Assessing Basic Education Service Delivery in the Philippines: Public Education Expenditure Tracking and Quantitative Service Delivery Study.**

Service Delivery Indicators (SDI)

These data are used to assess the quality and performance of education (and health) services over time. Decision makers can use these data to track progress, and citizens can use them to hold governments accountable for public spending. The indicators are broken down into three categories: (i) provider competence and knowledge; (ii) proxies for effort; and (iii) availability of key infrastructure and inputs. The indicators are quantitative and ordinal in nature (to allow cross-country and country specific comparisons).[33]

⬤ Technical Note 13: Definitions and notes on monetary-input indicators

Core Indicators	Definitions / Notes
Public expenditure on education	**OECD, _Education at a Glance_ (2016)**, Table B4.1 **Public expenditure on education** covers direct public expenditure on educational institutions, as well as public support to households (e.g., scholarships and loans to students for tuition fees and student living costs) and to other private entities for education (e.g., subsidies to companies or labor organizations that operate apprenticeship programs). It includes expenditure by all public entities, including ministries other than ministries of education; local and regional governments; and other public agencies (OECD 2016, 228–9)
Public expenditure on education as a percentage of total public expenditure and as a percentage of GDP, by level of education	**UIS (EdStats)** **OECD, _Education at a Glance_ (2016)**, Table B4.2 As defined above, "public expenditure on education" includes public subsidies to households for living costs, which are not spent in educational institutions. Therefore, the figures presented here exceed those on public spending on education institutions found in Table B2.3 below (OECD 2016, 231)
Government expenditure per student (i) as a percentage of per capita GDP; (ii) in U.S. dollars; and (iii) in local currency, by level of education	(i) Average total general government expenditure (current, capital, and transfers) per student in the given level of education, expressed as a percentage of per capita GDP (UIS) http://data.worldbank.org/indicator/SE.XPD.PRIM.PC.ZS (primary); http://data.worldbank.org/indicator/SE.XPD.SECO.PC.ZS?end=2011&start=2011&view=chart (secondary); http://data.worldbank.org/indicator/SE.XPD.TERT.PC.ZS?end=2011&start=2011&view=chart (tertiary) (ii) Average total general government expenditure (current, capital, and transfers) per student in the given level of education, expressed in nominal U.S. dollars at market exchange rates **(UIS)**. Wils (2015) and UNESCO (2015d) project per student spending by country (iii) Average total general government expenditure (current, capital, and transfers) per student in the given level of education, expressed in local currency (UIS)

(Table continued on next page)

Core Indicators	Definitions / Notes
Expenditure on educational institutions as a percentage of GDP, by source of funding (public and private), and by level of education	UIS (EdStats) OECD, *Education at a Glance* (2016), Table B2.3.
Annual expenditure per student by educational institutions for all services, by level of education	OECD, *Education at a Glance* (2016), Table B1.1. In equivalent U.S. dollars, converted using purchasing power parity (PPP) for GDP, by level of education, based on full-time equivalents Note that this OECD indicator includes private spending on tuition fees that occur at educational institutions. In reality, it might be difficult to include private spending at educational institutions when calculating per student spending Per student spending can be broken down by subnational unit if the budget data and education statistics are available at subnational level. If school-level budget data and education statistics are available, and schools' locations (typically, urban or rural) can be identified, per student spending by geographical locations can be computed. If schools may be categorized by language of instruction, or religion, breakdown by those categories can be done
Annual expenditure per student by educational institutions for all services, relative to per capita GDP, by level of education	OECD, *Education at a Glance* (2016), Table B1.4. In percentage of per capita GDP
Relative expenditure per student (unit cost) by level of education	Per student spending can be expressed relatively between levels of education. The expenditure for primary is treated as the "base case". The expenditure for each other level/type of education is expressed as a percent of the base case. E.g., primary 1.0; secondary 1.2 (20 percent higher than primary); tertiary 1.5 (50 percent higher than primary). This indicator can show the relative cost of different levels of education easily
Public expenditure on education by economic classification	OECD, *Education at a Glance* (2016), Table B6.1. Share of current and capital expenditure by education level Table B6.2. Share of current expenditure by resource category (compensation of teachers, compensation of other staff, and other current expenditure)

Core Indicators	Definitions / Notes
	Capital expenditure: expenditure for education goods or assets that yield benefits for a period of more than one year. It includes expenditure for construction, renovation and major repairs of buildings, and the purchase of heavy equipment or vehicles. It represents the value of assets acquired or created–i.e., the amount of capital formation–during the year in which the expenditure occurs **(UIS)**.
	Current expenditure: expenditure for educational goods and services consumed within the current year and which would have to be renewed if needed in the following year **(UIS)**.
	Ideally, salary data should include all "staff compensation" as defined below: expenditure on teaching staff and non-teaching staff salaries; contributions by employers or public authorities for staff retirement and pension programs, and social insurance; and other allowances and benefits **(UIS)**.
	Current expenditure other than for staff compensation: expenditure on school books and teaching materials, ancillary services, and administration and other activities **(UIS)**.
	Teachers or teaching staff: persons employed full-time or part-time in an official capacity to guide and direct the learning experience of pupils and students, irrespective of their qualifications or the delivery mechanism (i.e., face-to-face or distance learning). This definition excludes educational personnel who have no active teaching duties (e.g., headmasters, headmistresses, or principals who do not teach), or who work occasionally or in a voluntary capacity in educational institutions **(UIS)**.
	Non-teaching staff: persons employed by educational institutions who have no instructional responsibilities. Although the definition can vary from one country to another, non-teaching staff generally include head teachers, principals and other administrators of schools, supervisors, counselors, school psychologists, school health personnel, librarians or educational-media specialists, curriculum developers, inspectors, education administrators at the local, regional, and national level, clerical personnel, building operations and maintenance staff, security personnel, transportation workers, and catering staff **(UIS)**.

Core Indicators	Definitions / Notes
Salary cost of teachers per student by level of education	OECD, *Education at a Glance* (2016), Table B7.1. Teachers' compensation usually consists of the largest part of education spending, and thus, spending per student. The salary cost of teachers per student is a function of (i) the instruction time of students, (ii) the teaching time of teachers, (iii) teachers' salaries, and (iv) the number of teachers needed to teach students, which depends on estimated class size (OECD 2015). Differences among countries in these four factors may explain, to a large extent, differences in spending per student. Conversely, a similar level of spending per student may be associated with different combinations of these factors. In other words, governments may be able to improve efficiency by changing combinations of these factors. For a detailed definition of this indicator, see "Box B7.1. Relationship between salary cost of teachers per student and instruction time of students, teaching time of teachers, teachers' salaries and class size" (OECD 2016, 264).
Teacher salary relative to public sector wages, per capita GDP, and those with similar qualifications	OECD, *Education at a Glance* (2016), Table B7.2. This indicator helps judge the adequacy of teacher salary level relative to the country's economic capacity and context. Data from a labor force or household survey can be used to compare wages among public servants and between similarly qualified individuals in the private and public sectors. It is also important to understand how teacher salaries are set and paid. Teachers' salary cost per student as a percentage of per capita GDP, by level of education.
Teachers' statutory salaries, based on typical qualifications, at different points in teachers' careers	OECD, *Education at a Glance* (2016), Table D3.1. Annual teachers' salaries, in equivalent U.S. dollars, converted using PPPs for private consumption. Teachers' salaries are expressed as statutory salaries, which are scheduled salaries according to official pay scales. The salaries reported are defined as gross salaries (total sum of money that is paid by the employer for the labor supplied) minus the employers' contribution to social security and pension (according to existing salary scales) (OECD). Salaries at starting; after 10 years of experience; after 15 years of experience; at top of scale, by level of education.

Core Indicators	Definitions / Notes
Teachers' actual salaries relative to wages of tertiary-educated workers	OECD, *Education at a Glance* (2016), Table D3.2a. Ratio of salary, using annual average salaries (including bonuses and allowances) of teachers in public institutions relative to the wages of workers with similar educational attainment (weighted average,) and relative to the wages of full-time, full-year workers with tertiary education.
Comparison of teachers' statutory salaries, based on typical qualifications	OECD, *Education at a Glance* (2016), Table D3.3a. Ratio of salaries at different points in teachers' careers, and salary per hour in U.S. dollars converted using PPPs for private consumption. Ratio of salary at top of scale to starting salary. Salary per hour of net contact (teaching) time after 15 years of experience (in U.S. dollars).

⬤ Technical Note 14: Calculating unit costs from aggregate and itemized spending

Mingat, Tan, and Sosale (2003) identify two basic ways to compute unit costs. Both should yield consistent results. In one approach, unit costs are calculated by dividing aggregate spending, such as that reported in budget documents, by the number of students. This is easy to implement, but the method can have problems. First, the aggregate data may be organized under rubrics that prevent clear-cut attribution of spending by level or type of education. For example, administrative expenditures may appear as one entry, with no distinction by level of education. A second problem is that the aggregate data may be organized according to sources of funds or to the structure of the government bureaucracy. As a result, expenditure for a given level of education may appear in several places in the budget, possibly without any detail regarding functional categories. For example, in some countries, the budget documents show spending supported by external donors separately, even though for analytical purposes, the expenditure may belong in the same category as the government's own spending. In addition, the data may not distinguish between capital investments and recurrent spending, making it difficult to compute meaningful indicators of costs.

Given the potential shortcomings and incompleteness of the foregoing approach, it is useful to check the estimates against those obtained through another approach, namely, by building up from the constituent parts of costs. In this approach, the cost components are identified, evaluated, and then aggregated to obtain the desired estimates. In primary education, for example, teachers and pedagogical materials are two of the main components of costs. Thus, the unit cost of these components is calculated separately and then added together to obtain an estimate of the overall unit cost of primary education. Furthermore, instead of dividing aggregate spending on each component by the number of students, other data can be used to make the estimates. For example, to obtain the unit cost of teacher inputs, we would use data on teacher salaries and pupil-teacher ratios. This approach yields more detailed analysis of education costs and provides a basis for simulating the cost implications of alternative choices in the delivery of education services.

⬤ Technical Note 15: Calculating unit costs when country's fiscal year and school year do not coincide

Although countries can differ in their definition of their fiscal year, it usually runs January 1 to December 31. The school year is almost always split across fiscal years. The unit cost can be calculated for a school year or for a fiscal year. However, the school year is usually the desired estimate.

Take this example: The fiscal year runs from January 1 to December 31. The school year is from September to June (where teachers are paid for 10 months), and September to August (where teachers are paid for 12 months). Assume that in Fiscal 2001, total expenditures in primary education are $100; in Fiscal 2002, $110. In School Year 2001/02, the total number of students enrolled in primary education is 15 students. Figure 1 shows how the school year splits across the fiscal years.

Figure TN1: Unit costs for one school year and two fiscal years

MONTH											
1	2	3	4	5	6	7	8	9	10	11	12
FY 2001 expenditures for primary education: US$100											
								School year 2001/02: primary			
FY 2002 expenditures for primary education: US$110											
Enrollment: 15 students											

The unit costs for School Year 2001/02 are:
- 0.4 of US$100 + 0.6 of US$110)/15 students = US$7.07/per capita (where teachers are paid for 10 months a year)
- 0.4 of US$100 + 0.8 of US$110)/15 students = US$8.53/per capita (where teachers are paid for 12 months a year)

⬤ Technical Note 16: Definitions and notes on non-monetary input indicators

Core Indicators	Definitions / Notes
Human resources inputs	
Pupil/student-teacher ratio (PTR or STR) by level, geographical location, and group of schools	Average number of pupils per teacher at a given level of education, based on headcounts of both pupils and teachers **(UIS)** Governments may have a policy defining a minimum or maximum student-teacher ratio. If this ratio continues declining, the government may need to require or incentivize subnational governments or schools to reduce the number of teachers to maintain the target size

Core Indicators	Definitions / Notes
Percentage of qualified teachers	A qualified teacher is one who has the minimum academic qualifications necessary to teach at a specific level of education in a given country. This is usually related to the subject(s) they teach **(UIS)**.
Ratio of teachers to non-teaching staff	Whereas PERs tend to focus on efficiency of distribution of teachers, that of non-teaching staff can be also important in countries where there is a generous supply of non-teaching staff.
Non-teaching staff per type of school	Some countries define norms for non-teaching staff per school size (number of students), school area, type of school, etc. Those norms may be very generous, indicating possible room for efficiency gains.
Organization of teachers' working time	**OECD, _Education at a Glance_ (2016)**, Table D4.1 The proportion of statutory working time spent teaching provides information on the amount of time available for non-teaching activities, such as lesson preparation, correction, in-service training, and staff meetings. A large proportion of statutory working time spent teaching may indicate that less time is devoted to tasks such as assessing students and preparing lessons. It also could indicate that teachers have to perform these tasks on their own time and, hence, to work more hours than required by statutory working time. Actual teaching time is the annual average number of hours that full-time teachers teach a group or class of students, including all extra hours, such as overtime. Statutory teaching time is defined as the scheduled number of 60-minute hours per year that a full-time teacher teaches a group or class of students, as set by policy, teachers' contracts of employment, or other official documents. Teaching time can be defined on a weekly or annual basis. Annual teaching time is normally calculated as the number of teaching days per year, multiplied by the number of hours a teacher teaches per day (excluding preparation time and periods of time formally allowed for breaks between lessons or groups of lessons). At the primary level, short breaks between lessons are included if the classroom teacher is responsible for the class during these breaks.

(Table continued on next page)

Core Indicators	Definitions / Notes
Classroom inputs	
Average class size	The average class size refers to the number of enrolled students divided by the number of classes for the whole country. To ensure comparability among countries, special-needs programs are excluded. Data include only regular programs at primary and lower secondary levels of education and exclude teaching in subgroups outside the regular classroom setting **(UIS)**.
	Governments may have a policy defining a minimum and maximum for average class size. If this ratio continues declining, the government may need to require or incentivize subnational governments or schools to consolidate schools and classes to maintain the target size.
Student-textbook ratio	This indicator may be important in countries where textbook supply is an issue.
Percentage of schools meeting minimum standards requirements for educational inputs	Minimum standards for educational inputs may include standards on prescribed textbooks, and access to computers for learning purposes.
Annual instructional time	This consists of the required number of hours of instruction per year. It is not the same as hours in school because those hours may include lunch and inter-class breaks. What is the required number of instructional hours per week for core subjects by grade? For vocational and educational training, what are theoretical and practical instruction hours?
Infrastructure inputs	
Average school size	This indicator may suggest a possible need to rationalize the school network in some parts of the country. It is often observed in countries where the school-age population is decreasing, or where rapid urbanization is taking place so that rural schools are losing students. Factors that influence a decision on whether to build a school include standards for maximum distance that primary- and secondary-level students should walk to school, and for minimum population in the catchment area required to establish a school.

(Table continued on next page)

Core Indicators	Definitions / Notes
Unit cost of building a classroom	The unit cost is primarily determined by construction materials, school design, and equipment. Vocational education and training programs require occupation-specific workshops and equipment.
Standards and schedule for infrastructure maintenance	It is essential that the education budget include facility maintenance and is fully disbursed for maintenance purposes.
Percentage of schools that run double shifts, triple shifts	Multiple-shift schools may be prevalent where there are not enough school buildings to offer single-shift schools. It is an efficient way of using existing infrastructure, but not ideal, particularly if a school runs more than two shifts.
Percentage of schools that use multi-grade classrooms	Multi-grade schools may be used to manage small student populations in rural areas. It is efficient to combine grades, but teacher training on multi-grade teaching is essential to provide good-quality teaching. Without proper training, such an approach may lead to poor-quality education and outcomes.
Percentage of schools meeting minimum standards requirements for learning conditions	Minimum standards for learning conditions may include standards on potable water, functional hygienic facilities, electricity, and libraries.

⬤ Technical Note 17: Definitions and notes on research indicators

Core Indicators	Definitions / Notes
Doctorate productivity	The number of doctorate degrees, relative to the number of full-time equivalent (FTE) academic staff.
Research publications (absolute numbers)	The number of research publications attributed to the department and that are indexed in the Web of Science Core Collection database, where at least one author is affiliated with the source university or higher-education institution.
Citation rate	The average number of times the department's research publications from the period 2010–13 are cited in other research (published in 2010–15), adjusted (normalized) at the global level for the field of science, and the year in which a publication appeared.

Core Indicators	Definitions / Notes
Top-cited papers	The proportion of the department's research publications that, compared to other publications in the same field and in the same year, belong to the top 10 percent of most frequently cited papers.
Interdisciplinary publications	Percentage of department's research publications that belong to the field's top 10 percent of publications with the highest interdisciplinary scores.
Research orientation of teaching	The degree to which research in the field informs the education offered by the institution (based on a survey of students in the program).
Postdoctoral positions	The number of postdoctoral positions relative to the number of academic staff who work full-time or equivalent.
External research income	Revenue for research that is not part of a core (or base) grant received from the government. Includes research grants from national and international funding agencies, research councils, research foundations, charities, and other nonprofit organizations. Measured in €1,000s, using Purchasing Power Parities (PPP). Expressed per full-time equivalent academic staff.
Research publications (size-normalized)	The number of research publications indexed in the Web of Science database, where at least one author is affiliated with the university, relative to the number of students.
Publication output	Number of all research publications included in the institution's publications databases, where at least one author is affiliated with the institution (per full-time equivalent academic staff)
Art-related output	The number of scholarly outputs in the creative and performing arts, relative to the full-time equivalent number of academic staff.
Citation rate	The average number of times the university's research publications are cited in other research (during 2011–14); adjusted (normalized) at the global level to take into account differences in publication years and to allow for differences in citation customs across academic fields.

Core Indicators	Definitions / Notes
Interdisciplinary publications	Extent to which reference lists of the university's publications reflect cited publications in journals from different scientific disciplines.
Research publications (absolute numbers)	The number of university research publications (indexed in the Web of Science Core Collections database), where at least one author is affiliated with the source university or higher-education institution.

⬤ Technical Note 18: Efficiency of the curriculum

Focused on a few, versus many, subjects. A curriculum fragmented across multiple subjects increases the number of different subject-matter specialists required. In this situation, teachers are less apt to be deployed efficiently, either because they are assigned classes out of their specialty (competence mismatches), or because specialty teachers teach fewer than the usual hours. A fragmented curriculum also increases the textbook varieties required, and disperses students' learning instead of focusing it on a few core subjects.

Focused on a limited, versus large, number of topics in each subject. A curriculum can cover a large number of topics in each subject, but inevitably, superficially. This approach usually necessitates revisiting the topic over several grades. Or a curriculum can address only a few topics per subject, but in depth, and then leave the topic. Studies show that the latter approach is much more efficient in terms of the use of instructional time and student's learning.

⬤ Technical Note 19: Demographic trends and enrollment projections

A country's demographic structure and trends significantly affect the sustainability of education spending. When examining the demographics data, it is important to understand what trends in the school-age population may imply about the inputs required now and in future. If the population is trending down, do trend data on the size of the teaching force and number of classrooms in use indicate that the government is downsizing inputs into the system—for example, reducing the number of teachers, or closing schools or classrooms?

Population data by single-year or five-year age groups—preferably for male, female, and total between 0 and 29 years of age, for the last five years and as projected for the next decade—will be useful. Population data is usually available in the government's population census statistics book (typically, General Statistics Office), or **UN World Population Prospects**. EdStats also has this kind of population data in the **Core Indicator Query**.

⬤ Technical Note 20: UNESCO's Education Policy and Strategy Simulation Model (EPSSim)

EPSSim is a sector-wide and goals-based generic model comprising the common features of all modern school systems, together with a set of optional components to be included or excluded as required to achieve a first approximation of a country's education system development. It is driven by demographic trends; enrollment targets are taken as a priori and the simulation calculates the corresponding financial-resource implications.

At the national level, EPSSim can accompany countries through all stages of the strategic planning and management cycle. The model was conceived with a view to providing technical and methodological support to national administrations and specialists in education ministries in their efforts to formulate credible education development plans and programs, including in the context of the Education for All (EFA) goals. The aim of the model is to provide a potentially self-contained package (including self-training features) that can be deployed by country planners without external support and can be adapted within a typical range of structural alternatives with minimal expertise. For instance, the model contains some built-in training modules which provide exercises on the key indicators used in the model and enable users to conduct a simplified simulation using hypothetical data.

EPSSim starts by computing the projected intake, enrollment, and flow rates on the basis of population data, enrollment status, and policy objectives. The number of enrollments by level and type of education, combined with the current and future modalities of resource utilization (teaching staff, equipment, infrastructure, etc.), enable the estimation of future requirements for teachers, non-teaching staff, instructional materials, educational facilities, and so forth. These projected requirements, together with cost-related data and hypotheses, provide information on financial requirements and the possible financing gaps associated with certain education policy goals.

The EPSSim software can be downloaded from **UNESCO's Inter-Agency Network on Education Simulation Models (INESM)** website.

For EPSSim file downloads, see: http://archive.is/U6qrO. For user guidance and more information on the model, see: http://unesdoc.unesco.org/images/0022/002201/220198E.pdf.

⬤ Technical Note 21: Simulating the economy-wide effects of alternative education scenarios

Appropriately designed Computable General Equilibrium (CGE) models may be the best tool for assessing the broad effects of alternative education scenarios. If such a model is used, it is essential that the Computable General Equilibrium analysis and the rest of the public expenditure review be closely integrated.

One such model is MAMS (Maquette for MDG Simulations), developed at the World Bank to assess strategies for achieving the 2015 Millennium Development Goals (MDG) and currently being broadened for the Sustainable Development Goals (SDGs).[34] In most applications, MAMS divides

education into three levels (primary, secondary, and tertiary). It considers the impact of private and government educational services on educational attainment and views financing of the government budget in the context of the projected growth in domestic tax revenues, foreign aid, and non-education demands on government resources (which sometimes may be reduced thanks to improved government efficiency). The level and distribution of labor market entrants across different educational levels influence production in different sectors, wages, trade, and gross domestic product. Such a detailed, economy-wide assessment of educational policies may have particularly high payoffs in low-income countries that are expected to see sharp increases in enrollment at different levels. In those countries, while government spending on education may increase to meet growing demand for teachers and other education workers, the actual supply of such workers may increase with a time lag, potentially resulting in supply-and-demand mismatches.

Depending on the country context and data availability, it may alternatively be better to use a more macro-oriented model that needs only data that are available for virtually any country. Such a model, labeled GEM-Education (the General Equilibrium Model for Education), is currently being piloted. The model splits the economy into two sectors (private and public). Then, it assesses the impact of alternative scenarios for enrollment and government-education services—which are translated into changes in government consumption and investment spending—on a set of key economic indicators. These include: household consumption and other final demands, gross domestic product, poverty, and the government budget. The channels through which different education scenarios impact the economy are: (i) labor productivity (mainly by influencing the educational composition of the labor force); and (ii) government spending, which requires adjustments in financing from some combination of domestic and foreign sources (taxes, foreign grants, and foreign and domestic borrowing) (World Bank 2013).

⬤ Technical Note 22: Definitions and notes on output and outcome indicators

Core Indicators	Definitions / Notes
Gross enrollment rate	Number of students enrolled in a given level of education, regardless of age, expressed as a percentage of the official school-age population corresponding to the same level of education. For the tertiary level, the population used is the five-year age group starting from the official secondary school graduation age **(UIS)**.
Net enrollment rate	Total number of students in the theoretical age group for a given level of education enrolled in that level, expressed as a percentage of the total population in that age group **(UIS)**.
Dropout rate by grade	Proportion of pupils from a cohort enrolled in a given grade at a given school year who are no longer enrolled in the following school year, except for those graduating **(UIS)**.
Repetition rate by grade	Number of repeaters in a given grade in a given school year, expressed as a percentage of enrollment in that grade the previous school year **(UIS)**.
Completion of an educational program	Participation in all components of an educational program (including final exams, if any), irrespective of the result of any potential assessment of achievement of learning objectives **(UIS)**.
Education attainment rate	The highest International Standard Classification of Education (ISCED) level of education an individual has successfully completed. This is usually measured with respect to the highest educational program successfully completed which is typically certified by a recognized qualification. Recognized intermediate qualifications are classified at a lower level than the program itself **(UIS)**.
Attendance rate	In contrast to the enrollment rate, this indicator sheds light on the frequency with which students attend school or education programs. Attendance-rate data are collected in household surveys such as Demographic and Health Surveys (DHS), Multiple Indicator Cluster Surveys (MICS), and Living Standards Measurement Study (LSMS).

(Table continued on next page)

Core Indicators	Definitions / Notes
Labor force participation **Employment and unemployment rates**	Employment and wage data for recent graduates are often used to shed light on this question. But be aware that these data reflect supply-and-demand interactions, not necessarily the adequacy of the skills developed by the educational system.
External research income	Research revenue that is not part of a core (or base) grant received from the government. It includes research grants from national and international funding agencies, research councils, research foundations, charities, and other nonprofit organizations. Measured in €1,000s using Purchasing Power Parities (PPP). Expressed per full-time equivalent academic staff.

⬤ Technical Note 23: Concepts of effectiveness and efficiency

Concept	Definition
Effectiveness	When something is deemed effective, it has met an intended, desired, or expected outcome. Unlike the concept of efficiency, effectiveness alone is determined without reference to costs. In popular discourse, effectiveness means "doing the right thing," and efficiency means "doing the thing right." When effectiveness is combined with cost, "cost-effectiveness" relates monetary inputs and non-monetary outputs and outcomes.
Technical and productive efficiency	Technical and productive efficiency are two closely related concepts that are often lumped together under the term technical efficiency. In both cases, we are looking for the best outcomes at least cost, a result that may be achieved in either of two ways: (i) by reducing the inputs used by a given intervention to the minimum required to achieve the outcome sought (technical efficiency), or (ii) by selecting a different intervention—i.e., one with a different combination of resources—that achieves at less cost the outcome sought as well as, or better than, the alternatives (productive efficiency). Technical efficiency refers to the physical relation between a set of resources (capital and labor) and an education outcome. A technically efficient position is achieved when the maximum possible improvement in the outcome is obtained from the resource inputs. An intervention is technically inefficient if the same (or greater) outcome could be produced with less of one type of input. For example, if research shows that a student-textbook ratio of 2/1 results in the same learning gains as a ratio of 1/1, the higher ratio is technically more efficient. Technical efficiency cannot directly compare alternative interventions. Productive efficiency, closely related to the concept of technical efficiency, directly compares alternative interventions. It asks about the cost benefit or cost-effectiveness ratios of resource combination A versus alternative resource combinations. For example, if the objective is to improve teachers' classroom

Concept	Definition
	performance, educators can try alternative training regimes. Teachers can attend a week of training at a teacher college. They can participate with their same-grade or same-subject colleagues in weekly, facilitated training sessions at their schools. They can take online courses at home beamed via the government television station. What does each option cost, and how well does it improve teachers' classroom performances? Since different combinations of inputs are being used, the choice between interventions is based on the relative costs of these different inputs relative to the same outcome (better teacher classroom performance). Productive efficiency enables assessment of the relative value for money of interventions with directly comparable outcomes. It cannot address the impact of reallocating resources at a broader level—for example, from teacher training to infrastructure—because the education outcomes are incommensurate.
Allocative efficiency	Allocative efficiency takes account of the productive efficiency with which education resources are used to produce education outcomes and how these outcomes are distributed among the community. Such a societal perspective is rooted in welfare economics. The World Bank defines the concept of allocative efficiency as the capacity of government to distribute resources on the basis of how well its public programs meet its strategic objectives (Schick 1998; Shand 2000). This includes the ability to shift resources from old priorities to new ones, and from less- to more-effective programs. Allocative efficiency thus requires that governments establish and prioritize objectives, and that they assess the actual or expected contribution of public expenditures to those objectives. Shand's (2000) summary of the basic principles of allocative efficiency states that expenditures should be affordable in the medium term and be based on government priorities and the effectiveness of public programs.
Internal efficiency	Internal efficiency measures the percentage of children who complete an educational cycle (e.g., primary education or lower secondary education) as a share of those who start the cycle or as a percentage of those who finish the cycle in the minimum number of years. The first definition allows the calculation of the dropout rate—i.e., the number of those who start, minus the number who ultimately complete as a share of those who start. The second definition measures the dropout rate plus the repetition rate. Dropping out imposes costs on individuals and countries in the form of unrealized human capital. Repetition imposes costs on the sector in the form of its having to pay double (or triple) the unit cost of a year of school per repeater.
External efficiency	External efficiency measures the returns to individuals, employers, and the country of public and private investments in education. It depends on a match between the type and quality of skills and knowledge that school leavers acquire in school relative to the skills and knowledge needed by the country and needed and paid for by employers. Does education improve the employability and wages of school leavers? Does public investment in education and training contribute to the country's growth and economic development? Measuring and linking employment and wage returns to education is particularly important for vocational education and training, and for tertiary education.

⬤ Technical Note 24: Cost-effectiveness analysis

Cost-effectiveness relates monetary inputs and non-monetary outputs and outcomes. An increasing number of impact evaluations of various interventions have assessed their cost-effectiveness relative to student learning and other outcomes. For instance, to provide comparable cost-effectiveness estimates across different policy options, the Abdul Latif Jameel Poverty Action Lab (J-PAL) has adopted a standard methodology for conducting cost-effectiveness analysis of randomized trials of 29 programs.[35] The trials found that the effectiveness and costs of numerous strategies to improve student learning vary considerably. Some programs achieve learning gains with much greater cost-effectiveness than others.

Be alert to the quality of cost-effectiveness analyses. The risks of correlations being interpreted as causal relationships rise substantially when the methodology of the study does not use a randomized controlled trial, a difference in differences (DD) regression design, a regression discontinuity design (RDD), or matching methods. For example, teachers with formal degrees may increase their students' learning more than teachers without such qualifications. However, teachers who obtain formal degrees may differ in important ways from those who do not, and these differences may account more for their students' learning gains than the teachers' formal degrees.

Most research studies in the development literature do not protect well against bias and cannot be properly used to draw causal inferences (X causes Y). At the same time, if these are the only studies available, flag the potential for bias, triangulate where possible, and be **very careful** to state conclusions in correlational, not causal, terms. For critical policy questions, suggest that a small, randomized trial be conducted to sort out correlation from causation.

Careful meta-analyses[36] of the effects of inputs on participation in school and learning find numerous instances where the "common wisdom" about the effects of inputs is either wrong or fails to take into account the conditions that have to be in place for those effects to occur. Take the example of textbooks. The 3ie study reported a relatively consistent pattern of textbooks having no effect on learning outcomes, as measured by math, language, and composite test scores (Snilstveit 2016). However, the study found that many of these programs experienced implementation challenges—e.g., the books did not reach the students because they were locked up for "safekeeping."

For their methodologically less-rigorous sample of 79 studies, Glewwe et al. (2011) found that most studies showed positive effects, and that most of these effects were statistically significant. This evidence strongly suggests that textbooks and similar materials (workbooks, exercise books) increased student learning.

However, when the analysis was restricted to the methodologically more-rigorous sample of 43 studies, the estimated effects of textbooks were far from unanimous. Slightly less than half of the estimates showed positive effects, and only three of these were significantly positive (and one was significantly negative). Thus, after dropping less-rigorous studies, the evidence that textbooks and similar materials (workbooks, exercise books) increased student learning was quite weak.

The one "gold standard" randomized, controlled trial in the Glewwe et al. (2011) sample found no impact of providing textbooks. However, the authors of that study conducted further analyses to determine why textbooks did not raise scores. The results of the study did not appear to be statistical artifacts. The treatment and comparison schools were similar in geographic location, enrollment, and pre-program test scores. Neither selection nor attrition bias appeared to drive the results. They found that the effectiveness of textbooks depended on prior conditions: textbooks improved the scores of students with higher pre-test scores. In other words, there was an interaction effect between pre-test scores and assignment to the textbook program that had a highly significant, positive correlation with post-test scores. Initially better students could benefit from the textbooks much more than initially weak students. The authors also found that the official Kenyan government textbooks were of limited use to many students. English is the medium of instruction in Kenyan schools, but it was the third language for many pupils, including those examined in this study. The study showed that many students could not read the textbooks.

⬤ Technical Note 25: Cost-benefit analysis

Cost-benefit analysis, or CBA, is used when both the costs and outcomes can be monetized.[37] Rate-of-return analysis is the type of cost-benefit analysis most frequently applied to education. Rates of return to investments in schooling have been estimated since the late 1950s. George Psacharopoulos's (1973) findings on the rates of return to education—that primary education ought to be the main focus of national school systems, since its rate of return was found to be the highest among all education levels—continues to play an important role in the formation of significant global educational policies. In the intervening 40-plus years, however, the economies of many developing countries have matured, changing the relative returns to different levels of education. More recent discussions of the rates of return include Psacharopoulos and Patrinos (2004) and Montenegro and Patrinos (2014).

⬤ Technical Note 26: Calculating the budget costs of one completer and of one uninterrupted completer

This is a hypothetical example, although it uses real data for dropout rates by primary grade and for average repetition rates for primary education. It shows how to calculate what it costs to get one completer, who may, or may not have repeated one or more grades, and what it costs to get one uninterrupted completer who repeats no grades. The example does not calculate the substantial social and individual costs of dropping out of school, although, by making certain assumptions, this could be done.

Table TN4: Progression through primary school of Cohort A that starts with 100 grade 1 entrants

Grade	1	2	3	4	5	6	7	8	#
Number of new entrants to grade	100	67	50	37	27	20	15	10	326
Percentage of cohort who drop out during year	21	12	11	14	11	11	20	14	
Number of students who drop out during year	21	8	6	5	3	2	3	3	51
Total in class at end of year	79	59	44	32	24	18	12	7	
Using 15% repetition rate, number that do not move to next grade	12	9	7	5	4	3	2	1	43
Total who progress to next grade	67	50	37	27	20	15	10	6	232

Assumptions

(i) The per capita cost of a year of primary school in constant dollars is $50.

(ii) The per capita cost, in constant dollars, is the same across grade and across time.

(iii) The percentage of students who drop out by grade is taken from real data for a real country.

(iv) The average percentage of students who repeat a grade are taken from real data for the same country.

(v) A student who repeats a grade repeats that grade only once, although he or she may repeat one or more subsequent grades once.

(vi) All repeaters ultimately complete lower primary.

(vii) A student who drops out in a year costs $50, regardless of when he or she drops out in the year, because recurrent costs (e.g., number of teachers) are sunk costs by the time the student drops out.

(viii) Once a student drops out, the costs of all post-dropout years for that student are as budget savings to the system.

Table TN5: Costs of one completer and one uninterrupted completer

Cost and Savings	U.S. Dollars
If no students drop out or repeat and unit costs are $50 per capita in constant dollars, then the cost of a primary education (grades 1–8) for Cohort A is 100 × 8 × 50	**$40,000**
Per capita cost of 8 years of education (8 × 50)	**$400**
Total costs of those who start each of the eight grades, whether or not they subsequently repeat or drop out (326 students) + repeaters (43). The figure for repeaters includes the additional cost of the repeated year + all remaining years of primary education until completion.	**$29,100**
Costs of repetition alone (43 years repeated × $50 ÷ year)	**$2,150**
Savings from dropouts. Budgetary costs to a system with high dropout rates are lower than to a system with no dropout rates if we assume that when a student drops out, the system saves his or her full, $50÷year cost in each post-dropout grade. Social and individual and household costs, not computed here, are obviously substantial.	**$13,050**
Cost for one completer: 29,100 ÷ 49. Total completers = 49 (6 uninterrupted completers + 43 completers with one repeated grade). The cost is about 50% more than the cost without repetition, which is 8 × 50, or $400.	**$594**
Cost for one completer without interruption ($29,100 ÷ 6 completers who did not repeat any grade). The cost of one uninterrupted completion is about eight times the cost of a completion that includes repeaters.	**$4,850**

● Technical Note 27: Estimating private rates of return to education

The private rate of return compares the costs and benefits of schooling as incurred and realized by the individual student who undertakes the investment. The models and methods used to calculate private rates of return to education depend on the policy questions of interest and the quality of the available data. For example, allowing for heterogeneous returns to education across individuals with the same level of education--e.g., as a result of variations in cognitive achievements or regional variations in wage structures--is more data-intensive than assuming homogeneous returns.

In comparisons between countries of returns to education, Montenegro and Patrinos (2014) provide guidance for calculating private returns to education. Noting that the now-standard method for estimating private returns per year of schooling is the Mincerian earnings function method, they state that this means estimating log earnings equations of the form:

$$(1)\; Ln(w_i) = \alpha + \beta_1 S_i + \beta_2 X_i + \beta_3 X_i^2 + \mu_i$$

where $Ln(w_i)$ is the natural log (of hourly or annual, depending on data) earnings for the i_{th} individual; S_i is years of schooling (as a continuous variable); X_i is labor market potential experience (estimated as age$_i$ - S_i - 6); X_i^2 is potential experience-squared; and μ_i is a random disturbance term reflecting unobserved abilities. Therefore, β_1 can be viewed as the average rate of return to years of schooling to wage employment. The list of control variables is kept deliberately small to avoid overcorrecting for factors that are correlated with years of schooling. This is also known as the "Mincerian" method (Mincer 1974).

The earnings function method can be used to estimate returns at different schooling levels by converting the continuous years of schooling variable (S) into a series of dummy variables, say Dp, Ds and Dt (where p is primary schooling, s is secondary schooling and t is tertiary) to denote the fact that a person has achieved that level of schooling. The omitted level is people with no schooling and that dummy is not in the equation to avoid matrix singularity. The estimation equation in this case is of the form:

$$(2)\; Ln(w_i) = \alpha + \beta_p Dp_i + \beta_s Ds_i + \beta_t Dt_i + \beta_j X_i + \beta_j X_i^2 + \mu_i$$

After fitting this "extended earnings function" (using the above dummies instead of years of schooling in the earnings function), the private rate of return to different levels of schooling can be derived from the following formulas:

$$(3)\; r_p = (\beta_p)/(S_p)$$

$$(4)\; r_s = (\beta_s - \beta_p)/(S_s - S_p)$$

$$(5)\; r_t = (\beta_t - \beta_s)/(S_t - S_s)$$

where S_p, S_s and S_t stand for the total number of years of schooling for each successive level. Care has to be taken regarding the foregone earnings of primary school-aged children. In the empirical analysis that follows, we have assigned only three years of foregone earnings to this group, following tradition (Psacharopoulos 2004).

The costs incurred by the individual are his or her foregone earnings while studying, plus any tuition fees or incidental expenses incurred during schooling. Since schooling is mostly provided free by the state, at least at the basic education level, then in practice the only cost in a private rate of return calculation is the foregone earnings. The private benefits amount to what a more educated individual earns (after taxes), above a comparable group of individuals with less schooling. This more or less refers to adjacent levels of schooling; for example, tertiary versus secondary school graduates. Although convenient because it requires less data, this method is slightly inferior to the full discount method (Psacharopoulos 2004); in fact, it assumes flat age-earnings profiles for different levels of schooling (Psacharopoulos and Layard 1979).

From equation (1) the return to potential experience is given by:

$$(6)\; \beta_2 + 2\beta_3 X_i$$

which needs to be evaluated at a given value of X_i. For each sample we use the average years of potential experience as the evaluation point. It is important to stress that in the empirical part when we refer to potential experience we are referring to the estimates based on equation (1).

● Technical Note 28: Per capita financing

Per capita formula funding is widely used to help achieve both horizontal and vertical equity by adjusting a standard unit cost (horizontal equity) with coefficients to provide more funding for the disadvantaged (vertical equity). Whether per capita financing is in the form of a funding formula or other funding mechanism, it is important to examine how the unit cost is determined, what factors are taken into account to address vertical equity (e.g., special needs), and how funding is indeed implemented.[38]

● Technical Note 29: Targeting mechanisms, coverage, and depth of programs

Are there methods in place to identify the needs of disadvantaged students for education transfers or subsidies, such as scholarships and free textbooks? How are eligible students identified—e.g., projection from historical levels, geographic targeting, analysis of household survey data within the last five years, analysis of individual student data? Is there targeting to certain income, gender, or ethnic and religious groups? When educational merit is the basis, the subsidy or transfer will tend to favor wealthier families because of often observed learning gaps at lower levels of education by income quintile. Per student spending on targeted programs to provide various types of subsidies for disadvantaged students, such as schoolfee discounts or waivers, free lunch, or scholarships, can be separately computed. If education spending is allocated based on a formula, we need to assess whether the formula takes into account vertical equity by setting a higher unit cost (or coefficients) for special needs students, rural schools, and other types of disadvantages.

● Technical Note 30: Benefit incidence analysis

Benefit incidence analysis (BIA) is an analytical tool that helps examine whether the benefits of public expenditure are distributed across population groups by wealth or other socioeconomic or geographic characteristics. This type of analysis can be used to (Narayan 2014):

(i)   inform policymakers about the current incidence of social spending, i.e., the extent to which different segments of population (e.g., the poor or the rich) are benefiting from the current allocation of social spending, and changes in the incidence of spending over time;

(ii) establish a benchmark for cross-country comparison of distribution of public spending on social services;

(iii) analyze if specific policy reforms in the past may have accounted for the current observed incidence, or changes in the incidence of spending, over time; and

(iv) demonstrate whether a pro-poor benefit incidence is actually translated into better social outcomes for the poor).

Minimum practice—known as average (or simple) benefit incidence analysis—is to report average public education financing per child or per household by household consumption (e.g., quintile, decile), or by other socioeconomic or geographic characteristics (urban vs. rural, male vs. female, etc.). In this type of analysis, benefits are calculated, on average, on the basis of unit costs (aggregate expenditure divided by the number of beneficiaries), multiplied by the number of users of the service in a specific group (quintiles or deciles, etc.). In progressive or "pro-poor" public spending, poorer quintiles or deciles get a disproportionately higher share of the total benefit compared to their share in the national income distribution; for example, the bottom 40 percent receive more than 40 percent of the total funds. The choice of quintile definition (household versus population quintiles) may affect the analysis results due to variation in the numbers of individuals in each quintile. When quintiles are defined over the population, the population size of each quintile is defined to be equal. However, the population size of each household quintile varies, depending on the household-size characteristics of the quintile. Because poor households typically have a larger household size, when the household, rather than the population, is used for the analysis, the distribution of spending appears more progressive than it actually is (Demery 2000).

Government subsidies for services may vary significantly by region and across groups. Thus, aggregating unit subsidies may mask inequality. The best benefit incidence analysis practice involves more sophisticated analyses as opposed to the average benefit incidence analysis. These include analyses based on disaggregated unit subsidies (as opposed to average unit subsidies), where specific costs for specific interventions are accounted for separately. Demery (2000) gives examples of using disaggregated unit subsidies specified for different geographical areas and education levels.

Figure TN2: Concentration curve: government spending on education and various benchmarks
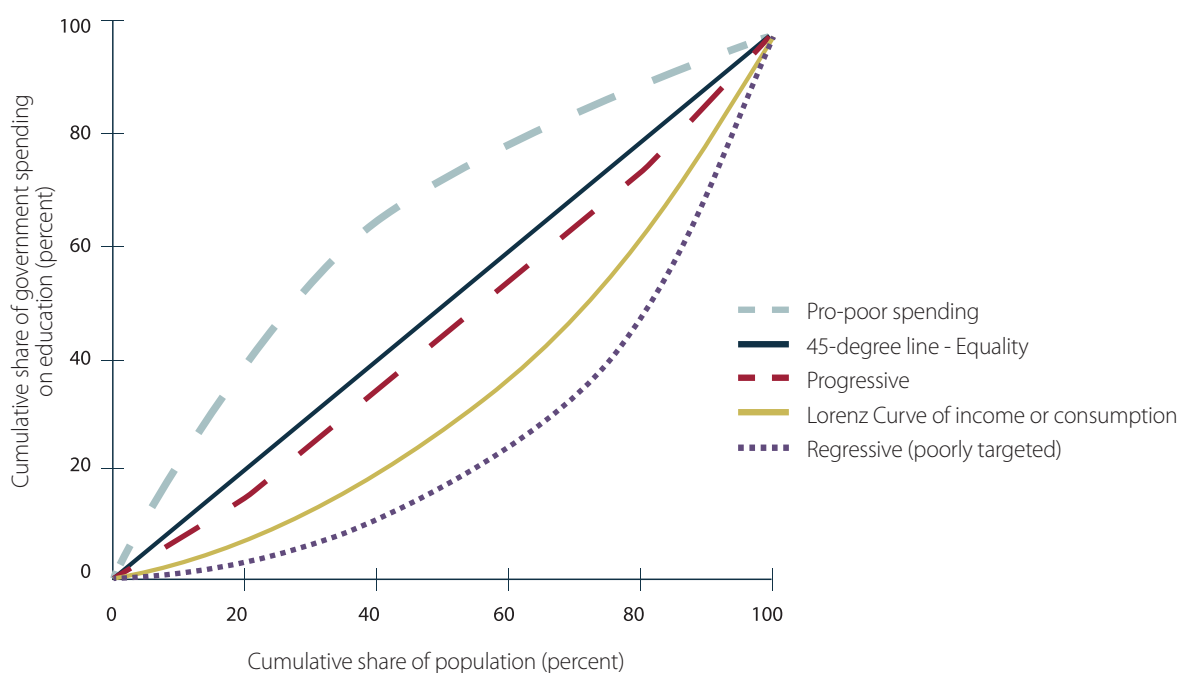
Source: Narayan (2014)

Concentration curve: A concentration curve shows the relationship between the cumulative share of government spending on education (y-axis) against the cumulative share of the population, ranked by consumption or income level from the poorest to the richest (x-axis).

Lorenz curve: A Lorenz curve shows the relationship between the cumulative distribution of total household expenditures against the cumulative population, ranked by consumption or income level.

Targeting: Public spending is pro-poor if the concentration curve for education benefits is above the 45-degree line; otherwise, pro-rich spending.

Progressivity: Public spending is progressive if the concentration curve for these benefits is above the Lorenz curve for income or consumption, but below the 45-degree line.

The results of a benefit incidence analysis can be presented in two ways: tabular or graphical (Lorenz or Benefit Concentration Curves). The expenditure *Lorenz curve* is derived from tracking the cumulative distribution of total household expenditures against the cumulative population, ranked by per capita expenditures. It provides a point of comparison against which to judge the distribution of education spending shown in the *concentration curves* (Demery 2000).

Public spending on education tends to be more pro-poor at lower education levels (e.g., primary), but becomes pro-rich for subsequent levels of education. Two main factors account for this phenomenon: (i) Poorer household quintiles tend to have more children than richer quintiles and may receive a disproportionately higher share of public education resources, at least at the primary level, and possibly at lower secondary level; and (ii) any poor children do not progress to secondary or higher levels of education, where per capita spending tends to be higher and where a disproportionately lower share of resources goes.

Other types of benefit incidence analysis include marginal benefit incidence analysis, which estimates the incidence of the last (or the next) unit of benefit, and behavioral benefit incidence analysis, which estimates behavioral responses to a policy change.

Narayan (2014) and Demery (2003) provide a good basic explanation of some of the issues and concepts in incidence analysis; Mingat, Tan, and Sosale (2003), in Chapter 7, provide a general discussion on calculating the distribution of public subsidies for education; van de Walle (2003) offers a more advanced treatment of some of the methodological approaches.

Other useful information on the topic, including manuals, guidelines and a STATA (data analysis and statistical software) program, which includes a module to perform benefit incidence analysis, can be found at the **Open Budgets Portal**.

⬤ Technical Note 31: Subsidies

Why do we care about subsidies for private schools? There is no obvious efficiency rationale for fully funding non-public schools unless they are shown to achieve better outcomes than public schools. Paying the full unit cost saves the state nothing, but partial subsidies can create incentives for private provision that save the state money because it does not have to pay the full cost of educating the child. Depending on how they are designed, public subsidies may implicitly subsidize the wealthy's preference for private education.

PART III: EXAMPLES

Process and criteria for selecting examples

The World Bank team examined about 80 education and cross-sectoral public expenditure review documents published between 2010 and 2016. A complete PER database, which also includes those published between 2002 and 2009, is available at **http://datatopics.worldbank.org/education/ wDataQuery/ByExpenditures.aspx.** The team adopted the following criteria to identify good examples of different topics of reviews:

- ▸ Analysis that is relevant, detailed, and comprehensive
- ▸ Analysis that provides a methodology
- ▸ Analysis that includes international and regional comparisons and benchmarks
- ▸ Analysis based on disaggregated data (if available), including subnational or school-level data, or data on specific student groups
- ▸ Analysis with clear and original presentation of results (graphs, tables, diagrams, etc.)
- ▸ Most recent analysis

For good examples of **policy recommendations**, the team selected reviews that provide clear, prioritized, specific, and implementable, and costed recommendations.

The team selected several country public expenditure review documents for more than one example because they show a relatively better treatment of a specific topic, compared to other country reviews. This section will be updated as more good examples become available.

Table of Contents
Examples

No.	Topic	Example	Page
1	**Policy recommendations**	Albania (2014); Ethiopia (2015)	88
2	**Data sources**	Myanmar (2015); Samoa PER Notes (2014)	96
3	**Analysis of sources of funds**	Nigeria (2015)	99
4	**Analysis of revenue sources**	Nigeria (2015)	100
5	**Analysis of decentralized financing**	Sudan (2014)	103
6	**Analysis of education financing by level of government and intergovernmental fiscal transfers**	Indonesia (2013)	104
7	**Analysis of school budget by financing source**	Philippines (2013)	108
8	**Analysis of household surveys on private spending**	Mali (2016)	112
9	**Analysis of donor funding**	Mali (2016)	115
10	**Analysis of total public education spending**	Albania (2014)	117
11	**Analysis of functional classification**	Honduras (2015); Kenya (2014)	118

(Table of Contents: Examples continued)

No.	Topic	Example	Page
12	**Analysis of education spending by economic classification**	Honduras (2015)	120
13	**Issues related to budget formation and execution**	Solomon Islands (2011)	121
14	**Analysis of per student spending**	Armenia (2011)	124
15	**Minimum norms and standards for resource allocation**	Belarus (2013);	126
16	**Analysis of cost of teachers**	Kosovo (2014); Jordan (2016)	130
17	**Analysis of teacher distribution**	Indonesia (2013)	140
18	**Cost projections**	Tajikistan (2013); Jordan (2016); Democratic Republic of Congo (2015)	144
19	**Fiscal sustainability analysis**	Albania Volume II (2014); Madagascar (2015)	149
20	**Demographic trends and enrollment projections**	Guinea (2015); Belarus (2013); Georgia (2015)	154
21	**Technical efficiency of inputs (efficiency indicators)**	Belarus (2013)	161
22	**Analysis of unit costs and outcomes**	Albania (2014); Belarus (2013); Indonesia (2013); Madagascar (2015)	163
23	**Cost-benefit analysis**	Ethiopia Policy Research Working Paper (2008)	173
24	**Data envelopment analysis**	Kenya (2013); Democratic Republic of Congo (2015)	176
25	**Internal efficiency indicators**	Bangladesh (2010)	182
26	**Rate of returns to education**	Sri Lanka (2011)	183
27	**Analysis of inequity**	Costa Rica (2015)	185
28	**Analysis of per capita financing**	Tajikistan (2013); Mauritania (2016)	188
29	**Analysis of cash transfer programs**	Costa Rica (2015); Indonesia (2012)	193
30	**Benefit incidence analysis**	Democratic Republic of Congo (2015)	197
31	**Analysis of private spending by income quintile**	Madagascar (2015)	199

⬤ Example 1: Policy Recommendations

Overall comment:

The **Albania** and **Ethiopia** public expenditure reviews meet most of the criteria for examples of good policy recommendations: clear, prioritized, specific, implementable, and ideally, costed.

In the Albania example, the recommendations are clear, specific, and prioritized (have a time frame for short- and medium-term policy recommendations), and at least part of these recommendations are costed. In the Ethiopia example, most recommendations are clear, quite specific, and somewhat implementable, but not prioritized, which is a drawback, given their number.

Democratic Republic of Congo PER (2015) also offers good policy recommendations, but it is not included in this section because of its length. It provides a separate table that lays out a proposed time frame and identifies the ministry (ies) within whose jurisdiction the policy recommendation falls.

Bad examples of policy recommendations include:

- Recommendations that are not prioritized or sequenced
- Vague imperatives that provide policymakers with little or no guidance about available options for fixing the problem
- Vague imperatives that fail to acknowledge the fiscal costs, technical complexity, political costs, or time frame required to try to fix the problem
- Policy implications or policy directions masquerading as policy recommendations

For example:

- "In a context of a rapid fall in learning outcomes, there is a need for additional public spending targeted directly at improving quality."
- "Improve the efficiency of public funding in the education sector."
- "Invest more in education, in line with other countries."
- "Increase the allocation of the public expenditures in Technical and vocational education and training (TEVET) as a share of total government education expenditure because the (private) rate of returns is high and the supply of the TEVET graduates is welcomed by the market but remains limited."

Albania PER (2014)

Expand Access to Pre-primary Education

One priority is the expansion of access to and quality of preprimary education; the cost can be offset by savings from declining student numbers in higher grades (short-term). By 2015, Albania's preprimary population is likely to stabilize at current levels but the numbers of students in basic, upper secondary, and higher education will drop significantly. Assuming there will be a 95 percent enrollment rate for preprimary and universal enrollment in basic and upper secondary by 2025, fewer basic and upper secondary education places will be needed relative to 2013. On the other hand, Albania's investments in preprimary and primary education are far behind international benchmarks, especially given studies that confirm robust returns to investment in children's early years compared to equivalent investments later in life. Preprimary education will therefore need to be expanded by approximately 36,000 places. Based on current unit costs, creating the 36,000 places preprimary education will need in 2025 would cost about 5 percent of the education budget. Using the same criteria to quantify savings, about 9 percent of the education budget can be saved from the decline in numbers of basic and upper secondary students, which can redeployed to finance the expansion in preprimary. Furthermore, since preprimary classes are mainly housed within primary schools, the places freed by basic education could be used to expand access to preprimary. In particular, the school mapping data collected by the Council of Europe Development Bank project (ALB-IPF-TA-10) should be better utilized. Rural to urban migration and expansion of private education should also be taken into account. For these interventions to produce improvements in quality of preprimary education, continued teacher training and capacity building is needed.

Improve Governance, Efficiency and Equity

Improve management and governance in the education sector (short-term). Sector planning and coordination across different levels of government could be improved to increase transparency and accountability in the use of resources and also enhance policy making and education delivery. Current financing mechanisms and accountability arrangements for pre-university education do not create incentives for schools and local governments to rationalize spending. Limited capacity and lack of a clear monitoring framework exacerbate sector inefficiency.

To bring more transparency and equity to education financing, Albania could consider introducing per capita financing (PCF) to fund pre-university education (short-term). Currently, expenditures per pupil vary substantially by region; and it does not seem that regions with poorer results or a higher incidence of poverty receive more funding. Furthermore, schools depend on the REDs and local governments for financing major inputs and meeting maintenance needs, which impairs their ability to sustain a high-quality teaching environment. The introduction of a well-designed PCF mechanism could not only improve transparency around what regions receive and how that relates to student population, but also efficiency and accountability. It could also help provide additional funding to the disadvantaged and hard-to-reach populations.

As PCF is phased in, in the medium term both school autonomy and accountability should be heightened (short-term). Currently, schools have only minimal financial autonomy. The PISA 2012

school questionnaire shows that only 20 percent of principals reported formulating their school budgets and less than 10 percent said they had autonomy over teacher hiring, firing, and salaries. Albania should consider giving schools more autonomy on both HR and financial management; but this shift will need to be accompanied by investment in building capacity at the local level and greater accountability for results. While this shift is unlikely to have significant budgetary implications, it will require a cultural shift whereby schools, REDs, and EOs will have to perform new roles. In a more decentralized setting, for example, REDs and EOs should act as advisors to schools.

Cost-effectiveness of sub-sector investments could be examined as a basis for reallocating funds. Vocational education students cost the government three times as much per year as general education students, but there is no evidence that there is a concomitant return on the investment in terms of greater learning. Given the tight fiscal space, investment decisions should be driven by benefits that can accrue to both individual children and to society as a whole. For example, preprimary investments can be leveraged to produce positive effects on female labor participation, reach marginalized populations, and reduce the intergenerational transfer of poverty.

Consider Increasing Education Spending over the Medium Term

In the short term, given the lack of fiscal space and the fiscal consolidation plan in place for the period 2014-16, Albania should carry out reforms to make the sector more efficient and do more with the same level of budgetary resources. In the medium to long term, particularly after 2016, Albania should consider increasing public spending on education. Albania's small budget envelope for the education sector should be raised gradually from about 3 percent of GDP to 4.0 percent of GDP, closer to the Eastern European average of 4.6 percent of GDP. While there is agreement that more public spending will not guarantee better education quality, Albania ranks at the bottom with respect to both learning outcomes and public spending on education as a share of per capita GDP. Even after exploiting all efficiency gains, there is likely an additional need for budgetary resources to increase the quality of education and learning outcomes over the long term. The additional public spending could be channeled to several areas in which Albania still needs investment, such as: (i) teachers' professional development; (ii) learning materials and school supplies; (iii) quality of school facilities; and (iv) more time on tasks and activities in schools. While the cost of basic investment in pre-primary education can to some extent be offset by the savings from the declining student population, it also requires well prepared educators, learning materials and school supplies for which additional resources are needed.

Improve Quality of Education

The government could ensure that tertiary education is not expanded at the expense of quality (short-term). The government should strengthen the regulation guiding the expansion of higher education—largely through the implementation of the 2010 law on tertiary education— both to assure quality and to guarantee alignment with population trends. In the last decade, Albania has seen much higher enrollments in tertiary education, both public and private, in line with the government's commitment to providing access to all who wish to continue beyond secondary education. Now it is necessary to direct attention to quality—with a view to ensuring that standards articulated in the 2010 Tertiary Education Law, itself aligned with the Bologna Process and overall

principles of Europe 2020 Strategy—are complied with. It also means that financing has to keep pace with the increase in the number of students, so quality is not jeopardized.

Quality data must be generated and disseminated to the wider public to build evidence and inform policy making (short-term). Currently, there is little evidence on which policies might improve student learning in basic education. Unfortunately, the unreliable household data from PISA does not allow for analysis of determinants of learning outcomes, and causal links have not yet been established between various policy reforms and student achievement. To avoid making policy decisions in the dark, Albania should immediately finalize the design of the EMIS and, once it is in place, use the data in making decisions. This will also help strengthen school accountability. Albania should also seek evidence on policy reforms that have improved student learning in other countries, such as investments in preprimary education, improving teacher and principal effectiveness, and increasing school autonomy and accountability.

Ethiopia PER (2015)

Resource reallocation to improve equity

If the role of public finance is to counteract the inequality in access to education, resulting from unequal income distribution, the government ought to be directing more than 20 percent of public resources towards the lowest income quintile, whereas it is currently directing only 13 percent towards the poorest quintile, less than even the 14 percent share of out-of-pocket expenditure on education contributed by this quintile. At the other pole, 39 percent of the benefits of public education spending goes to the highest income quintile, which contributes 31 percent of out-of-pocket spending. Correcting for this anomaly calls for a reallocation of public education spending, from higher education (which caters largely to the top quintile) to lower primary education (which caters to all classes and disproportionately more to the poorest quintile).

The case for such a reallocation of resources from the highest to the lowest level in the education ladder is made stronger by the following facts: (i) more than half the recurring public expenditure on higher education is on provision of free food and lodging to all students in residence, many of who can afford to bear at least part of this cost; (ii) serious classroom and teacher shortages exist in primary schools in particular regions and districts, addressing which will have high marginal impact on efficiency and school performance; and (iii) improved efficiency at lower primary level will increase the access of pupils from poorer households to higher levels, thereby also contributing to improved equity in the distribution of benefits.

The provision of free higher education services is based on the rationale that the beneficiaries will pay back after graduation and finding employment, through the "graduate tax". However, actual level of cost recovery through this instrument is negligible and is not even being reported in any official publication. Moreover, while the graduate tax is in theory a suitable instrument for recovering the academic cost of providing higher education, the non-academic recurring costs need to be, and can be, recovered more quickly. While it may not be politically feasible to withdraw or cut down on subsidies being provided to university students, it should be possible to at least freeze the aggregate amount of subsidy in nominal Birr, and gradually shift a part of the non-academic recurring cost onto the students, complemented by financial assistance to the few students from lower income households who gain admission in higher educational institutions.

Resource reallocation to improve efficiency

Additional resources for non-salary recurring inputs, provided through GEQIP, have not had a visible impact on average efficiency in primary education, even though efficiency has improved in better equipped woredas and schools. The average has been pulled down by a lagging quarter of the woredas, where efficiency has declined in spite of additional non-salary funding, in the absence of addressing the binding constraint, i.e., teacher and classroom shortages.

The persistence of acute shortages of teachers and classrooms in lower primary education in the case of the lagging quartile of woredas shows that the existing structure of intergovernmental grants is unable to address such shortages, which are concentrated in a few regions and woredas. Formula-based general purpose grants from federal to regional and from regional to woreda governments cannot address such concentrated shortages. Nor can the existing GEQIP school grant in its present design, being distributed to all schools proportional to enrolment.

Some mechanism for transferring teachers from one woreda to another has to be worked out. It should ideally be done in a way that makes it gainful for both parties involved in the transfer, and at minimum additional cost to the public exchequer per transfer. An exchange system could be created wherein woredas that have large teacher shortfalls can post their needs/demands—and those that have extra teachers can choose to offer some on transfer. Suppose a rule is established whereby the donor woreda is required to transfer 90 percent of the budget for Remuneration of Transferred Teachers to the recipient woreda (it could be a time bound contract), on the condition that the latter allocates 10 percent and commits to take on all future increases in salary and allowances. For the Donor, the benefit is the 10 percent immediate saving, plus further saving in the future since the continuing commitment towards the lent-out teachers remains fixed in nominal Birr. For the Recipient, the benefit is the ability to hire additional teachers with minimal initial cost and longer time to mobilise internal financing. For the nation as a whole, the benefit is better utilization of available teacher capacity and hence improvement in efficiency at lower cost (than if all woredas simply keep going after desired PTR targets, as fast as their financing capacity permits).

Ensuring essential inputs and processes to improve quality

Minimum school resources including infrastructure (electricity, water, sanitation), learning resources (textbooks and reference materials) and discretionary funds **should be ensured at every school** as these are factors that have positive impacts on student learning. Schools should monitor the teaching/contact time and reduce the time teachers being in school but not teaching. Teachers' increased efforts in monitoring student attendance will reduce their absenteeism. Teacher professional development should address teachers' pedagogical challenges and increase their knowledge. Strengthening the system quality assurance capacity will likely bring long-term improvement in learning.

Leveraging additional resources for education

Ethiopia's ambitions to become a middle-income country (MIC) by 2025 and its education sector development targets (ESDPV) are admirable, but the achievement of these targets depends on the commitment of all stakeholders: government, families, communities, schools,

educators, and administrators. The resources required are very large, necessitating that all key financiers of the system: the government, families and development partners to step up their efforts.

Given that a steady 20 percent share of the government budget has been allocated to education over the past decade and the medium-term fiscal framework implies a constrained envelope for government spending as a whole, public resources for education are unlikely to rise above the current level of around 4 percent of GDP. However, the relatively low share of education in private household expenditures indicates that additional resources could be leveraged from private sources. Such potential could be tapped in the case of secondary, TVET and higher education.

Analysis of the results of the 2011 Household Income, Consumption and Expenditure Survey shows that a majority of households who send their children to public secondary school have the same spending power as households that send their children to private secondary schools. Yet non-government providers account for less than 5 percent of enrolment in grade 9, and the growth of aggregate supply has failed to keep pace with the growth in demand for general secondary (grades 9-10) education. These facts suggest that it is worthwhile to tap the unused potential for expanding private provision of general secondary education, so as to fulfil the unmet demand with least additional public spending. Higher enrolment of pupils from higher and middle income households in private secondary schools will enable public resources to benefit larger numbers from lower income families.

A subsector where demand has apparently declined due to unfulfilled expectations is TVET, where employment and earnings prospects do not seem worth the investment to many households. Low external efficiency, meaning too few among TVET graduates finding the jobs they aspired for, has been the main reason for the recent decline in enrolment. Developing a partnership with the potential employers could perhaps be a more effective way to address technical training needs and at the same time leverage additional resources from the private sector. A public-private partnership approach is also an option for further expansion of higher education in the future, having already created a significant number of publicly funded universities in the country.

Strengthening credibility of EMIS data

The grade-specific enrolment, repeater and readmitted numbers reported by many of the woredas do not fulfil even a simple consistency criterion, namely, that the drop-out rates implied by the reported data must not be negative. Of a total of over 800 woredas for which EMIS data is available for the five successive years, 2008/09 to 2012/13 (EC01 to EC05), only 37 percent of all woredas in the country are credible and can be used for analysing output efficiency of schools and its determinants. Data submitted by the remaining 63 percent of woredas are not suited for such analysis. Data submitted by schools and woredas need to be checked for consistency and reliability.

Realistic planning and target setting

Education sector goals and targets need to take into account not only the constraints on supply but also on the demand for education. For instance, the fact that enrolment drops as one moves from lower to upper primary education is, to a significant extent, influenced by the opportunity cost of sending 10-14 year old children to school when they could be doing some work and contributing

significantly to family income. While the first milestone of getting all children (or at least 95 percent) to enter primary education in time is within reach in the majority of regions, this is not the case with respect to the second milestone of getting more than 95 percent to complete the primary cycle. Achieving the latter requires not only improvements in service delivery but also easing of the economic constraints on poor households.

Additional primary teacher recruitment needs to be carefully regulated to ensure that it is targeted at those schools/woredas where teacher shortage is clearly a binding constraint to improving efficiency and effectiveness. It is possible to use EMIS data to generate simple indicators of adequacy/inadequacy of (i) teachers and (ii) classrooms, and establish simple guidelines that woreda councils could use while allocating scarce resources. The ratio of Teachers per Section (TPS) = PSR / PTR is a useful indicator. If PTR is much worse than desired target (in a school or woreda) AND TPS is way below 1, then it clearly means that teacher shortage is a binding constraint and of HIGH priority to address. On the other hand, if PSR is much worse than target and TPS is way higher than 1, classrooms/sections are the most binding constraint and of top priority.

Reform options

The following are some reform options for addressing the problems highlighted above:

- Safeguard the financing for the educationally disadvantaged areas and groups to improve their access to education. This should cover:
  - ▷ ECD/pre-schools (to improve the school readiness)
  - ▷ Grade 1-4 (increasing enrolment of the last 10% and reducing drop-outs)
  - ▷ Grade 5-8 (increasing the supply and addressing the demand constraints for the bottom half)
  - ▷ Grade 9-10 (increasing the supply and addressing the demand constraints in rural areas)
  - ▷ Preparatory schools (Grade 11-12), universities and TVET programs: ensure that financial aids are available and used to increase their access to these types and levels of education
- Introduce a cap on the amount of subsidy to cover non-academic costs (on food and lodging) incurred by higher educational institutions
- Reallocate savings on higher education recurring expenditure to initiate a new Special Grant from federal via regions to woredas, targeted at those woredas with most acute shortages of primary teachers and classrooms'
- Establish an appropriate mechanism for transfer of teachers across woredas to reduce the wide inter-woreda variance in PTR
- Establish and publicize guidelines for regions/woredas to ensure that additional teacher recruitment is targeted at those woredas/schools where teacher shortage is clearly a binding constraint
- Within secondary education, shift the emphasis of additional investments from teacher recruitment to the creation of additional classroom space
- Conduct an in-depth study of the demand and supply of TVET training and explore the possibility of a public-private partnership approach to leverage additional resources as well as to improve external efficiency
- Encourage families to invest in learning materials (in addition to their current investment in uniforms, bags and transport)

- Develop a conducive policy framework for expansion of non-government provision in secondary and higher education, thereby leveraging additional resources
- Ensure that data reported by schools and woredas through the Education Management Information System (EMIS) are subjected to adequate and effective consistency checks
- Monitor and analyse the sector financing using unit cost approach. Items within the recurrent expenditures that are deemed essential for the efficiency/quality of delivery should gradually be funded domestically to ensure sustainability
- Build capacity building to analyse several sources of data (administrative reports, census, surveys and in-depth studies) to analyse, triangulate and interpret the data and identify system challenges and potential solutions
- Strengthen the system quality assurance including
  - ▷ assessing students regularly (classroom assessment) and use examination and national (and international) assessment data to provide feedback to schools and policy makers
  - ▷ strengthening teacher training programs (both pre- and in-service) and developing teacher competency validation processes (accreditation, licensing and career development)
  - ▷ using school inspection data to inform school improvement planning, teacher and school leaders' development; and
  - ▷ conducting school effectiveness analysis using student/teacher/school characteristics

⬤ Example 2: Data sources

Overall comment:

Myanmar (2015) flags challenges associated with data availability and quality for different types of data. Few public expenditure reviews address such data challenges in depth. Samoa PER Notes (2014) has an annex dedicated to detailed information on budget-data sources.

Myanmar PER (2015)

The government would benefit from investing early in better data and analysis on coverage, quality and equity to prioritize spending towards the 10 Points Policy. Data gaps pose challenges for effective policy-making, especially because most important decisions are made at the Union level rather than at the subnational level where officials would be better informed of local needs and issues. Establishing a solid framework for data compilation and analysis that feeds into policy-making is a long term endeavor (Box 4.2). In the short to medium-term however, the MoE could enhance the capacity for policy analysis by maintaining three critical databases: (i) Education Management Information System to electronically record administrative data, which is currently collected in paper format; (ii) student learning outcomes, and (iii) budget and expenditure data.

Box 4.2: Data Challenges

- *Education Management Information System:* MoE [Myanmar] currently collects monthly and annual administrative data (e.g. number and type of schools, teachers and students), compiled in a Statistical Yearbook published with 12 months delay. An MIS would improve quality, timeliness, and accessibility of this important information.

- *Household surveys:* These are important sources of estimates on enrollment, drop-out rates, household spending on education, and returns to education among other things. Existing surveys are dated (2009/10) and do not cover the entire country. Census data and new household survey data will become available in 2015. These data provide invaluable information on enrollments and dropouts. To be useful, though, staff in MOE need training to be able interpret and use these data for policy making.

- *Accounting for different education levels:* Many schools that integrate multiple levels (i.e. primary, middle and high school) do not account for spending at each tier (e.g. nearly all middle schools are also primary). Going forward it will be important to separate cost of each tier to accurately assess costs per student at each level.

- *Assessment of student learning outcomes:* There are currently no regular reviews of whether schooling translates into learning at different stages of the education cycle. The Early Grade Reading Assessments (EGRA) and an Early Grade Mathematics Assessments (EGMA) could be instituted to start the process for grades 1-3.

- *Government spending:* Key to monitoring the effectiveness of links between policy and government spending is timely, relevant, and accurate fiscal data. This will involve review of budget classification and broader FMIS. As part of the writing of this PER, data were compiled in a consolidated BOOST database to facilitate analysis. However, this database need to be updated and actively used by budget staff in MOE – a process which will require training and experience.

Samoa PER Notes (2014)

Data Annex

The PER is primarily based on analysis of disaggregated public financial data covering the seven year period between FY06 and FY12, taking advantage of the FinanceOne FMIS system that has been in place since FY06. This analysis represents the first time that the FinanceOne data has been used to produce a consistent public expenditure analysis. To facilitate the analysis of expenditure based on consistent functional and economic classifications some adjustment to the data were made for the purposes of the analysis. While in more recent years, FinanceOne has full coverage based on GFS classifications, these were not fully in place in FY06 and FY07, so the team remapped expenditure by line item using GFS86 as a guide. While the data from FinanceOne has full coverage of domestic expenditure, externally-funded expenditure was recorded most consistently in other systems held by the Ministry of Finance, so data on estimated grant and loan utilization by ministry was added separately to the analysis. Because this information was only available at a higher level, an analysis of donor-funded expenditure by economic classification or detailed functional classification was not possible.

Some further adjustments were made to the FinanceOne data to treat expenditure classifications consistently over the period, to help to illustrate the underlying trends. Firstly, tax expenditure incurred by government ministries that was subsequently rebated was netted off both expenditure and revenue, as it's treatment in the financial accounts changed over the period which would otherwise give the impression both expenditure and revenue has risen. Secondly, some capital items that were recorded above the line were moved into financing in the budget frame. Thirdly, and most significantly, newly incorporated public beneficial bodies, the National Health Service and the Land Transport Authority were reincorporated into the public accounts. This was necessarily since their new status as corporate bodies meant that halfway through the period, their accounts were no longer consolidated in the public accounts ledger, but instead expenditure was in the form of a public grant. The team used the bodies' corporate accounts to reintegrate disaggregate expenditure trends for the period since they became corporatized. The South Pacific Games Authority was also reincorporated into the public accounts to smooth out a temporary spike in transfers to that agency relating to the hosting of the South Pacific games.

The analysis of the public wage bill combines FMIS data with data from the payroll system. It also incorporates payroll data from the accounts of the largest public agencies to present approximate estimates of payroll trends for the whole government for the first time. Similarly, the health analysis represents the first time that unified data for the public healthcare sector has been presented since the creation of the National Health Service as an autonomous agency.

For the education analysis, the data was adjusted for the spike in trends relating to the South Pacific Games in FY07 and for lumpy tax expenditures to establish the underlying structural expenditure trends. The outcome data are mostly based on the Ministry of Education's statistical database. Changes are presented in real terms taking FY06 as the base unless otherwise stated.

In some cases, additional data has been collected from official government sources including the annual Budget Statement, the World Bank's World Development Indicators are used for international comparisons and outcome data and other documents.

⬤ Example 3: Analysis of source funds

Nigeria PER (2015)

Overall comment:

The Nigeria example provides a comprehensive breakdown of education-sector financing by source, including public sources by level of government, private sources, and donor funding.

In Nigeria, 40 percent of the education sector is funded by private households' out of pocket contributions while local government constitutes the second highest share (25 percent). Figure 8 presents the sources of finance by origin. Overall, in 2013, the total cost of the education sector (all levels of education) in Nigeria amounted to 2,329.4 billion Naira (14.6 billion US$). The breakdown of the education sector finance was as follows: federal government (18 percent), state government (13 percent), Local Government Authority (LGA) (25 percent), household out-of-pocket payment (40 percent), Universal Basic Education Commission (UBEC) initiative (3 percent), and donors: the remaining 0.4 percent.

Figure 8: Sources of education sector finance, 2013
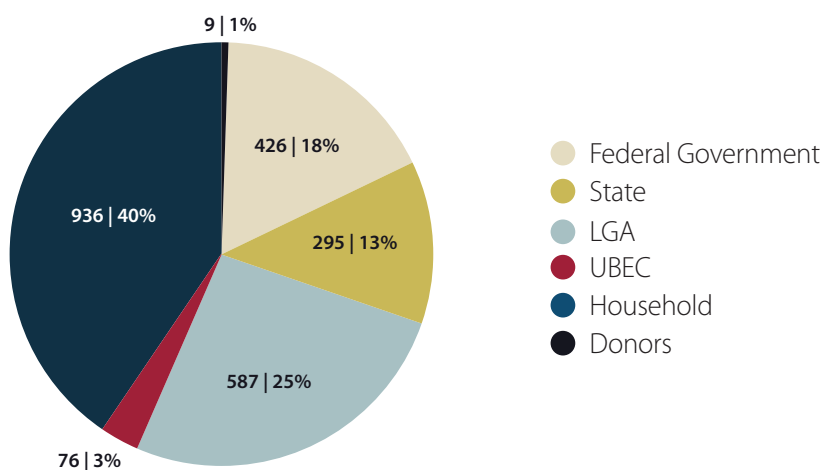
Source: Authors' estimate from CBN, OECD, Nigeria, State Budget, Federal Government Budget, and General Household Survey Panel 2012/13

⬬ Example 4: Analysis of revenue sources

Nigeria PER (2015)

Overall comment:

This example provides a detailed and comprehensive summary of the sources of revenues at all administrative levels in Nigeria and explains the revenue-sharing formula.

Figure 12 shows the structure of basic education financing since the enactment of the 2004 Universal Basic Education Act (UBE). The law preserves the constitutional responsibility of states and local governments in Nigeria to provide basic education and expands the federal government's responsibility in ensuring it is free and compulsory.

The proceeds of the Federation Account are shared among the federal, state, and local governments, in accordance with a revenue-sharing formula and the funding is tracked from the source to the service delivery point. The current formula for dividing up total revenues to government allocates 52.68 percent to the federal government, 26.72 percent to state governments, and 20.6 percent to local governments (Figure 13). The UBE Act was developed based on constitutional mandates, and clearly demarked the financing sources between salary and non-salary.

Figure 12: The structure of basic education financing
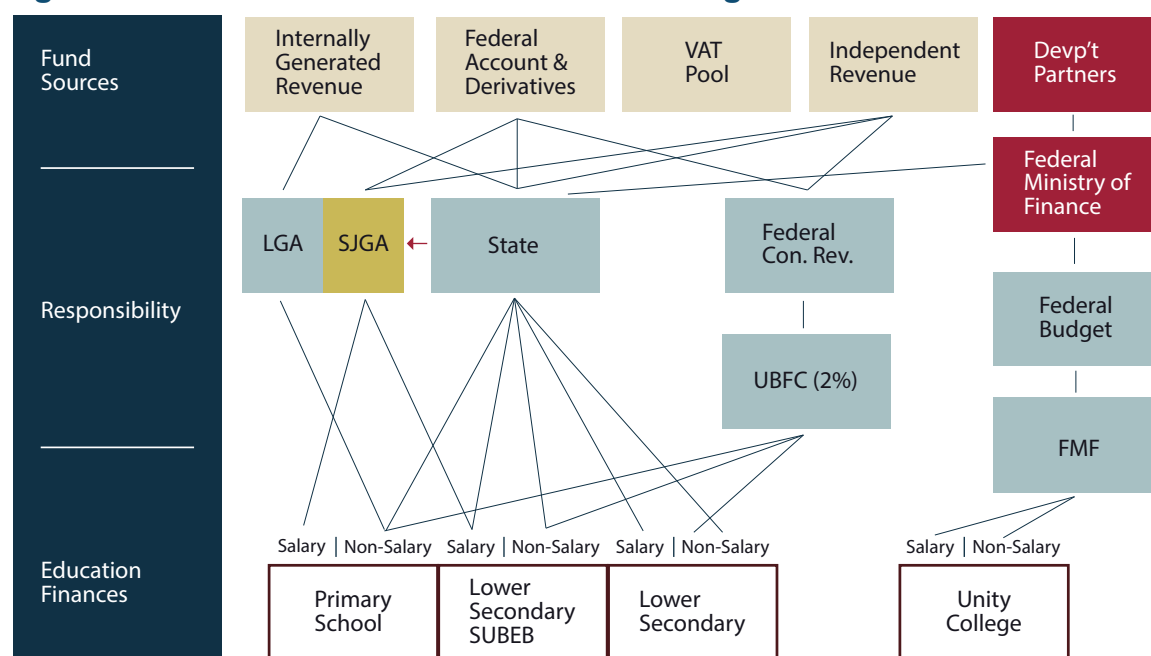
Source: Author's sketch following funding allocation arrangements in UBE following UBE Act of 2004
Note: Each State shall maintain a special account to be called "State Joint Local Government Account (SJLGA)" into which shall be paid all allocations to the local government councils of the state from the Federation Account and from the Government of the State" (Section 162 [6], 1999 Constitution of Nigeria).

Education finance depends to a large extent on federal revenues and the ability of the states to finance education expenditures is directly linked to the availability of federal revenues. Figure 13 shows a summary of the sources of revenue for the three tiers of government. Internally generated revenues for LGAs stand at 1.6 percent while allocation from the state government to LGAs only represent about 0.7 percent of their total revenue. This implies that about 95.3 percent of the LGAs' total revenue comes from statutory allocations, excluding the grants and revenues from the stabilization fund which accounts for the remaining 2.3 percent. Given that salaries are automatically deducted from the statutory transfers at source, this implies that LGAs have, in reality, very little say in education finance, and their role is more symbolic than anything else, given that there is no financial planning or budgeting on their part for the basic education level. At the state level, internally generated revenue (IGR) represents 19 percent of total revenues indicating some potential fiscal space for spending on education based on IGR. In particular, given that the states are responsible for capital and non-salary spending, states' ability to generate more revenue may suggest variations in resource availability across states for basic education spending.

Figure 13: Sources of overall revenues at all administrative levels, 2013

Source	Federal Government			State Governments			Local Governments	Grand Total
	FG's Share	PCT	Sub-Total	States	13%	Sub-Total		
Statutory Allocation	2,777.4	53.5	**2,830.8**	1,435.8	615.0	**2,050.9**	1,107.0	**5,988.7**
Augmentation 1/	351.3	6.8	**358.1**	181.6	101.6	**283.2**	140.0	**781.3**
Share from Excess Crude	208.7	4.0	**212.7**	107.9	60.3	**168.2**	83.2	**464.2**
NNPC Refunds	-	-	**0.0**	44.9	11.9	**56.8**	34.6	**91.4**
SURE-P	191.8	3.7	**195.5**	99.2	55.5	**154.6**	76.5	**426.6**
Share of VAT	106.9	7.6	**114.6**	381.9	-	**381.9**	267.3	**763.8**
FG Independent Revenue	274.4	-	**274.4**	-	-	**0.0**	-	**274.4**
Internally-Generated Revenue	-	11.0	**11.0**	574.9	-	**574.9**	29.3	**615.2**
Less State Allocation to LG	-	-	**0.0**	12.8	-	**12.8**	-	**12.8**
Net Internally-Generated Revenue	-	11.0	**11.0**	562.2	-	**562.2**	29.3	**602.4**
Grants	-	-	**0.0**	69.7		**69.7**	43.0	**112.7**
Share of Stabilization Fund	-	-	**0.0**	1.3		**1.3**	16.4	**17.7**
State Allocation to LG	-	-	**0.0**	-	-	**0.0**	12.8	**12.8**
Others	45.7	-	**45.7**	8.7		**8.7**	-	**54.4**
Total	**3,956.2**	**86.6**	**4,042.8**	**2,893.2**	**844.3**	**3,737.5**	**1,810.0**	**9,590.3**

1/ Includes share of the difference between provisional distribution and actual budget. Note IGR is noted for 12 billion naira and FCT included in state level which make some difference.

Source: Cited from CBN annual report with source from "Federal Ministry of Finance (FMF), Office of the Account-General of the Federation (OAGF), and Fiscal returns from state and lovely governments Survey

Given that the vast majority of basic education salaries come from the federal allocation, which in turn heavily depends on oil, factors that affect oil revenue also directly affect basic education finance. The share of IGR varies greatly by state, and some tend to depend entirely on federal allocation due to low IGR levels. Figure 14 shows (i) total revenue breakdown by IGR; (ii) revenue other than IGR; (iii) the share of internally generated revenues out of total revenue; and (iv) the per capita allocation of non-IGR. The figure shows that share of IGR revenue varies from a low of 1 percent in Benue state (2 % in Borne state) to a high of 41 percent in Lagos. Overall, only four states including Lagos have an IGR share of revenue more than 15 percent of their total revenue—Rivers (22%), Ogun (21%) and Kano (20%). Edo ranks a distant fifth with 14 percent. In addition to Lagos and Kano, five of the 9 Niger Delta states have higher revenue. In general, revenues across states hover around 100 billion Naira, except for the 6 states where it is substantially higher (Lagos, Kano, Rivers, Delta, Akwa-Ibom and Bayelsa). However, since Nigeria has developed an allocation formula justified by rights enshrined in the constitution such as the right of the Niger Delta states to receive 13 percent of oil revenue prior to allocation; resource availability at the state level clearly depends not only on IGR but also on what is being allocated from the federal level.

Figure 14: Sources of educational sector finance, 2013
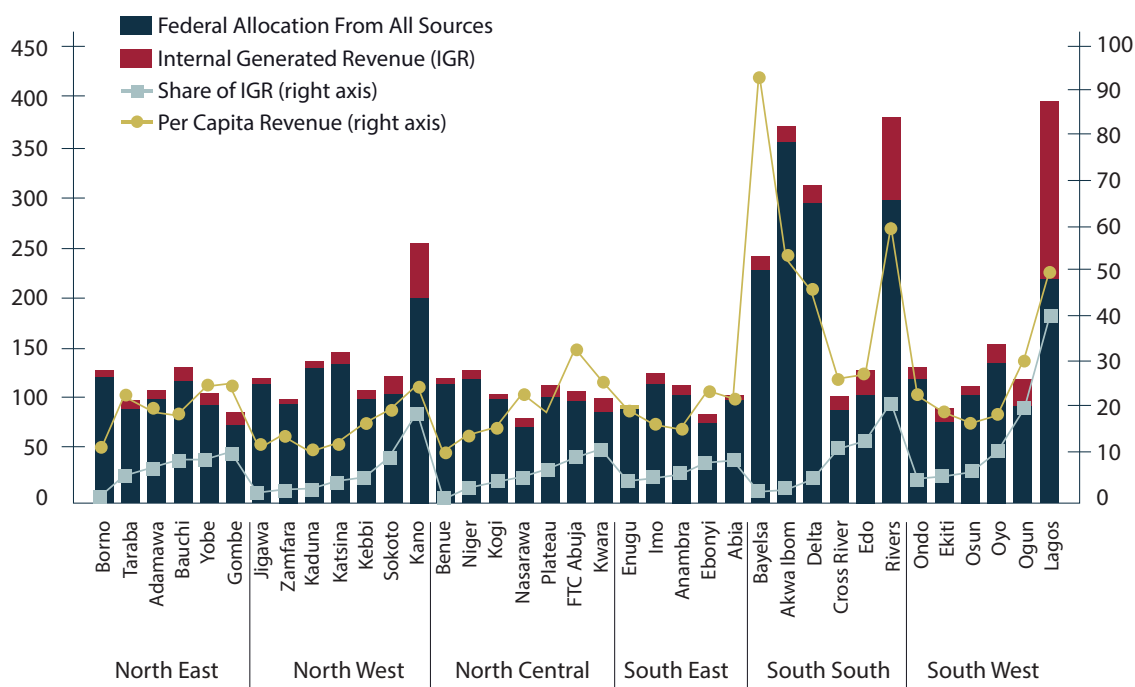
Source: Calculated from CBN Annual report 2013 and Per capital allocation from Monthly Shares of Distribution from The Federation Account By State, Nigeria Economic Report, World Bank Group (2013)

⬤ Example 5: Analysis of decentralized financing

Sudan PER (2014)

Sudan State-level Public Expenditure Review Meeting the Challenges of Poverty Reduction and Basic Service Delivery Synthesis Report, Vol. 1, Summary for Policymakers, May 2014

Sudan State-level Public Expenditure Review Meeting the Challenges of Poverty Reduction and Basic Service Delivery, Vol. 2, Background Papers, May 2014.

Overall comment:

These volumes focus on the strengths and challenges of Sudan's decentralization arrangements. They do not focus on education per se, although this function is decentralized to subnational units and enters into analyses of decentralization processes. As is often the case in studies of decentralization, these studies had to be based on new data collection in the form of case studies of four of Sudan's 17 states.

Sudan highlights several lessons to which education PERs need to be alert.

1. PEFA issues become particularly salient under decentralization because subnational governments tend to vary significantly in the quality of their public financial management. The opportunities for corruption expand accordingly.

2. Subnational governments usually vary, sometimes significantly, in their capacities to raise own revenues. This reality leads to varying gaps between financing responsibilities and resources and the potential for substantial horizontal imbalances between subnational governments that central government should but may not address.

3. Subnational governments often try to collect cost-ineffective taxes—ones that raise little or no revenue, are costly in terms of tax administration, or that are virtually impossible to enforce.

⬤ Example 6: Analysis of education financing by level of government and intergovernmental fiscal transfers

Indonesia PER (2015)

Overall comment:

The Indonesia example provides a focused and detailed analysis of the intergovernmental transfer system and an overview of the education-funds flows in the country.

In Indonesia, district governments are responsible for managing the two main assets at the primary and secondary education levels: schools and teachers. Legally, primary and secondary schools are owned by district governments. In fact, when it comes to budgets, the school's legal status is similar to that of a district government department. Similarly, civil service teachers are legally district government employees, although the hiring process, like that of other civil servants, depends on a number of central government ministries. Provincial governments have very limited authority when it comes to schools, mostly coordinating districts at the basic and secondary levels of education, including with regard to staff development and the provision for education facilities. The central government formulates policy, issues regulations/guidelines and standards at the national level, and still directly controls higher education.

Schools have considerable autonomy over operational, budgetary and programmatic decisions. Since 2003, School Based Management (SBM) has applied to all stages of formal education. A degree of decision-making power and management have thereby devolved to the school level, taking account of local norms and encouraging community involvement.

The funding system for the education sector is complex, involving multiple sources and transfers across various levels of government. Expenditures for education come from central government funds, transfers to subnational governments, subnational governments' own-source revenues, and central government spending at the subnational level that is not recorded in subnational budgets. Currently, schools receive funds from eight different sources and four different budgets, including the national, provincial, district and school budgets (Figure 3).

Figure 3: An overview of the complexity of transfers and fund flows, 2012

Fund Originated from MoD
Fund Originated from MoEC Sectoral Budget
Fund Originated from Provincial Budget
Fund Originated from District Budget
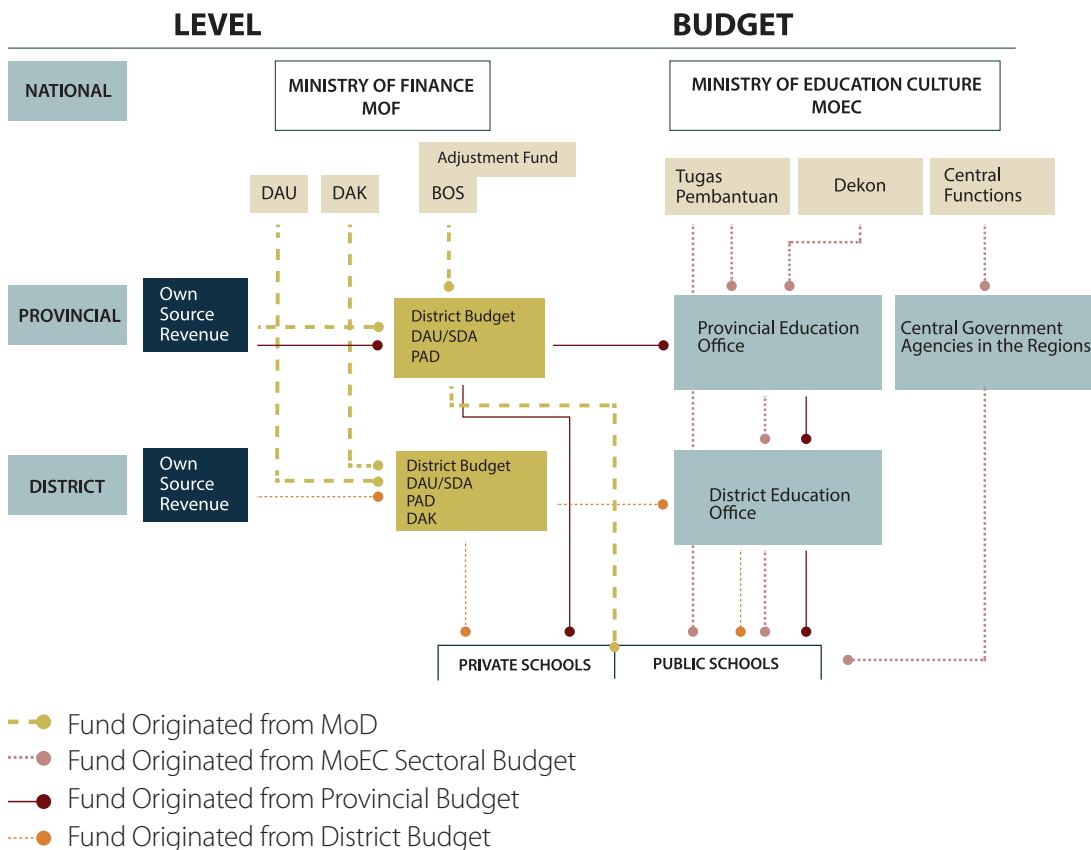
Source: Elaboration based on Permendagri 13/2006 on Guidelines of Subnational Financial Management, World Bank (2009) and Law 22/2011 on AP3N 2012 Note: Adjustment Fund also includes the local incentive grant (Dana Insentif Daerah, or DID)

Central government transfers are the main source of revenue for district government budgets (APBD). Central government transfers to subnational governments have more than doubled in real terms since decentralization, accounting for 88 percent of district budgets and 44 percent of provincial budgets in 2009. While the majority of transfers are not earmarked – making it impossible to determine exactly what they are spent on – transfers are estimated to finance about 90 percent of subnational spending on education, and 60 percent of the total national education budget.

Subnational governments receive many types of transfers for education spending. The main transfer to subnational governments is the General Allocation Fund (Dana Alokasi Umum, DAU) block grant, which provides funding for the salaries of district civil servants, including civil service (PNS) teachers. DAU transfers represented about 60 percent of district and 20 percent of provincial budgets in 2009. The DAU is allocated through a two-part formula consisting of the "Basic Allocation" and the "Fiscal Gap" (See Box 1 for details on each transfer type). The Basic Allocation, which is calculated largely based on the salary bill for civil servants in the district or province, implicitly incentivizes civil service hiring. Covering about 72 percent of the salary bill, it accounts for about 45 percent of the total DAU.

In 2009, districts accounted for 50 percent of total national education expenditures, while provincial governments accounted for only 8 percent. Salaries are a major component of district spending. When salaries are excluded, education spending is still largely centralized. The central government controls the majority of the non-salary budget at all levels of education, from the 70 percent in ECD to 99 percent at the university level. Even in basic education, almost 90 percent of non-salary spending still occurs at the central level. What brings down the overall average to 67 percent is unclassified spending at the district and provincial levels.

Figure 12: Spending by level of government, 2001-2009

Central   District   Province
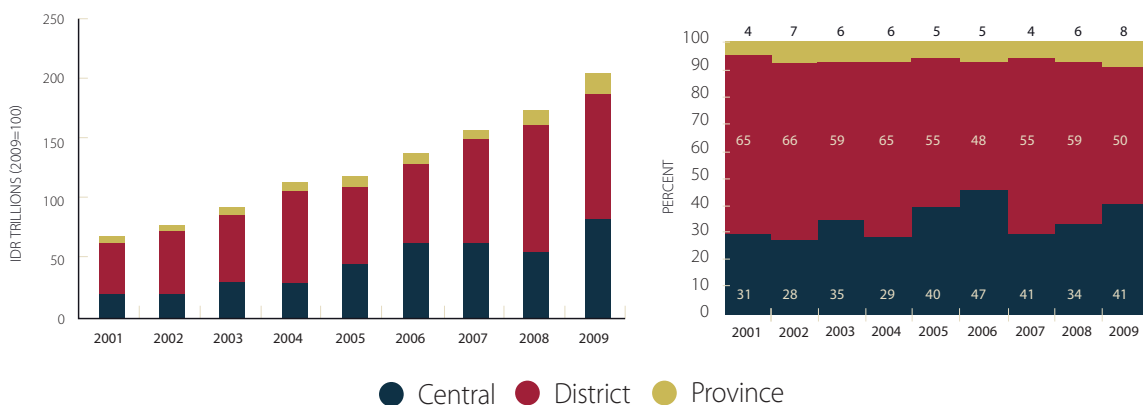
Source: World Bank staff estimates based on state budget data and Regional Financial information system data (Sistern Informasi Keuangan Daerah, SIKD), Ministry of Finance

Figure 13: Non-salary education expenditure by programs and level of government, 2009

Central   Central-80S
District   Province

Sources: MoF

Central   District   Province
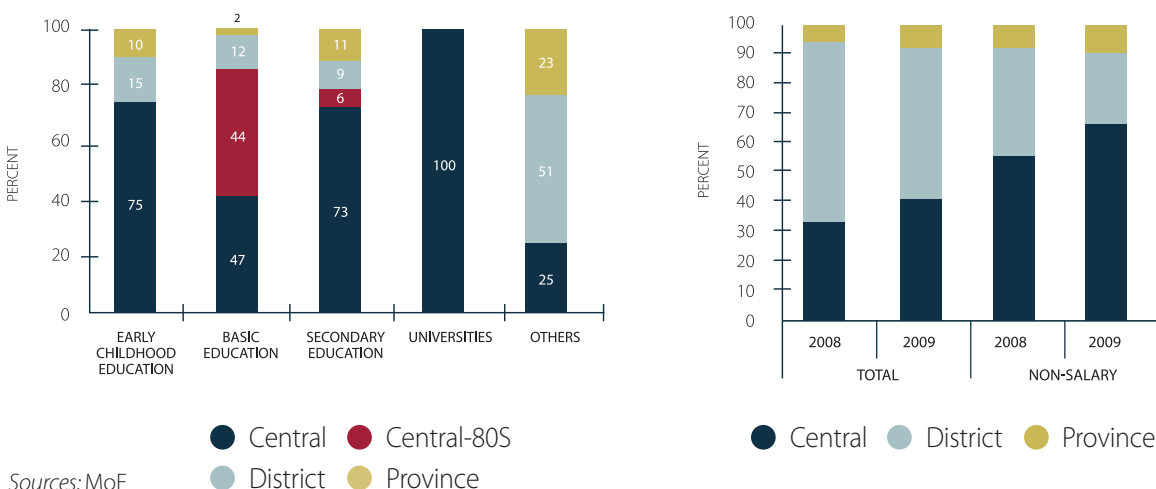
Box 1: An Overview of Current Transfer Mechanisms in the Indonesian Education System From the Central to Subnational Governments

This box provides a brief description of the objectives and means by which the various transfer mechanisms from the central government to subnational governments within Indonesia are determined. These transfers represent the major source of financing for subnational governments and thus, to a large extent, explain the level and composition of their spending.

General Allocation Fund (Dana Alokasi Umum, DAU)
The DAU, according to Law No. 33/2004 Article 1 (21), is a discretionary block grant sourced from the Central Budget (APBN) and aims to equalize the fiscal capacities of subnational governments. It is transferred monthly and directly from central to subnational governments. The DAU is allocated based on a national formula and is the sum of a basic allocation (a portion of the subnational budget for public servant salaries) and the "fiscal gap" (the difference between the estimated fiscal needs and fiscal capacity) of the subnational government. The basic allocation accounted for about 45.5 percent of the DAU in 2010. Fiscal needs are based on regional variables such as population, area, GDP per capita, and the human development index. Fiscal capacity is measured by a region's own-source revenue and a fraction of total revenue-sharing. Based on Government Regulation No.55/2005, provinces only receive 10 percent of the total DAU, while districts receive 90 percent.

Specific Allocation Fund (Dana Alokasi Khusus, DAK)
DAK is an earmarked grant allocated to finance specific investment expenditures that are aligned with national priorities and carried out under the jurisdiction of subnational governments. The DAK cannot be used for research, training, administration, or official travel. In 2011, 19 economic sectors received DAK allocations including education, health, agriculture, forestry, trade and various infrastructure sectors (road, irrigation, water, sanitation, rural electricity, housing and local government and remote areas infrastructure). Education is a key priority for DAK spending, with about 40 percent of DAK transfers allocated for education and used primarily for school rehabilitation and quality improvement. The DAK allocation has a formula component that takes into account the fiscal gap and has a 10 percent matching requirement. DAK is transferred in three tranches: the first is allocated after the budget is submitted to the central government; the next two depend on the depletion of the previous tranche. Although DAK is earmarked to fund capital spending, the government allowed some routine maintenance expenditures.

Revenue Sharing Fund (Dana Bagi Hasil, DBH)
Unlike DAU, which is a horizontal equalization grant, DBH is a vertical equalization grant which consists of revenue sharing from natural resources and taxes. Local governments are obliged to use 0.5 percent of their receipts from the natural resources part of DBH on basic education." DBH represented approximately 20 percent of total subnational government revenues in 2009.

Special Autonomy and Adjustment Funds
Special Autonomy Funds include specific grants for Papua, Papua Barat and Aceh (Dana Otsus) and Special Adjustment Funds (Dana Penyesuaian) which include additional allowances for teachers, such as professional benefits for certified teachers and for uncertified civil service teachers, a School Operational Assistance program (Bantuan Operasional Sekolah, or BOS), and local incentive grants (Dana Insentif Daerah, or DID) for education.

Central government spending at the subnational level not recorded in subnational budgets (APBD)
De-concentration (Dekon) and Co-Administered Tasks (Tugas Pembantuan, TP) Dekon and TP funds originate from the central government's budget (APBN), and are administered by the provincial Dinas. The funds cover a variety of projects and activities, including school and classroom reconstruction and school quality improvements, social assistance programs (which included BOS until 2011) and capacity building programs for civil servants.

Sources: MoF and various laws

⬤ Example 7: Analysis of school budget by financing source

Philippines PER (2015)

Overall comment:

This PER investigated the effects of school-based management (SBM) in basic education in the Philippines. Among other questions, it used survey data from three provinces to assess whether SBM alters the resources available at the school level. Using the school-level financing data generated by the survey, the analysis addressed these questions: How has the resource situation at the school level changed in recent years? What is the financial resource situation of schools and what use is made by schools of SBM grants? What resources are schools able to mobilize in addition to Department of Education (DepED) transfers? Does the SBM grant act as a catalyst for the school to access other resources? What uses are made by the school from existing sources? What is the variation in pattern of uses from different sources? What is the relationship between resource allocation and school performance, and what can be done to improve the efficiency and equity of resource allocation? What has been the resource allocation trend in the past few years? What do we know about the equity of resource allocation across schools? What factors contribute to inequality in resource distribution? What is the role of Local Government Units (LGUs) in supplementing the financial resources available to schools?

Conclusions assembled from the PER

▸ **The analysis of school survey data collected in three provinces shows several interesting observations related to the improved availability of financing at the school level.** First, the proportion of budget raised by LGUs and communities has been increasing in our sample schools, which is consistent with the expansion of SBMs. There does appear to be some evidence of the so-called 'fly – paper effect' where central grants stick to the recipient and overall resource position of the school improves. Parent-Teacher-Community Association (PTCA) funds appear to be higher in the year following a school receiving a SBM grant. Second, the gap between planned and actual budgets looks smaller among schools that perform well in SBM.

▸ **Financial decentralization to schools has doubled, but at PHP 450 per pupil per year for elementary schools and PHP 965 per year for high schools, school level funds account for only about 5% of overall basic education spending.** The sample survey data from 2010 indicates that high schools received about PHP 500,000 from various sources and elementary schools received an average of PHP 134,000 pesos. About 60-70% of these resources come from DepED in the shape of annual capitation grants for maintenance and operational expenses and occasional SBM grants. DepED should consider accelerating the pace of resources transferred to the school level.

Analysis behind the conclusions

Survey data reveals that school level resources have increased indicating growing school financial empowerment but not substantial school level financial decentralization. An increased share of resources is managed at the school level compared to total national government spending on basic education in the last five years. Funds managed at the school level have grown in absolute and per pupil terms during the last five years. School level resources were almost double among the sample high schools at PHP 965 per student in 2010 when compared with only PHP 449 per student among the sample elementary schools (in nominal terms). Average real per student school-level managed funds doubled from just under PHP 200 in 2007 to nearly 400 pesos in 2010 in the survey sample schools (in constant 2005 prices). Nevertheless, compared to the national average spending per pupil, school level managed resources remain a small proportion of 5.4 percent in 2010.

In the sample schools, the overall size of school managed funds has grown from 2006 to 2010 even as Department of Education (DepED) share of school level resources has not increased substantively in the survey schools. It is important to understand how much of these increases in school level managed resources represent a deliberate trend towards financial decentralization by DepED versus a voluntary increase in contributions towards capital expenditures, teacher salaries and various Maintenance and Other Operating Expenses (MOOE) by local government units (LGUs), Parent Teacher Community Association (PTCA) and the community. If this trend were to represent the results of a deliberate strategy by DepED to give increased financial autonomy to schools, the role of DepED grants including school MOOE, School Based Management (SBM) and School Based Repair and Maintenance Scheme (SBRMS) grants would increase over time.

Table 3.3 illustrates that DepED resources have hovered around 70% of total school level resources. While the share of resources the school is able to mobilize from local and community sources as compared to what it receives from DepED in terms of MOOE, SBM and SBRMS grants has fluctuated slightly in the last five years, it has always been between 25 to 30 percent of total school resources (except 2010).

Table 3.3 Sources of school level funds (mean values in constant 2005 PHP)

	2007		2008		2009		2010		2011*	
DepED	53,000	70%	71,000	76%	98,000	73%	124,000	59%	119,000	73%
PTCA	15,000	20%	15,000	16%	21,000	16%	31,000	15%	21,000	13%
LGU	2,000	3%	3,000	3%	6,000	4%	28,000	13%	12,000	7%
Community	-	-	1,000	1%	2,000	1%	7,000	3%	6,000	4%
Others	5,000	7%	2,000	2%	9,000	7%	20,000	10%	4,000	2%
Total (%)	**76,000**	**(100)**	**93,000**	**(100)**	**135,000**	**(100)**	**209,000**	**(100)**	**162,000**	**(100)**

Source: 3D-SFSD. *2011 data not complete. ** Figures have been rounded off to the nearest '000

The financial role of LGUs in basic education has been growing in keeping with DepED policies to enable deeper partnerships between DepED and local government units. Table 3.3 indicates that in 2010, the share of non-DepED school level funds rose to a high of 41 percent of total school managed funds. This was driven by LGUs contributing a substantially greater amount of 8.9 percent of per pupil school level funds (up from 6.6 percent in 2007). A possible hypothesis to explain this is that 2010 was an election year, causing local governments to spend more on basic education as a strategy to win votes. It remains to be seen whether LGU funding for basic education as a whole and as a share of total basic education funding continues to increase in real terms post 2010. Of the four major sources of funds that the school can manage, funds contributed by the parent-teacher association (PTCA) form the highest share every year, although the percentage varies between 33 to almost 75 percent of school mobilized non-DepED funds. Nevertheless, about one-third of the sample schools either did not receive any PTCA funds or did not maintain records of these funds in 2010. Further investigation is required to determine if this is an effect of the no-collection policy issued in 2009 which was strictly enforced by DepED from 2010.

The surveyed schools did receive some in kind resources in 2011 but the estimated value of these resources was very small at only 0.7% of total funds received by the school. Data on in-kind resources were collected only for the year 2011 and the analysis shows that the only source from which in kind resources form a bigger portion of their contribution was donors, where in kind resources were 18% of total donor contributions. When data about municipal per capita income is included, we find that the richest municipalities received significantly more at 4.5 times the amount in terms of the value of in kind resources as compared with the schools in the poorest municipalities. However, the value of in kind resources received by schools with higher SBM levels of implementation was not significantly different from that received by schools with lower SBM levels of implementation.

The proportion of schools that receive the SBM grant annually is growing but still remains small. In 2011 only 20 of the 150 survey schools received the grant (only 2 schools received it in 2007). Three of the 150 schools received the SBM grant in two years. No sample school received the grant more than twice. The percentage of funds represented by SBM grants for those schools that did receive the grant has remained at about one-third of total school level funds in the last three years. The number of schools that received school MOOE grants has increased substantially in the last five years from merely 13 in 2007 to 115 schools in 2011. The percentage of funds represented by school MOOE grants for those schools that did receive the grant has remained at about 60 percent of total school level funds in the last three years. All the schools have school MOOE allocation, and the allocation per school is posted in the DepED website. However, during school visits in the implementation support for National Program Support for Basic Education (NPSBE2-SPHERE), it was observed that there were still schools which: a) opted not to get their MOOE allocation but instead requested their Division Office to provide the Division-procured supplies based on their list of requirements or requested Division to pay their utility bills directly; b) did not request their allocation because of large unliquidated cash advance; or c) the Division decided not to provide the allocation for the same reason.

An analysis of the sources and uses of funds data for 2011 shows that a greater proportion of school level resources for survey schools that ever received a SBM grant was from LGUs and PTCAs. We can see from Figure 3.2 below that schools that ever received the SBM grant received an average of 26,331 pesos from LGUs in 2011. The average LGU funds in 2011 received by schools that were never SBM grant recipients were much lower at about 7,000 pesos. SBM grant recipient schools were also significantly more likely to raise higher resources from PTCAs in 2011- an average of 49,700 pesos compared with an average of 17,000 pesos for schools that never received the SBM grant. However, SBM grantees mobilized fewer resources from community and other sources compared with non-SBM grantees.

Figures 3.2: Sources of funds: 2010

Source: 3D-SFSD
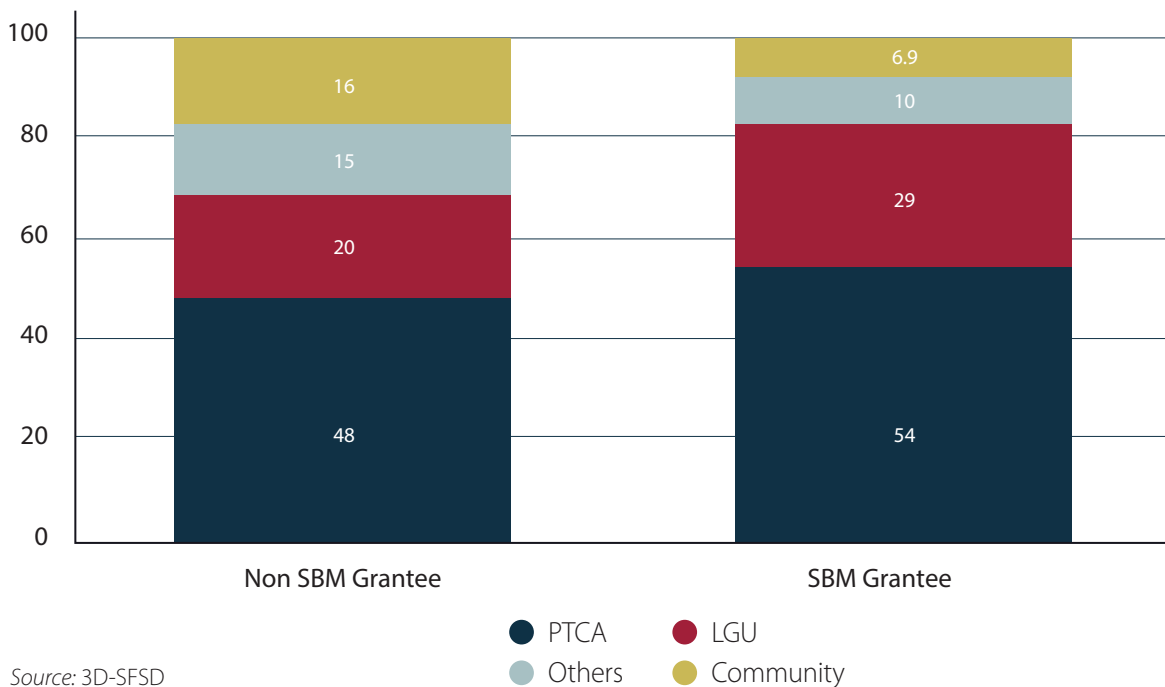
⬤ **Example 8: Analysis of household surveys on private spending**

Mali PER (2016)

Overall comment:

This example provides a comprehensive and broad overview of household spending on education. It includes information on the share of household spending as part of total education expenditure in Mali; international comparisons on private spending in education (as a share of gross domestic product) based on UNESCO Institute of Statistics data; share of household budget spent on education by region; and the composition of household spending on education by region and socioeconomic group. The analysis at subnational level reveals significant variance in how much households spend on education and how they allocate this budget.

Household data suggests that in 2014, households in Mali spent approximately CFA 28 to 31 billion on education expenditures, or approximately 8 to 10 percent of all education expenditures.[a] Private spending on education, estimated in this manner, is roughly equivalent to 0.6 percent of Malian GDP (and this estimate is identical to UIS estimate from 2009). To put this number in context, UIS reports private sources account for 2.4 percent of GDP in Benin, 2 percent in Burkina Faso, 1 percent in Burundi, 0.3 to 0.4 percent in Malawi and Niger and 1 percent in Guinea.

Households generally spend about 1 percent of their budgets on education, and 65 percent of this expenditure goes to pay for tuition and school fees. How much households spend on education and how they allocate this budget varies greatly from region to region, reflecting both income disparities and disparities in access. Households in Bamako collectively account for half the private spending across entire Mali; households in Mopti, Gao, and Tombouctou incur only 6 percent of all private expenditure, when combined together (Appendix Figure 29). This skewed spending is the result of many disparities including more children, more schools and more income in Bamako. The disparities are also apparent in the share of household spending on education. In Bamako, households allocate 1.75 percent of their budgets to education (twice the national average) whereas in Mopti and Tombouctou, this share is only about one tenth of a percent.

**Appendix Figure 29:
Share of total household expenditures, by region**

- 50% Bamako
- 2% Gao
- 10% Kayes
- 10% Koulikoro
- 2% Mopti
- 11% Segou
- 15% Sikasso
- 2% Tombouctou
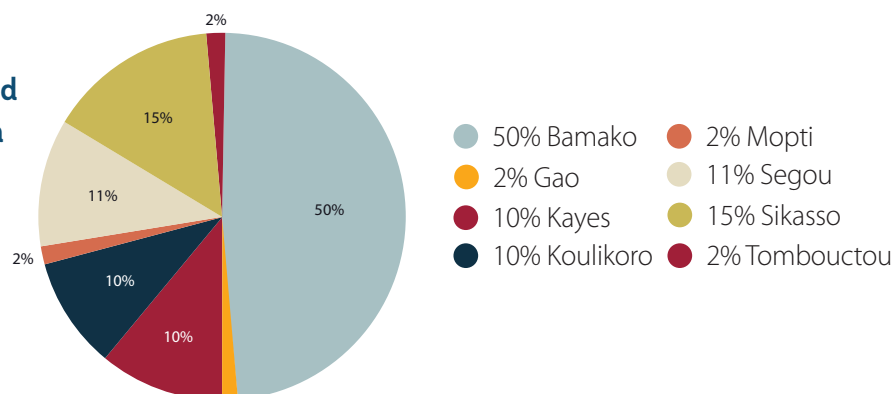
Source: EMOP 2014

Figure 52: Share of household budget spent on education, by regions, 2014

TOMBOUCIOU .13%

GAO .41%

KOULIKORO .51%

MOPTI .11%

KAYES .50%

BAMAKO 1.75%

SEGOU .63%

SIKASSO .79%
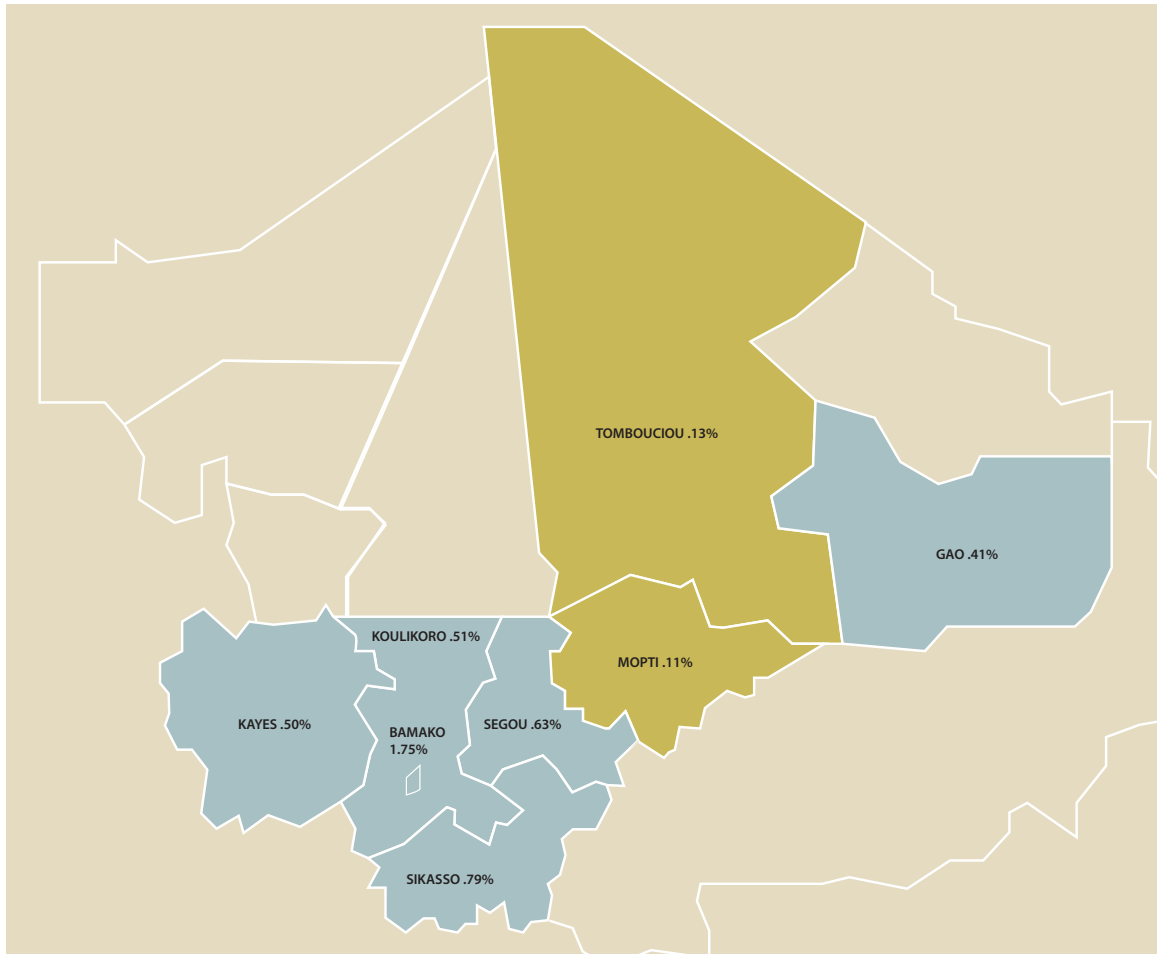
Source: EMOP 2014

Tuition and fees constitute the largest share of household education expenditures. In 2014, this category accounted for 62 percent of all education expenditure. Books follow at 29 percent. All other education expenditures (tutoring, supplies, transportation, etc.) account for less than 10 percent. Books and supplies are a much higher share of household expenditures in rural areas (where school fees are lower and private schools are rare. Across rural Mali, households allocate nearly half of their budgets to books and supplies whereas the similar share in urban areas is only 26 percent (Figure 53).

Not only urban Malians spent nearly twice as much on education (in nominal terms) they also allocated a much larger share of their income on tuition and fees. Once again, this is an indicator of not just household capabilities, but also availability of schooling. The urban households include

private schools as well as upper secondary and tertiary schools that tend to have higher fees. The same thing holds true for households under the poverty line (they spend half their education budget on tuition, and other half on books and supplies) compared to households above poverty line (for which, tuition and fees are 64 percent, see Appendix Figure 30).

Figure 53: Distribution of household spending on various education items

Mali

Rural

Urban

- ● Tuition & Fees
- ● Books
- ● Tutoring & Other
- ● Supplies
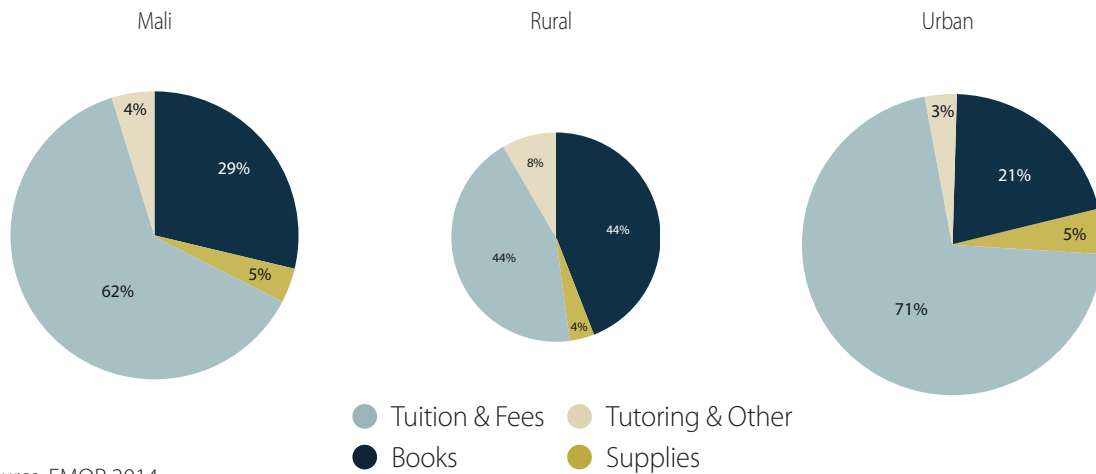
Source: EMOP 2014

Appendix Figure 30: Household expenditures in education, size and share, different socioeconomic groups

Below Poverty Level

Above Poverty Level

- ● Tuition & Fees
- ● Books
- ● Tutoring & Other
- ● Supplies

No Education

Complete Primary

Complete Secondary

Complete Post-Secondary
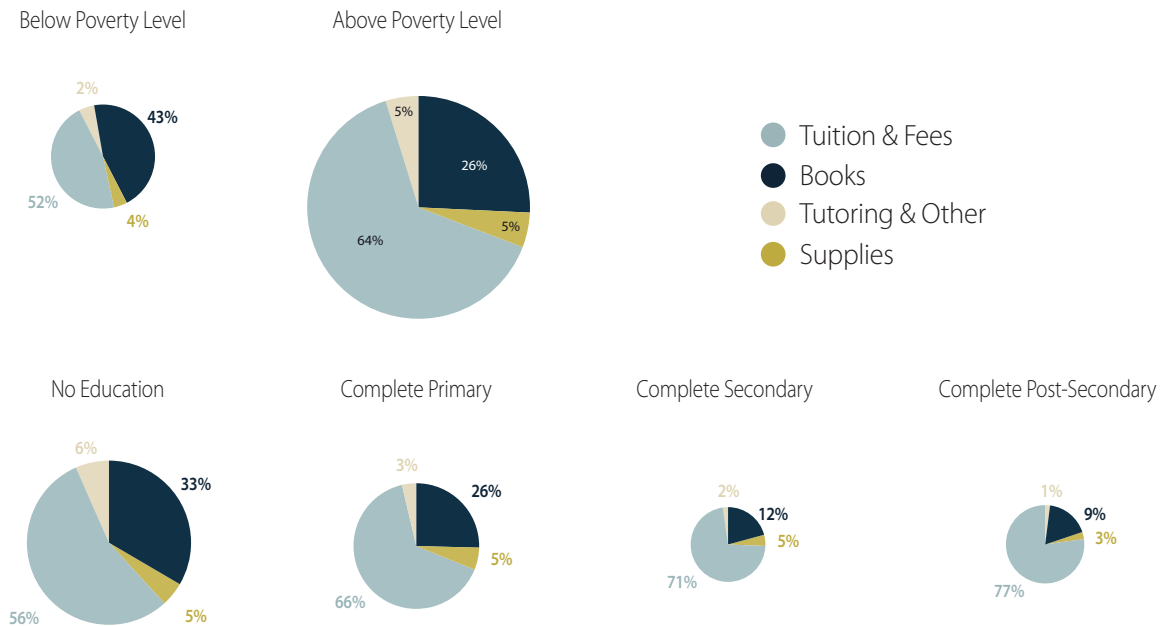
[a]This estimate is based on the estimated average household expenditure on education from the most recent Enquête Modulaire et Permanente Auprès des Ménages (EMOP) data (2014 last quarter), which covers all parts of the country except for Kidal.

⬤ Example 9: Analysis of donor funding

Mali PER (2016)

Overall comment:

This provides a good example of how to address financial sustainability issues related to donor funding fluctuations. It provides analysis of donor funding before and after the political crisis in the country, examines the role of donor funding (donor activities), and mentions issues related to finding good international or regional comparisons on this source of funding, due to lack of a consistent definition of official development aid (ODA).

Mali relies on funds provided by international donors, especially for capital investments. Through 2010, international funding had accounted for nearly a quarter of all budgeted education expenditures. Several international and bilateral donors and NGOs supported the education sector, and the focus of support was largely on school construction, school canteens, teacher training and quality improvements in general, with a strong focus on the south (Table 9).

Table 9: Summary of main pre-crisis donor activities

Agency	Domain of Intervention	Geographic Area
The Netherlands, CIDA (Through NGOs and Firms)	Quality improvement (reading and writing; textbooks)	Kati, Koulikoro, Segou, Mopti
UNICEF	Teacher training, early childhood development (ECD) support, School construction	Bamako, Segou, Mopti, San, Kati, Kayes
Save the Children, Plan Mali, Handicap International, Aga Khan Foundation, Right to Play, Islamic Relief, CRS, BIT, GARDL, JICA	School canteens, support to CGS, school construction, ECD	Countrywide but inadequate to meet all the needs
World Food Program (WFP)	School health and feeding program	Bamako, Segou, Mopti, San, Kati, Koulikoro
USAID	Scholarships	Tombouctou, Gao, Kidal

Source: Emergency Basic Education Program PAD

Since 2004, donor funding, on average, equaled 0.8 percent of Mali's GDP. Because there is no consistent definition of official development aid (ODA), it is hard to provide international comparisons.

One study puts the average official development aid for education at 5.6 percent of total government expenditures in education across Sub-Saharan Africa but the proportion of ODA in public education resources varies greatly across the region (UNESCO, 2013). For example, in 2008, 72 percent of total education funding in Liberia was financed externally; the comparable share was 42 percent in Ethiopia, 35 percent in Eritrea and Burundi, 26 percent in Niger, 24 percent in Central African Republic, 9 percent in Togo, and 3 percent in Democratic Republic of Congo (all very low income countries like Mali).

Donor funding could be unreliable. It completely disappeared in 2012 due the political crisis. Before the crisis, donors had committed upwards of CFA 350 million to PISE III, but according to budget records, only CFA 262 billion, or 85 percent of these funds were received (See Box 4 on the importance of external funds in Mali's capital improvement plan). After the coup d'état and suspension of aid, donors support to the sector was channeled mainly through UNICEF, NGOs and other direct financing interventions for short-term humanitarian and recovery response. Donor support in education has resumed since the end of 2013, but is not back to normal yet. 2014 and 2015 budgets once again include donor funding, which is expected to pay for approximately 3 to 6 percent of budgeted expenditures (Figure 45).

Figure 45: Importance of donor finding, over time
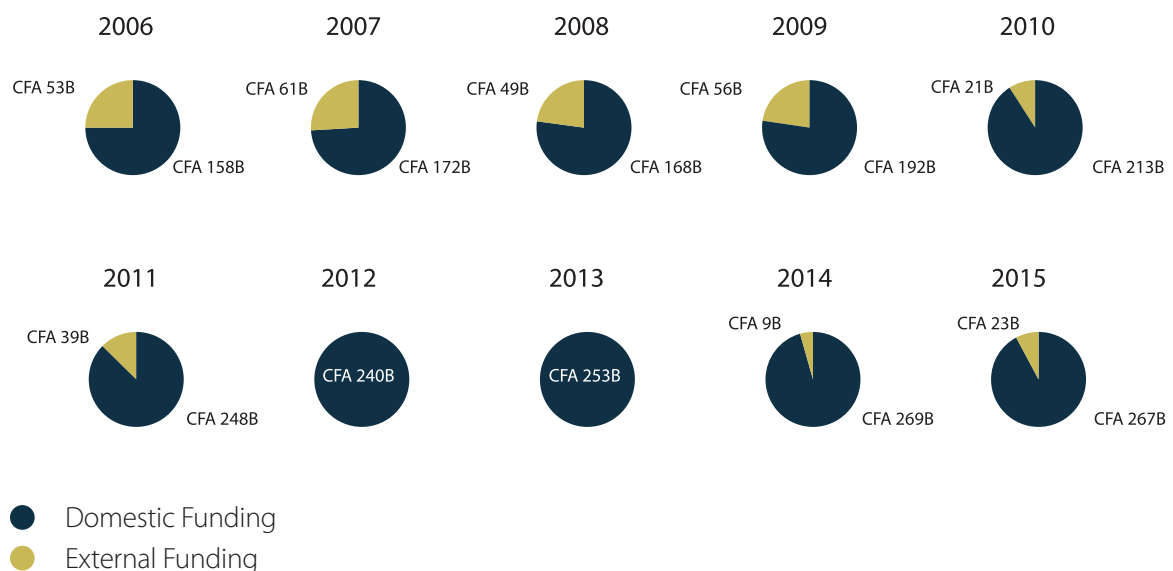
Source: International Donor Funds, in 2015 CFA

⬤ Example 10: Analysis of total public education spending

Albania PER (2014)

Overall comment:

This analysis of education expenditure as a share of gross domestic product, total government spending, and per capita spending, provides good international benchmarks based on similar demographics, such as similar shares of school-age populations.

Public spending on education is particularly low considering the composition of Albania's population. About one-third of Albanians are 19 or younger. Table 2.7 shows that Albania compares unfavorably with most other countries with similar shares of school-age population. Even poorer countries like Morocco and Vietnam invest more of their income on education. Public spending per student is among the lowest in Europe even taking into account Albania's income level.

Table 2.7: School-age population and public spending on education

	Country	Share of population below 19 years old (%)	Public expenditures on education as share of GDP (%)	Public expenditures on education as share of total Government expenditures (%)	GDP per capita (PPP)
Europe and Central Asia	Albania	32.5	2.9	9.5	9,403
	Kazakhstan	33.5	3.1	-	13,667
	Azerbaijan	32.7	2.4	7.2	10,125
	Armenia	29.1	3.1	13.7	8,417
	FYR Macedonia	25.0	-	-	11,834
	Serbia	23.7	4.4	10.6	11,801
	Croatia	21.0	4.9	9.9	20,964
OECD	Mexico	39.7	5.3	19.4	16,734
	Chile	30.8	4.1	19.4	22,363
	New Zealand	27.8	7.3	18.7	32,219
	Ireland	27.5	6.5	9.8	43,683
	United States	26.9	5.6	12.7	51,749
	Peru	39.8	2.6	18.1	10,765
	Morocco	38.3	5.4	-	5,220
Other Countries	Colombia	38.2	4.4	15.8	10,436
	Brazil	33.9	5.8	18.1	11,716
	Vietnam	33.6	6.8	20.9	3,787

Source: World Development Indicators, UN DESA Population Projections and UNESCO Institute for Statistics
Note: Population figure are 2010 estimates. Expenditures are 2010 or latest available and GDP per capita is from 2012.

⬭ Example 11: Analysis of functional classification

Honduras PER (2015)

Overall comment:

This analysis examines education expenditures by functional classification--i.e., level of education or subsector. It provides comparisons with countries at similar stages of economic development and provides international benchmarking for changes in the composition of spending by level of education as the country develops.

In Honduras, primary education takes up the bulk of public spending on education, but this share is expected to fall as the country develops. Pre-primary and primary education[a] alone represents 51 percent of all educational expenditures, while, on average, a quarter of the budget is devoted to secondary education and around 15 percent to tertiary education. This distribution is in line with countries at similar stages of economic development, such as Guatemala and Nicaragua (Figure 14).

However, countries with a higher level of economic development tend to show more balanced spending across levels, with their spending on primary education ranging between a minimum of 20 percent and a maximum of 35 percent. Therefore, as Honduras develops, international benchmarking suggests that public spending on primary education should decrease in relative importance compared to other educational levels, even if public spending on primary education increases in absolute terms.

Figure 14: Public spending on education by level, selected countries sorted by GDP per capita (circa 2013)
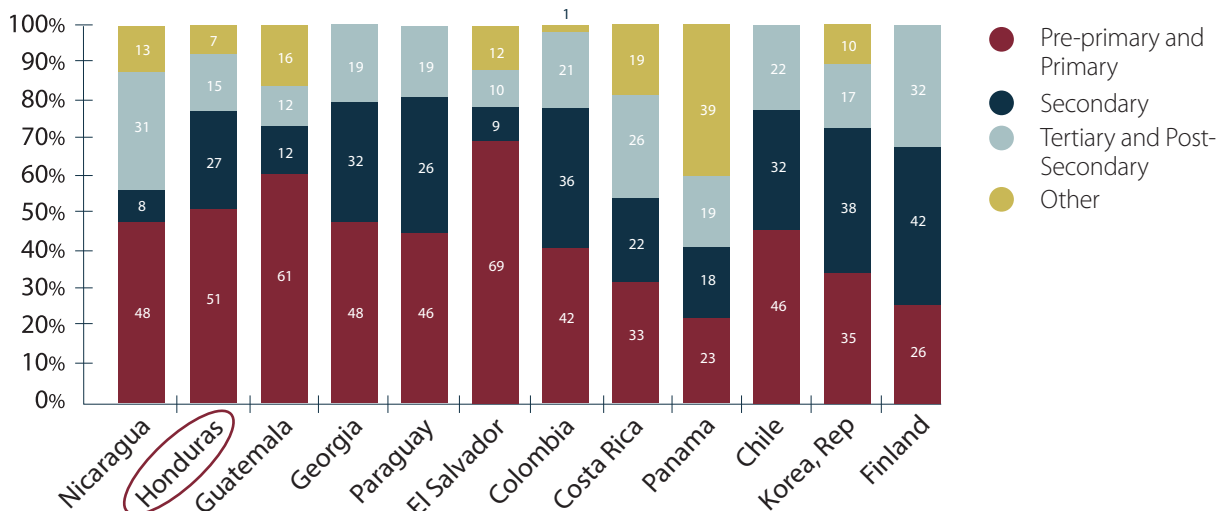
Source: World Bank/ICEFI social spending database for CA countries; EdStats for the rest of the countries.

Kenya PER (2014)

Overall comment:

A functional analysis shows that Kenya's university subsector receives a disproportionally large share of the current sectoral budget in contrast to primary education. These relative shares raise serious questions about equity and almost certainly about efficiency.

Intra-sectoral composition in the education sector can benefit from rationalization in order to enhance efficiency and equity. The education budget allocation in 2014/15 is skewed in favor of tertiary education at over 40 percent of the total sector budget, which compares unfavorably to 26 percent allocated to primary education.

A functional analysis shows that Kenya's university sub-sector receives 39 percent of the current sectoral budget in contrast to 26 percent for primary education (grades 1-8). These relative shares raise serious questions about equity and almost certainly about efficiency.

Figure 1.21: Current expenditure composition in education could undermine efficiency and equity

Total education sector budget, 2014/15
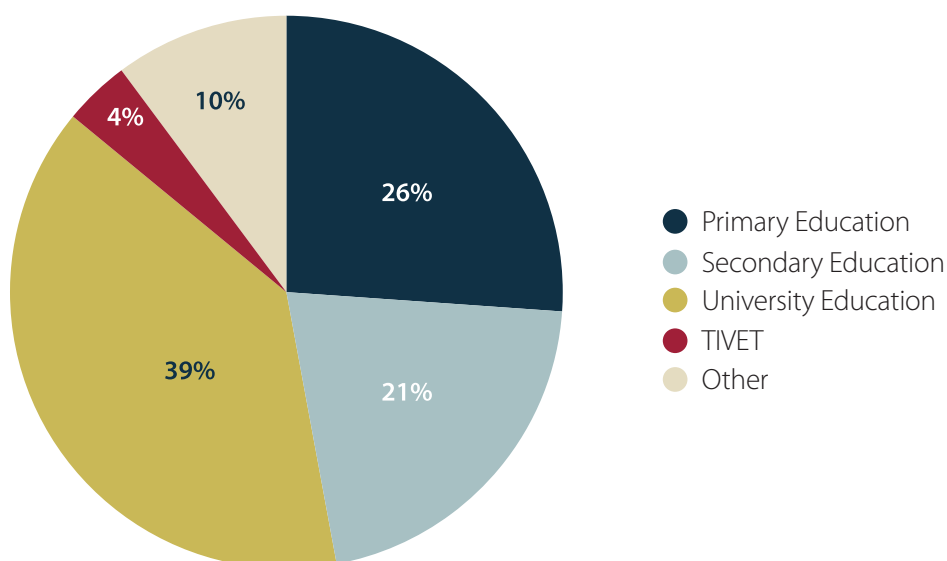
Source: Staff computation based on the National Treasury data

a In this report, due to reasons of consistency and comparability, primary education includes the first two cycles of basic education, and secondary education includes the third cycle of basic education (lower secondary education) and high school (upper secondary education). The Honduran educational system is structured according to the following levels: pre-primary education (ages 3 to 5), basic education (1st cycle, ages 6 to 8; 2nd cycle, ages 9 to 11; 3rd cycle, ages 12 to 14), high school education(ages 15 to 17) and higher education (ages 18 to 22).

⬤ **Example 12: Analysis of education spending by economic classification**

Honduras PER (2015)

Overall comment:

This example shows analyses of education expenditure by economic classification (with a particular focus on spending on wages) and provides regional and international benchmarking on the wage bill.

The wage bill, accounting for almost 90 percent of the total public spending on education, is strikingly high in Honduras when compared to similar countries. A large wage bill is partly attributed to the high average level of teachers' salaries, especially after the significant increase in the minimum wage in 2009 (by 63 percent). Figure 16 shows that Honduras spends considerably more on the wage bill than its neighboring CA countries or even other LAC countries with higher income, such as Chile or Colombia. The share of expenditures going to salaries is also much higher than countries with top-class education systems such as Finland and Korea. In 2012, only 2 percent of the total public spending on education went to construction, renovation, rehabilitation and/or non-routine maintenance of the facilities. Other recurrent expenditures accounted for the remaining 8 percent. This picture is quite similar for higher education. Between 2008 and 2011, the share of wages averaged 83 percent of total higher education expenditures. Nevertheless, universities devote a larger share of its budget to capital expenditures, averaging 7 percent for the same years.

Figure 16: Wage bill as a percentage of public education spending, circa 2013
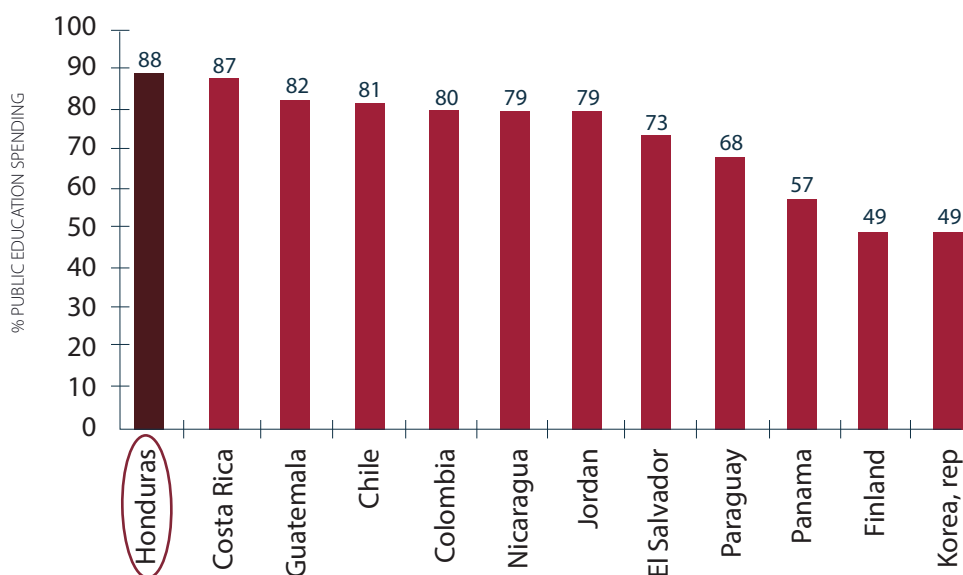
Source: SEDUC (2012). Official data for El Salvador (2011). EdStats for the rest of the countries.

⬤ Example 13: Issues related to budget formation and execution

Solomon Islands PER (2011)

Overall comment:

This example describes and analyzes issues of budget formation and execution in the Solomon Islands. It assesses accountability for the use of resources and results achieved, and recommends options for addressing the identified problems.

The PER team found three main issues related to budget formation: a) policy priorities, plans, and budgets are not well linked or integrated; b) budgetary allocations are made with little consultation with the line ministries or citizens and without a feed-back process to facilitate corrections; and c) there is a general lack of consistency over time in allocations to public services.

It is not clear how budgets support SIG policy and plans. The Ministry of Planning requests that each ministry develop a four year corporate plan. Ministries are also asked to prepare an annual or operational plan for each year of the corporate plan. These plans lay out in more detail, what will be achieved from the implementation of each activity. These plans typically include a large number of goals, often far more than could feasibly be achieved under present human and budget constraints. National plans set targets for outputs and/or outcomes but these are not generally accompanied by cost estimates. By contrast, the national budgets are organized in terms of inputs and do not include clear expectations for service delivery targets. National plans and budgets are not linked: the budget does not show clearly and consistently what activities are to be delivered and how spending contributes to government policy priorities.

Consultations with line ministries have been poor. The only portions of a ministry budget that are systematically deliberated upon are a small fraction of the recurrent budget set aside for new activities,[a] and the development budget.[b] Decisions regarding most of each ministry budget are largely incremental, meaning that the bulk of the allocation decisions are percentage increases over the previous year's baseline allocations – decisions are made with insufficient regard for what ministries should achieve or how much their goals would cost.

There are few mechanisms for consultations with citizens. Consultations with citizens and provincial governments are not used well in forming and prioritizing national plans and line ministry corporate plans. The budget process includes no formal processes for hearing citizen input and encouraging debate regarding allocations of resources. Unlike in many other poor countries, there is very limited discussion within media or civil society regarding resource allocation decisions included in the budget.

There may be a need to better align budgetary allocations with ministry requirements. There is a general lack of consistency over time in allocations to large, priority public services such as policing, health, or education.

Actual spending does not resemble approved allocations. While execution across some Ministries has been relatively close to what was approved by Parliament, there are more ministries where actual expenditure has very substantially exceeded or fallen short of budgets. This is shown in Table 3 below. In 2009 for example, 6 of 30 budget heads were spent within plus or minus 10 percent of their original approved recurrent allocations. Execution of the development budget is very weak. While SIG contributes only a fraction of the funding for the development budget, Table 3 shows that fraction has been underspent in most ministries. In 2006-09, for example, no more than two ministries spent within plus or minus 10 percent of their approved allocation from the consolidated portion of the development budget. The majority of ministry allocations were under-spent. This is partially the consequence of SIG placing a higher priority on recurrent obligations (notably the wage bill) but it may also a reflection of generally weak capacity for project implementation throughout SIG.

Table 3: Budget execution, 2006-09

	2006	2007	2008	2009
Deviation in SIG Controlled Resources (% of Budgeted Amount)	0.3	4.8	-11.9	-13.6
Recurrent Spending[a]				
Good Execution (Number of budget heads withing ±10%)	10	14	16	6
Poor Execution (Number of budget heads)	5	15	14	24
Over +10% of approved allocation	2	8	2	4
Under -10% of approved allocation	3	7	12	20
Spent without allocation	0	0	0	0
Total Budget Heads with Allocations or Expenditures	15	29	30	30
Development Spending, Consolidated				
Good Execution (Number of budget heads withing ±10%)	0	2	1	0
Poor Execution (Number of budget heads)	9	13	25	26
Over +10% of approved allocation	1	1	0	1
Under -10% of approved allocation	8	12	25	25
Spent without allocation	0	2	0	0
Total Budget Heads with Allocations or Expenditures	9	17	26	26
Development Spending, Non-appropriated[b]				
Good Execution (Number of budget heads withing ±10%)	3	10	4	5
Poor Execution (Number of budget heads)	14	13	23	20
Over +10% of approved allocation	6	6	10	3
Under -10% of approved allocation	8	7	13	17
Spent without allocation	7	2	1	2
Total Budget Heads with Allocations or Expenditures	24	25	28	27

[a] Excludes sector budget support for health and education.
[b] The outcome in 2009 reflects changes in the accounting of support for police and justice programs as well as some under-counting in other ministry programs rather than actual under-spending.

Sources: MOFT and World Bank staff calculations using most recent database from January 2011.

There has been little accountability for the use of resources and results achieved. The public has not been able to see what activities and programs the government was using money for, nor the results achieved, because of the way the budget is presented and because of delays in reporting actual outcomes. Line ministries have not been held to account by Ministers, in part because there is little information about what activities they will deliver or results they will achieve.

It is important to deal with the formation, execution, and accountability problems together because they are mutually reinforcing. The incentive to budget well increases when three conditions are met: i) line ministry officials have confidence that they will be consulted; ii) ministry officials have confidence that allocations provided will match what was agreed during consultations; and iii) the approved budget is the final word -- ministers cannot press for changes except in clear cases of emergency. Similarly, the incentive to execute each budget faithfully improves when line ministry officials believe it meets their needs and when they are held accountable for their decisions.

[a] The process also makes it is difficult to know with certainty whether bids for alleged new activities represent genuine new activities or instead represent inflated costs for ongoing activities.
[b] The public expenditure review team received mixed reports as to how much scrutiny development budget expenditures get.

⬭ Example 14: Analysis of per student spending

Armenia PER (2011)

Overall comment:

This offers a good example of examining the distribution of educational inputs (including per student spending, average class size, average school size, and student-teacher ratio) by school location and community type. The analysis points to inefficiency in the utilization of educational inputs across schools.

The main contrast in educational efficiency within Armenia is between small rural schools and large urban ones. In 2009/10, rural schools had an average of 174 students, with an average class of 13.6 and a student-teacher ratio of 8.0. In contrast, urban schools educated an average of 450 students, grouping them 21.8 per class and 11.4 per teacher. Rural schools have been able to flourish with smaller classes because they have ample funding (rural schools receive 53 percent more per student than urban ones) and do not run into infrastructure constraints (nationwide, rural schools utilize less than half of their building capacity). Similar trends are evident when comparing schools in mountainous/highly mountainous locations to non-mountainous ones, as well as the only schools in small communities versus all other ones (Figure 4.5).

The pattern of potential inefficiency is even more evident when viewed through the lens of school size. Nearly two-thirds of Armenia's schools have 300 or fewer students. These institutions receive 42 percent of all PCF funding and employ 43 percent of staff in general secondary education. Yet the utilization of educational inputs in these schools is strikingly inefficient. For example, among the 369 schools with 100 or fewer students (27 percent of all schools in Armenia), the average class size is 5.6 with 3.7 students per teacher. These schools utilize only 27 percent of their available building capacity, compared to 56 percent nationwide.

Figure 4.5: Distribution of educational inputs by community type, 2009/10

- - - - - - Republic of Armenia

(a) Average PCF Allocation per Student (000s AMD)

(b) Average School Size (Number of Students)

(c) Average Class Size

(d) Student-Teacher Ratio

(e) Non-Teaching Staff as % of All School Staff

(f) School Capacity Utilization (Student Enrollment as % of Total Builing Capacity)
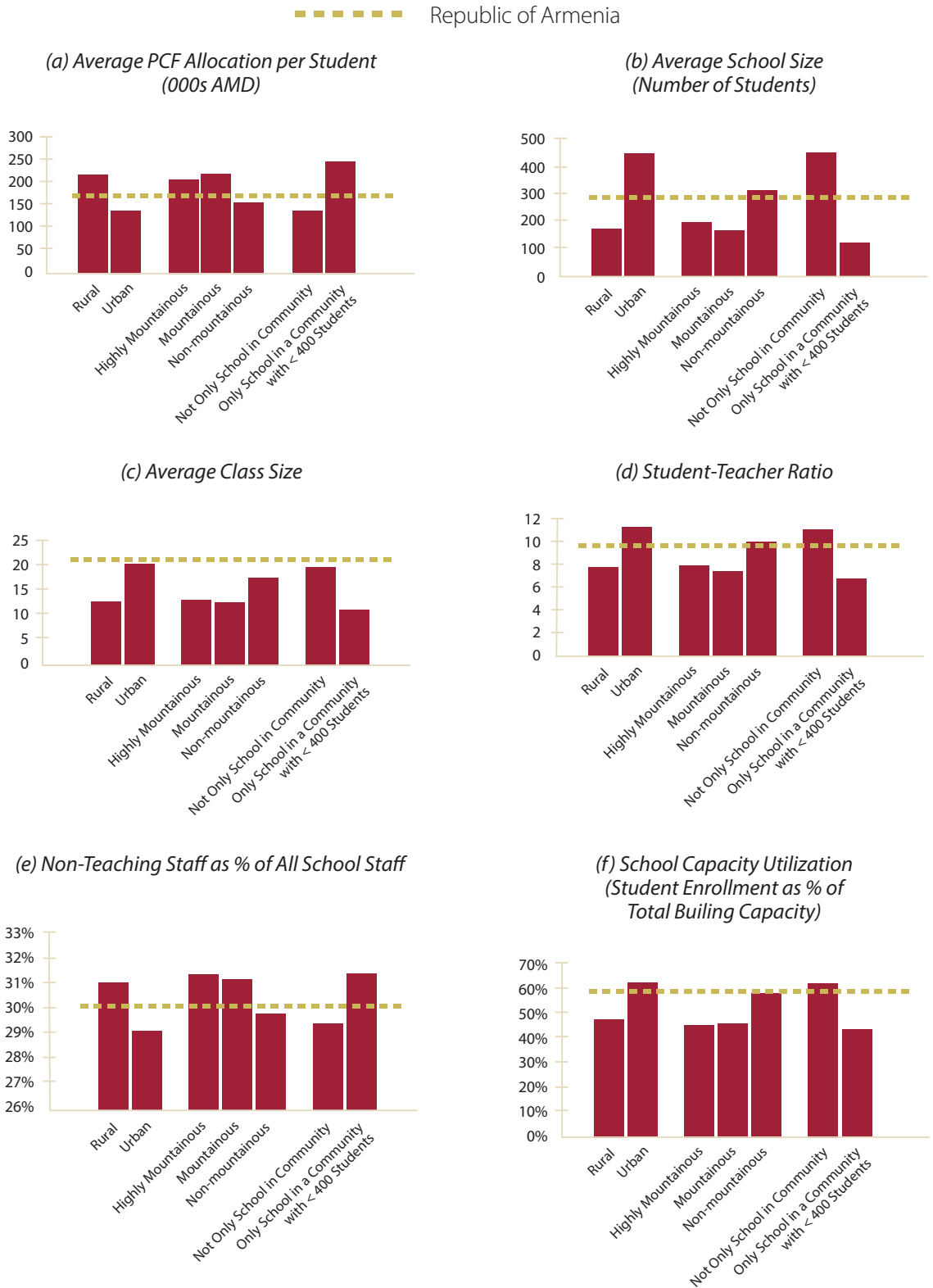
Source: World Bank calculations based on data from the National Statistics Service (NSS), the National Center for Education Technology (NaCET), the Assessment and Testing Center (ATC) and MOF.

⬤ Example 15: Minimum norms and standards for resource allocation

Overall comment:

The Belarus and Bosnia public expenditure reviews provide examples of education sector spending norms and standards for resource allocations. In Belarus, these include minimum, per student allocation by level of education, facility conditions, and equipment, etc. The Bosnia example provides specific norms and standards related to staffing.

Belarus (2013)

In Belarus, several sectoral spending norms and standards govern resource allocation. In particular, services of education institutions should meet approved social standards (Box 4).

In addition, the MOE issues certain standards and spending norms. While some of these norms are linked to the number of students, some are related to inputs. For example, in schools with indoor swimming pools, an additional janitor (0.5 of full-time equivalent) is introduced for each 250 square meters of the area of swimming pool subject to cleaning, irrespective of the number of students in the school. These norms further constrain discretion in spending decision at the facility level, while not necessarily leading to better learning outcomes, as shown in the subsequent sections of the PER.

Box 4. Social Standards in Education

In 2003 the Government adopted social standards for services, including in the education sector. These define the minimal requirements that should be met by educational institutions. Compliance remains an issue in some areas. For example, the number of seats in the pre-school institutions in Minsk rayon of Minsk oblast is still below the standard.

Resolution of the Council of Ministers 724 of May 30, 2003, and revision 47 of January 13, 2013 specify the following standards in education:

- Number of seats in pre-school institutions to the number of children of pre-school age (85 percent)
- Net enrollment rate of 5 year-old children in pre-school education (100 percent)
- Minimum per student allocation in pre-school education (2,050,000 BYR per year)
- Minimum per student allocation in general secondary education of all types (1,370,000 BYR per year)

- Minimum per student allocation in special education institutions for children with disabilities (5.5 million BYR per year)
- Minimum per student allocation in vocational schools (3.5 million BYR per year)
- Minimum per student allocation in out-of-school training institutions (200,000 BYR per year)
- Minimum area of general educational institution per student (8 sq. m)
- Areas equipped with facilities for sports (1.62 sq. m per student)
- Premises for sports activities (0.5 sq. m per student)
- Minimum number of personal computers in general secondary, special and vocational schools (one computer per 30 students or at least one computer lab per school)

Bosnia (2012)

The Republika Srpska (RS) and each canton in Federation of Bosnia and Herzegovina (FBH) set standards and norms on staffing, defining the minimum, optimal, and maximum class sizes, the number of teaching hours, the number of support staff primarily based on the number of students, recurrent expenses by different teaching system.

Table 6.9 shows the staffing standards and norms, which in turn define school budgets in RS. If these norms are strictly applied, for instance, schools with 60 students are expected to form only two classes with 30 students each, instead of three classes with 20 students each. However, the guidelines also note that in exceptional cases, the Ministry can permit a class with less than 18 pupils, if it is the only class in one grade and a combined class has more than the norms. Without detailed analysis of school-level data, it is difficult to form a clear picture as to how these norms are applied in practice, but given that the average school size for RS is very small at 144 (or 16 students per grade on average) (see Table 6.9 below), it is likely that many schools are given an exceptional status.

Table 6.9: Factors determining school budget for primary schools

1	No. of classes			2. No. of puplis
2	No. of pupils [1/]		1. No. of classes	
	a	No. of pupils in classes	1	18-32
			2	33-60
			3	61-90
			4	90-120
			5	121-150
			6	151-180
			7	181-210
			8	211-240
			9	241-279
	b	No. of pupils in combined classes	1	merging two grades up to 18
			2	merging three grades up to 12
	c	No. of pupils in special education classes	1	up to 10

3	No. of lessons in a class in accordance with the curriculum	No. of teachers = Class hours (curriculum) / Teacher's weekly work hours (40 hours)	
4	No. of lessons planned per class		
5	No. of working hours of non-teaching staff in line with the	Coefficients	
	Pedagogue	1 for school with 16 or more classes	
		0.05 per class < 0.5 for school with 16 or less classes	
	Psychologist	1 for school with 24 or more classes	
		May be combined with special education teacher / logo-pedist, or social worker	
		0.05 per class <0.5 for school with 24 or less classes	
	Assistant principal	0.025 per class exceeding 24 classes or 8 or more branch classes	
		0.5 for school with 2 or more nine-grade branch classes	
	Librarian	1 for school with 16-32 classes and 5,000 units of literary and non-literary	
		0.05 per class <0.5 for school with 16 or less classes	
	Assistant librarian	0.05 per class exceeding 32 classes and 10,000 units of literary and non-literary	
	Secretary	1 for school with 16 or more classes	
		0.05 per class <0.5 for school with 16 or less classes	
	Accountant	1 for school with 16 or more classes	
		0.05 per class <0.5 for school with 16 or less classes	
	Administrative-finance worker	1 for school with 24 or more classes	
		0.05 per class exceeding 24 classes	
	Janitor	1 for school with 16 or more classes and an ara between 2,000-5,000m2	
		0.05 per 100m2 or per each class below 16<0.5 or less than 2,000m2	
		0.05 per 100m2 or per each class exceeding 32<1 or more than 5,000m2	
	Night watchman	1 per school facility	
	Heating maintenance mechanic	1 for school with central heating for up to 2,000m2	
		2 for school with central heating for more than 4,000m2	
	Transportation	1 for school with no organized transportation	
	Hygiene	0.25 per class	
	Maintenance	1 per school facility	
6	Years of past work experience of employees		
7	Salary coefficients		
8	Labor cost		
9	Increase according to working conditions		

Source: Ministry of Education and Culture of the Republika Srpska, Rules on Primary School Funding.
Notes: 1/ In exceptional cases, the Ministry can permit a class with less than 18 pupils if it is the only class in one grade and a combined class has more than the norms.
2/ Schools in mountainous areas and extremely undeveloped municipalities may form smaller class sizes if formed in the "most cost-effective manner".

Table 6.10 summarizes the minimum, optimum, and maximum class sizes and teaching loads by subject in six cantons in FBH. There are three important issues to be addressed. First, it is interesting that all cantons (where data are available) specify the optimum class size, in addition to the minimum and maximum sizes. This custom seems to discourage schools from forming classes beyond the optimum size even if they are below the maximum size. Since there is no clear evidence to suggest that these optimum sizes result in better education than anywhere between the optimum and maximum sizes, by removing the optimum sizes, schools may form slightly larger classes efficiently without harming quality. Second, there is no clear rationale for the wide variations in the minimum class size from 16 (Bosnian Podrinje Canton) to 22 (Tuzla Canton). Cantons which set the minimum class size lower than others could increase it, unless there is clear justification such as geographical constraints. Third, teaching loads are almost the same for all cantons except for Tuzla Canton. By increasing the teaching hours by one or two hours, other cantons would be able to reduce the number of teachers, and therefore the wage bills for teachers, by 5-10 percent. In order to analyze the correlations between costs and quality, more detailed school-level data such as per student spending, wage bills, and student performance are needed.

Table 6.10: Standards for class sizes and teaching loads by canton, 2011

| | Class size (regular with no combined classes) | | | Teaching loads (hours), excl. preparation, correction, evaluation hours | | | |
	Min.	Optimum	Max.	National languages	Foreign languages, math, chemistry	Biology, informatics	History, geography, music, etc.
Una-Sana	18	27	35	18	19	20	21
Posavina	17	25	33	18	19	19	20
Tuzla	22	28	34	20	20	21	22
Zenica-Doboj	18	26	36	18	19	20	21
Bosnian Podrinje	16	24	32	-	-	-	-
Central Bosnia	-	-	-	-	-	-	-
Herz.-Neretva	-	-	-	-	-	-	-
West Herz.	-	-	-	-	-	-	-
Sarajevo	18	24	32	18	19	20	21
Canton 10	-	-	-	-	-	-	-

Source: Ministry of Education of the respective cantons.
Notes: - indicates that data are not available.

⬤ Example 16: Analysis of cost of teachers

Overall comment:

The Kosovo example provides analyses and policy recommendations related to the government reform on differentiated teacher pay scales, which aimed to improve teacher quality in Kosovo. The Jordan case presents a comprehensive analysis of teacher compensation system and provides good examples of different ways to assess whether teacher pay is adequate.

Kosovo PER (2014)

In Kosovo, spending on wages under the education budget increased by over 25 percent in real terms between 2009 and 2012, taking wages from 85 percent of total spending on basic education (grades 0-9) in 2009 to 92 percent by 2012. Spending on non-salary recurrent items was low in 2012 compared to OECD or regional countries. On average, OECD countries spent 22 percent of education budget on non-salary recurrent items, and about 8.7 percent on capital expenditures.[a] In Europe, Slovenia spent 19 percent of total expenditures on non-salary items and 8 percent on capital expenses, while Bulgaria and Romania spent 26 percent on non-salary items, and 6 and 4 percent on capital expenditures respectively.[b] In Kosovo, increases granted to the education sector have been devoted almost entirely to salary increases, and for the most part have not been directed to other quality enhancement investments.

Figure 5.11: Education expenditures by economic category, % GDP
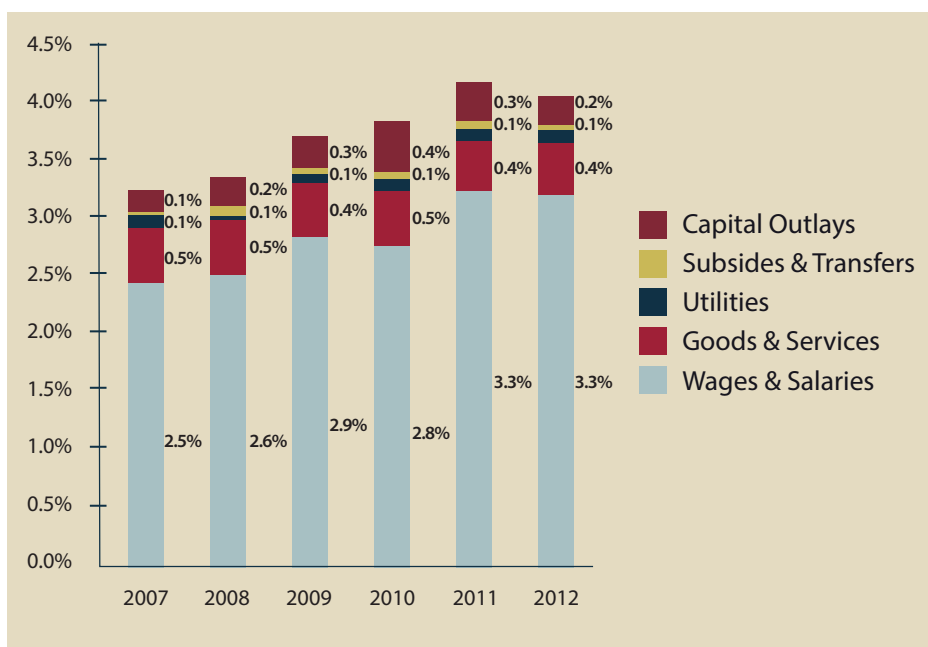
Source: Kosovo BOOST.

Recent changes to the teacher salary structure aimed to improve teacher quality. In October 2008, the pre-university "teachers' differentiated salary system" came into effect. This was part of a comprehensive teacher licensing and professional development effort intended to improve the teaching system's ability to attract and retain qualified staff. Prior to the reform, teacher salaries were uniform, differentiated only by the grade taught (i.e., with different salaries for teachers at pre-primary, primary and secondary grades). Under the reform, differentiated pay scales were introduced based on qualifications, grade level and experience. As a result, all teaching staff, other than those who were unqualified and those with less than one year of experience, received a pay increase.[c]

The reform of teachers' career development and remuneration was a welcome development; however, the politically-motivated increases that followed in 2011 distorted the reform. In keeping with electoral promises, the government increased the "base salaries"[d] of all teachers by 50 percent in 2011. While the differentiated salary structure was kept, the decision was not aligned with the reform principles of future salary increases being linked with performance and professional development. Moreover, increases were granted to unqualified or beginner teachers, which was not the case with the 2008 increases. As a result, the difference in base salary for an unqualified/beginner teacher and a teacher with bachelor's degree[e] was reduced to 18 percent compared with 27 percent in 2008.

Table A.19. Teacher salary structure teachers KS (euro, monthly)

	Base salary (in 2007)			Base salary based on qualifications (in 2008)			% Increase based on qualifications (in 2008)	Current base salary with 50% increase based on qualifications (in 2011)			Actual % Increase based on qualifications (in 2011)
	Pre-primary	Primary	Secondary	Pre-primary	Primary	Secondary		Pre-primary	Primary	Secondary	
Unqualified/ Beginner[235]	201	216	236	201	216	236	0%	302*	324	352	0%
5-year secondary teacher school	201	216	236	221	238	260	10%	322**	346	377	7%
2-year Higher Pedagogical School	201	216	236	239	257	281	19%	340	365	398	13%
BA (3-year & 4-year) degrees	201	216	236	255	274	300	27%	356	382	417	18%
Masters and Ph D degrees	201	216	236	271	292	319	35%	372	400	436	23%

Source: Ministry of Public Administration, Teachers' Payroll Data July 2013; *Payroll data suggest that unqualified/beginner teachers' salaries were also raised by 50 percent; ** The 50 percent increase and the percentage increase for each qualification were applied to 2007 base salary.

In the short run though, it appears that teachers were incentivized to upgrade their qualifications, albeit through a government subsidized program. When comparing the composition of the teaching force by qualifications in 2008 with data available in 2013, it appears that teachers have invested in upgrading their pre-service qualifications (Figure 5.12). Over this time, there was a large reduction in teachers with Higher Pedagogical School (HPS) education and a corresponding increase in those with a Bachelor degree. This shift can be attributed to the initiative to fund the upgrade of pre-service qualifications of all teachers with HPS to a Bachelor degree by the end of 2015.

Figure 5.12: Distribution of teachers by pre-service qualifications, 2008 and 2013
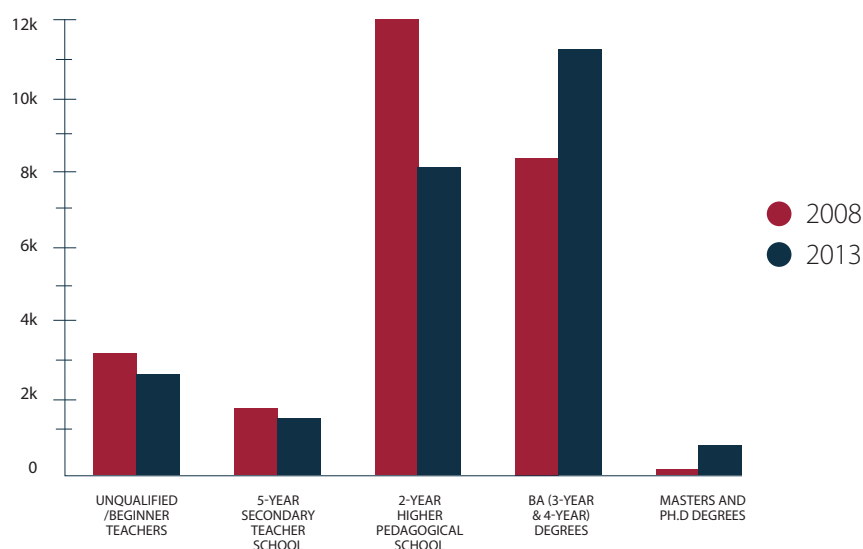
Source: Kosovo EMIS

Following the reform process and the 2011 increases, teachers' salaries became comparable with other sectors. The average teacher's net salary was €347 per month.[f] This was only about 5.7 percent below the average net salary in the public sector, and about 3 percent below the average salary in health sector.[g]

The best use for any additional funds for teacher salaries would be to provide incentives for improved performance and professional development rather than politically motivated increases.[h] The National Teacher Licensing Council has developed a professional development and performance evaluation mechanism that will provide teachers with an opportunity to strengthen their qualifications and move up the career ladder. The system, which is already in place, grants a temporary license and a regular license to teachers. Those on temporary licenses (about 14 percent of the current teaching force that are beginner or unqualified) will need to meet qualification and training criteria to receive a regular license or risk losing the right to teach.[i] At the same time, teachers on a regular license can be promoted through five career grades. Teachers need to take training and receive at least one positive performance evaluation in a period of five years to move from one grade to another.[j] Additionally, the teacher career reform has made it mandatory for teachers to attend at least 70 percent of "core trainings". Linking future salary increases to training and education of the teaching force would reinforce these reforms designed to enhance quality. Granting politically-motivated across-the-board increases, on the other hand, would risk undermining them.

[a] OECD, Education at a Glance 2012, Table B6.2.
[b] World Bank EdStats.
[c] The base salary increased by 10 percent to 35 percent depending on qualifications: teachers with (i) 5-year secondary teacher school received a 10 increase; (ii) 2-year Higher Pedagogical School received 19 percent; (iii) Bachelor degree holders received 27 percent; and (iv) Master's or Ph.D. degree holders received 35 percent. Additionally, for each year of working experience teachers received 0.003 percent of their base salary.
[d] "Base salaries" are the salaries that teachers received in 2007, before any adjustments for inflation or other increases followed. Salary adjustments are not always made with relation to teachers' current salaries but to their base salary.
[e] As per the Law on Pre-University Education (2011), all new teachers must now complete at minimum a Bachelor's Degree to be able to join the teaching force.
[f] This was in 2013 before the wage increase of 25 percent granted in April 2014.
[g] Kosovo Agency of Statistics, General Statistics, Quarterly Bulletin, Average Monthly Paid Net Wages in the Budget sector by year, April 2013.
[h] In fall 2013, the government had promised another wage increase by 50 percent. In March 2014 GoK decided to increase wages by 25 percent applicable from April 1st 2014, and the decision has had a negative impact in implementation of reform for career development of teachers. Furthermore, because the wage increase was done in a similar way as in 2011, the wage structure has pressed further the difference by qualifications pre-service.
[i] In March 2014, GoK decided to increase wages of all civil and public servants by 25 percent, applicable from April 1st 2014. As noted earlier, due to time and data constrains, further analysis on the implications of these increases could not be included in this report.
[j] According to Administrative Instruction No. 5/2010, a teacher career license is valid for 5 years. To extend the license, teachers need, at minimum, to have a satisfactory performance evaluation and to have completed at least 100 training hours, of which 70 percent in core in-service training programs and 30 percent in optional courses, in optional courses, over five years. The criteria for advancement to a higher license require at least 300 hours of teacher training over five years.

Jordan PER (2016)[a]

Compensation captures a high share of recurrent spending in the education sector in Jordan, leaving few resources for non-wage inputs. The teacher pay scale and allowances in Jordan reward initial qualifications, seniority, and personal teacher attributes, as opposed to being an instrument for policy makers to incentivize better teaching performance or other desired education sector outcomes. Teachers in Jordan are relatively well-paid, based on comparisons with other tertiary-educated workers in the economy, relative to per capita GDP, and taking teaching time into account.

A closer look at recurrent spending under the Ministry of Education (see Table 19) shows that fully 92.3 percent of total recurrent spending was dedicated to worker compensation in 2013, with nonwage recurrent spending amounting to 7.7 percent. The non-wage recurrent spending includes spending on rent, utilities, maintenance, and cleaning – i.e. basic operations of educational institutions – as well as direct teaching inputs such as stationery, learning materials, and textbooks. By contrast, the 2011 OECD average share of compensation in total recurrent spending was 78.9 percent, leaving 21.1 percent for non-wage inputs.[b]

Table 19: Ministry of education recurrent spending, by program (2013)

	Adminis-tration and support services	Vocational Education	Educa-tional, social & physical activities	Special educa-tion	Early childhood education	Basic education	Secondary education	Eradicating illiteracy	Sub-total
Worker compensation	4.5	2.8	0.0	0.3	0.3	76.4	7.9	0.0	92.3
Salaries, wages, allowances	4.3	2.6	0.0	0.3	0.3	71.4	6.7	0.0	85.6
Social security contributions	0.2	0.2		0.0	0.0	5.0	1.2		6.6
Goods and Services	0.6	0.1	0.1	0.1	0.0	1.8	3.2	0.0	5.8
Assistance			0.0						0.0
Assistance/stipends	0.0								0.0
Other	1.6			0.0		0.3	0.0		1.9
Sub-total	6.7	2.9	0.1	0.4	0.3	78.4	11.1	0.1	100.0

Source: Ministry of Finance. June 2014. *General Budget Final Accounts of Fiscal Year 2013*, pages 158-174

Looking at the breakdown of worker compensations (see Table 20), overall – across all levels of education – additional allowances constitute the largest share at 36.6 percent, followed by wages of non-classified employees (26.8 percent), and the cost of living personal allowance (24.1 percent). However, since employees' wages appear divided into three categories – classified, non-classified, and contract employees – arguably they should count together and so constitute 36.2 percent of total compensation. The additional allowance reflects the decision to double the base salary of all education sector employees, beginning in 2013. In effect, since it is an automatic doubling, it is no longer an allowance but constitutes part of the base salary. The largest allowance is therefore the cost of living personal allowance.

The cost of living allowance is an allowance allocated to all staff without preconditions. Other allowances depend on the particular circumstances of the individual, e.g. whether they are married or single; teaching in a remote area; or had to relocate from their home district to another district, governorate, or even region of Jordan. This approach to allowances blunts their usefulness in terms of achieving certain desired results, such as location of teachers in certain areas, or teaching of certain subjects, or motivating certain behaviors of teachers.

Table 20: Ministry of education worker compensation, by program (2013)

	Administration and support services	Vocational Education	Educational, social & physical activities	Special education	Early childhood education	Basic education	Secondary education	Eradicating illiteracy	Total
Worker compensation Salaries, wages, allowances									
Classified employees	17.4	12.7			6.8	8.4	13.8		9.3
Non-classified employees	16.0	23.8		35.0	29.6	27.7	25.1		26.8
Contract employees	1.2								0.1
Cost of living personal allowance	18.0	22.1		25.5	27.1	24.7	22.3		24.1
Cost of family allowance	2.1	1.7		0.7	0.1	1.3	1.5		1.4
Additional work allowance	0.7	0.8	55.0			1.0	3.7		1.2
Additional allowance	36.4	38.9		37.2	36.4	36.8	33.6		36.6
Other allowances	1.5								0.1
Transportation allowance	4.2								0.2
Transfer compensation	1.0								0.1
Field allowance	0.6								0.0
Employee bonus	0.9	0.0	45.0	1.6		0.0		100.00	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Ministry of Finance. June 2014. *General Budget Final Accounts of Fiscal Year 2013*, pages 158-174

Public education employees fall into three categories, depending on whether they hold a BA (Category 1), a diploma (Category 2), or are technical support staff, e.g. drivers (Category 3). Focusing on Categories 1 and 2, under which teachers would fall, the salary progression takes place both in terms of steps within the same category (seven steps in Category 1 and nine steps in Category 2) as well as by years of service (up to a maximum of fifteen years at the highest step in each of the categories). As a result, the lowest base monthly pay for an entry level Category 1 employee (Step 7) is 150 JD, while the highest pay for a Category 1 employee (Special) with 15 years of service is 593 JD, meaning almost four times as much pay. Similarly, an entry level Category 2 employee (Step 9) earns 125 JD per month, compared to a Category 2 Step 1 employee with 15 years of service who earns 353 JD, i.e. almost three times as much (see Table 22).

In many countries, and in most OECD countries, teachers' salaries increase with the level of education taught.[c] This is not the case in Jordan. Instead, the initial qualification (BA or diploma) determines the starting salary.

Table 22: Education sector staff basic salary scale, 2012 (JD/month)

Category	Level	Grade	Years at grade level														
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
One	First	Special	425	437	449	461	473	485	497	509	521	533	545	557	569	581	593
		1	302	312	322	332	342	352	362	372	382	392					
		2	260	268	276	284	292										
	Second	3	228	234	240	246	252										
		4	202	207	212	217	222										
		5	181	185	189	193	197										
	Third	6	165	168	171	174	177										
		7	150	153	156	159	162										
Two	First	1	269	275	281	287	293	299	305	311	317	323	329	335	341	347	353
		2	243	248	253	258	263										
		3	218	223	228	233	238										
	Second	4	197	201	205	209	213										
		5	177	181	185	189	193										
		6	161	164	167	170	173										
	Third	7	146	149	152	155	158										
		8	135	137	139	141	143										
		9	125	127	129	131	133										
Three			120	123	126	129	132	135	138	141	144	147	150	153	156	159	162

Source: MOE Human Resources Department

In all school systems, teachers' salaries rise during the course of a career, although the rate of change differs greatly. Since Jordan participated in the 2012 PISA, it is possible to compare its salary scale with other participating countries. Thus, Jordan is among the countries where salaries at the top of the scale are considerably higher than starting salaries – on average for this group, which includes Korea, Shanghai-China, Malaysia, Singapore, Romania, and Jordan, salaries at the top of the scale are 2.5 times higher than starting salaries and it takes between 20 and 40 years to reach the top salary.[d] By contrast, in Denmark, Iceland, Norway, Slovenia, Sweden, Finland, Germany, the Slovak Republic, the Czech Republic, Spain, Peru, Montenegro, and Croatia, teachers' salaries at the top of the scale are at most 1.4 times higher than starting salaries. Jordan's approach to teacher compensation therefore encourages longevity in the sector, since rewards with seniority are substantial.

Additional payments based on teachers' qualifications, training, and performance are also common in OECD countries. In other words, while Jordan uses teachers' qualifications to distinguish between the base salary for those with a diploma versus a BA, OECD countries tend to use an allowance to reward an initial education qualification that is higher than the minimum requirement. In this manner, the initial qualification is rewarded but its importance in teacher total pay recedes with time as the growth potential for all teachers is the same. Moreover, among the OECD countries, 21 countries offer an additional payment to teachers for outstanding performance, and in 17 of those countries, the decision to award the additional payments is made by the school principal (OECD 2014).

One comparison that is often employed to assess relative attractiveness of teacher pay is between teacher salaries and the earnings of tertiary-educated workers in the economy. Ideally, teachers' salaries here either refers to actual salary, including bonuses and allowances, for teachers aged 25-64 or to statutory salary after 15 years of experience and minimum training. The comparison is made then relative to full-time, full-year workers with tertiary education.

For the OECD countries, teachers in pre-primary, primary, lower secondary, and upper secondary education earned on average 0.80, 0.85, 0.88, and 0.92 times the amount earned by full-time, full-year workers with tertiary education. The country with the highest relative teacher pay was Korea, where pre-primary teachers earned 1.32 times the earning of other tertiary-educated workers in the economy, and all other teachers earned 1.36 times as much.

In the case of Jordan, using data from the Jordan Employment and Unemployment Survey and Household Income and Expenditure Survey, Assaad et al. (2014) provide first-job wages for individuals between the ages of 25 and 40 in 2012 who graduated in either commerce/business or information technology (IT) from a four-year higher education institution and live in urban areas. The average monthly wage is found to be JD 342, rising to JD 561 five years later (where the individual did not go on to further higher education). This translates to JD 4,104 in 2012 JDs, or JD 4,334 in 2013.[e] By comparison, a starting teacher with BA earned 5,460 JD, or 1.26 times the earnings of a commerce or IT graduate working in the private sector. While the comparison is not completely parallel with the OECD comparison described above, it does provide an indication that teachers are relatively well-paid in Jordan.

Another method used often to assess whether teacher pay is adequate or not is to compare teacher pay to a country's per capita GDP. Thus, per capita GDP in Jordan in 2013 was 3,653 JD, while the minimum starting salary for a teacher was 4,860 JD, i.e. 1.3 times the per capita GDP. However, this comparison is more typically done not for starting teachers but for teachers with 15 years of experience and minimum training – separately for lower secondary and upper secondary education.

Using the 2012 PISA findings, the OECD average for lower and upper secondary is 1.24 and 1.29, respectively. For Jordan, the ratio is the same for both levels of education and stands at 2.15 – the highest ratio amongst all countries participating in PISA in 2012 (see Figure 16). In other words, a teacher with 15 years of experience in Jordan is earning more than twice the per capita GDP according to PISA data.

Figure 16: Teacher salaries relative to per capita GDP, 2012

Expenditure on education and teachers' salaries
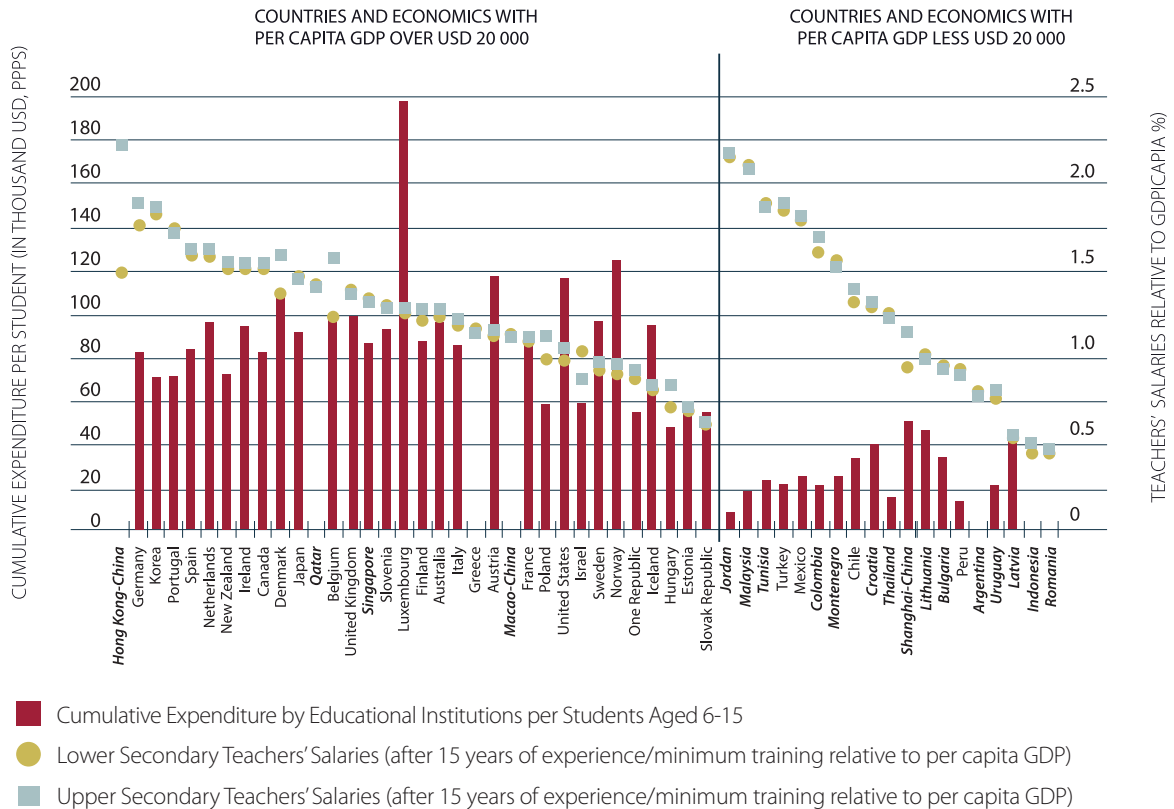
Source: OECD 2014. *PISA 2012 Results: What Makes Schools Successful? Resources, Policies and Practices* (Volume IV), page 96.

The above analysis of teacher salaries has focused on statutory pay using available data on the pay scale. However, actual average teacher pay in Jordan may well be quite different, as the average teacher may not have 15 years of experience and possess minimum qualifications. Table 25 provides data on total salaries and allowances at the governorate level. The wage data are not available by type of education sector employee, i.e. whether they are teachers, principals, supervisors, etc. If there are significant differences across governorates in the breakdown across the different types of education sector employees, then taking a simple average will make the comparison across governorates very tenuous. Therefore, 6,800 JD probably represents a good estimate of the average pay for education sector staff in Jordan in 2015 – although not for teachers specifically. Therefore, given that Jordan's per capita GDP was 3,811 JD in 2014, average education sector pay equals 1.78 of per capita GDP, i.e. relatively high, but not as high as the ratio reported in comparison to other PISA countries. This, in turn, indicates that the average education sector staff in Jordan has fewer than 15 years of experience on the job.

Table 25: Average education sector staff pay, by governorate (2015)

Governate	Total governate wages and allowances	Total Staff	Average Wage
Amman (incl. MOE)	162,220,932	23,774	6,823
Balqa	43,917,540	6,453	6,806
Zarqa	69,781,632	10,359	6,736
Madaba	21,924,624	3,239	6,769
Irbid	127,378,668	18,241	6,983
Mafraq	58,181,928	8,873	6,557
Jarash	25,154,568	3,672	6,850
Ajloun	20,585,724	3,017	6,823
Karak	47,644,260	6,999	6,807
Tafilah	19,880,508	2,966	6,703
Maan	24,860,952	3,812	6,522
Aqaba	13,679,316	2,066	6,621
Total	635,210,652	93,471	6,796

Source: MOE Human Resources Department

Yet another angle to assessing teacher pay in Jordan is the following: in addition to class size, student-teacher ratio, and teachers' salaries, the number of hours of student instruction and the amount of time teachers spend teaching also affect the financial resources countries need to allocate to education. In Jordan, students spend on average 6 hours per day, 5 days a week in school – adding up to 30 hours of instruction per week. For teachers, the average workload is 24 lessons a week, although there is some variation: for basic education, teachers' workload is 24-26 lessons a week, each lesson 45 minutes long; and for secondary, the weekly workload is 18-20 lessons, each 55 minutes long. The relationship between class size, student-teacher ratio, student instruction time, and teaching time can be described as:

Class size = student-teacher ratio x student instruction time / teaching time per teacher

Using available data on average class size and student-teacher ratio, this relationship holds for Jordan using the average student instruction time of 30 hours per week and teaching time per teacher of 18 hours per week (24 lessons each 45 minutes long).

Given that the school year in Jordan consists of 195 days (slightly above the OECD average of 180-183 depending on the level of education), the annual teaching workload is provided in Table 27 for basic and secondary levels of education, using the different weekly teaching workloads (and keeping in mind that lessons in basic education are 45 minutes long, whereas they are 55 minutes long in secondary education). As Table 27 shows, annual teaching hours are roughly comparable with averages observed in OECD countries[f]. In other words, teachers in Jordan are not teaching above average annual hours so that above average pay is warranted.

In most countries, teachers are formally required to work a specified number of hours per week, including teaching and non-teaching time, to earn their full-time salary. Some countries also regulate the time that a teacher has to be present in the school. In fact, more than half of OECD countries specify the time during which teachers are required to be available at school, for both teaching and nonteaching activities, at one or various levels of education. Although teaching time is a substantial component of teachers' workloads, assessing students, preparing lessons, correcting students' work, in-service training and staff meetings should also be taken into account when analyzing the demands placed on teachers in different countries. The amount of time available for these non-teaching activities varies across countries, and a large proportion of statutory working time spent teaching may indicate that less time is devoted to activities such as assessing students and preparing lessons.

Table 27: Teaching hours per year

Level of education	Jordan teaching workload		OECD average
	Weekly	Annual	Annual
Basic	26	761	782 (primary)
	24	702	694 (lower secondary)
Secondary	20	715	655 (upper secondary)
	18	644	655 (upper secondary)

Source: World Bank SABER 2010; Ministry of Education; OECD 2014 page 474

The Ministry of Education determines teachers' working time, stipulating that teachers spend the school day on the school premises. Since the school year consists of 195 days with 6 hours of school per day, this amounts to 1,170 hours of teacher working time annually. While such a definition is more favorable than limiting working time only to hours spent directly in the classroom, it does not go far enough in recognizing that lesson planning and grading may take place outside of official school hours. Nonetheless, the resulting teacher working time required at school in Jordan is almost identical to the OECD average for lower secondary (1,173 hours), below the OECD average for primary (1,200 hours) and above the OECD average for upper secondary (1,142 hours). Therefore again, teachers in Jordan are working average numbers of hours annually and receiving relatively high pay.

[a] The external link to the document is expected to become available in June 2017.
[b] OECD, 2014, Education at a Glance 2014, Indicator B6, Table B6.2. "Expenditure by Educational Institutions, by Resource Category and Level of Education (2011)".
[c] OECD, 2014. Education at a Glance 2014, page 456.
[d] OECD, 2013. PISA 2012 Results: What Makes Schools Successful? Resources, Policies and Practices (Volume IV), Programme for International Student Assessment, OECD Publishing, page 95.
[e] The 2013 inflation rate of 5.6 percent is based on Department of Statistics data, accessed at http://www.dos.gov.jo/dos_home_a/jorfig/2013/1.pdf.
[f] OECD, 2014, Education at a Glance 2014, page 474.

⬤ Example 17: Analysis of teacher distribution

Indonesia PER (2013)

Overall comment:

The Indonesia public expenditure review displays the magnitude of the misallocation of teachers; estimates the size of the gains that might be realized by a rationalized distribution; and provides policy options to address these issues. It demonstrates how improving the distribution of teachers can have important effects on efficiency, equity, and quality of education.

Despite the low average STR at the national level, there are vast differences in the availability and qualification of teachers across schools. Student-teacher ratios are very unequal, as are the levels of teacher qualifications. For example, in 2010, student-teacher ratios in primary schools ranged from fewer than 10 to greater than 60 students per teacher. Equally important are the differences in qualification. Wealthier urban areas have a higher concentration of more qualified and experienced teachers. The regional differences in the distribution of teachers by education level are very sharp: richer districts, especially those in Java and Bali, have access to more educated teachers. The share of teachers with a senior secondary or below education is under 20 percent in all districts in Java, whereas in some districts in Papua or Sulawesi, it reaches 60 percent.

Figure 66: Share of teachers with senior secondary or less as their highest education by province, 2010
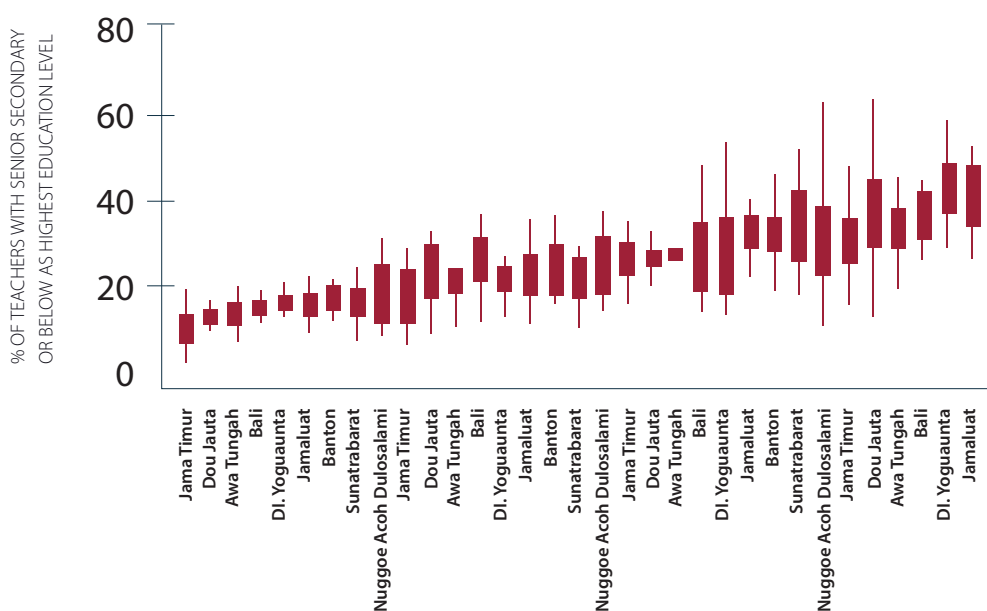
Source: Own calculations using NUPTK Data, 2010

Improving the distribution of teachers is a matter of efficiency, equity and quality of education. Making the distribution of teachers more equitable by ensuring that poor and remote schools have an equal share of qualified and experienced teachers might raise overall levels of learning and narrow learning disparities. The student-teacher ratio is the main factor when it comes to district spending on education. Districts with low STRs spend significantly more per student than districts with higher STRs. At the school level the relationship is even stronger. As implied by the trend in Figure 67, an increase in the student-teacher ratio of 5 students per teacher reduces spending per student by about one-third.

Figure 67: Per student spending and student-teacher ratios at the school level, 2010
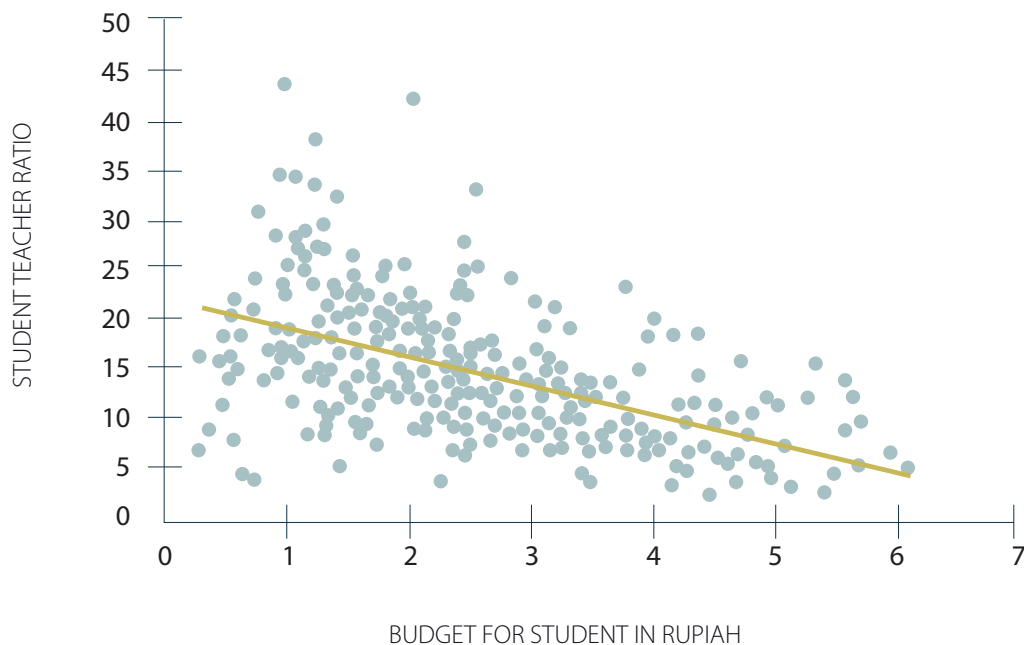
Source: Own calculations using School Based Management

The potential for efficiency savings is large. The exact amount of potential efficiency savings from raising student-teacher ratios is hard to calculate. However, using information on the current levels of students and teachers and average teacher salaries, it is possible to estimate the teacher salary bill for different levels of the student-teacher ratio. Holding the number of students and the average teacher salary constant, Figure 68 shows the effect on the total salary bill of raising the student-teacher ratio. Raising the student-teacher ratio to 23, for instance, a level that existed in the early 2000s, would reduce the overall teacher salary bill by IDR 15 trillion or 22 percent. Raising the student-teacher ratio to 28 students, a level similar to other lower-middle-income countries, would reduce the overall salary bill by 31 percent, equivalent to the total amount currently being spent by the Ministry of Education and Culture (MoEC) on university education (IDR 22 trillion).

Figure 68: Estimates of government spending on basic education teachers for student-teacher ratios, 2009
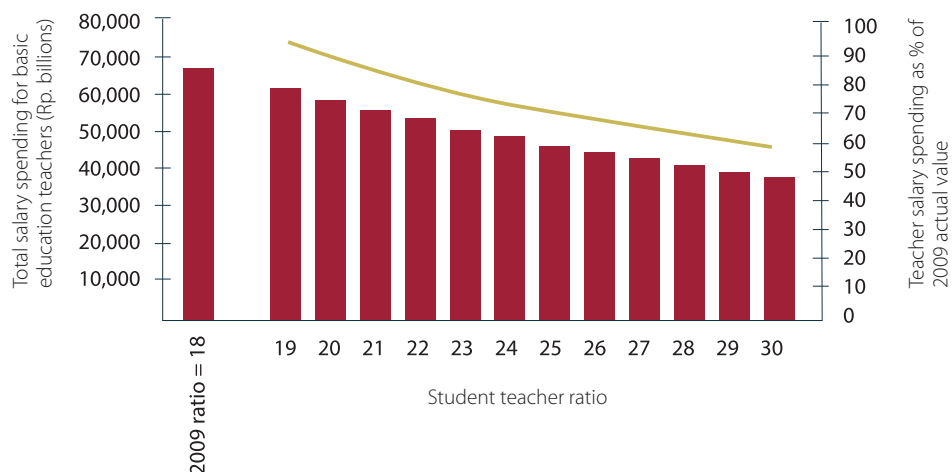
Source: Own calculations based on APBDN (2009)

The Government of Indonesia (GoI) has made significant efforts to improve efficiency and equity in the allocation of teachers. The GoI has issued various regulations over the last five years that have set standards for school staffing levels. However, the staffing norms associated with each regulation are different and provide different guidance on standards. This has caused some confusion and difficulty in interpreting the regulations and has complicated the monitoring of compliance at the school, district and provincial levels. As the hiring institution, districts also issue their own regulations on staffing norms and these can go beyond the minimum staffing levels implied by national standards.

We can use the latest guidelines (the joint decree) to identify understaffed and overstaffed schools and estimate the extent of the reallocation needed for all schools to meet the guidelines. The magnitude of this reallocation can be interpreted as a measure of the inequality in teacher distribution. The guidelines clearly define the minimum number of teachers required in a school according to its characteristics. Using the latest school-level information on teachers and student numbers, it is then possible to identify which schools have insufficient teachers and which have too many.

Under the technical guidelines of the joint decree, the number of teachers necessary for current levels of provision is smaller than the existing teaching force. There are large mismatches in the existing stock of teachers in primary and junior secondary schools. At the primary level, the number of teachers required is approximately 100,000 less than existing levels. The magnitude of the reallocation needed to make the distribution of teachers more equitable is massive – 340,000 teachers or about 17 percent of the total teaching force would have to be transferred. Most of this redistribution would involve moving teachers within districts. However, approximately 74,000 teachers would need to be moved from districts with excess teachers to deficit districts in the same province (Figure 70).

Figure 70: Percentage of primary school teachers that would need to be transferred to comply with joint decree
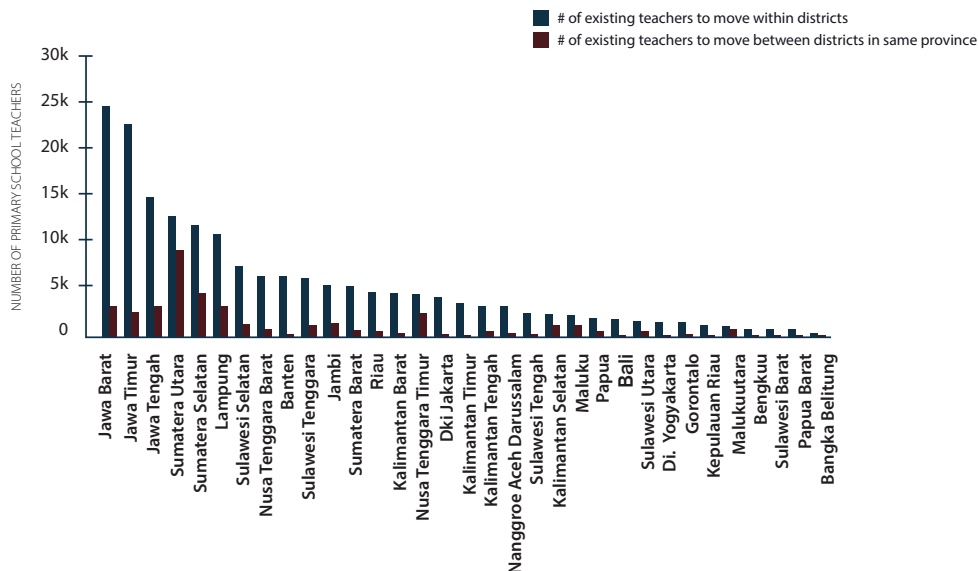
Note: The estimates show the number of teachers currently in schools with excess teachers (according to the joint decree) that could be transferred to take up teaching in schools with deficits in their staffing levels. Class-based, sport and local content teachers are included in the estimates. The estimates include both PNS and non-PNS teachers.
Source: MoEC school data (2010) and NUPTK Data (2010)

In order to contain the growth of the teaching force, local governments must face the true cost of hiring teachers. The joint decree provides a reporting mechanism to contain teacher hiring excesses. Combining this reporting mechanism with a transparent and improved system of setting quotas for civil service hiring could go some way to improving teacher hiring decisions[a]

A more direct approach to eliminating incentives for over-hiring would be to break the link between intergovernmental transfers and teacher hiring. The current system for hiring civil servant (PNS) teachers creates strong incentives for local governments to continue to increase the size of their teaching force and accelerate the conversion of contract teachers to PNS status. At present, intergovernmental resource transfers are partly determined by the size of a local government's payroll. Districts with larger numbers of civil servants receive more from the transfer system. Key to addressing this issue would be the elimination of the link between the size of the civil service and the size of a local government's General Allocation Fund grant (DAU) allocation.

[a] For example, quotas for teachers could be based on national staffing standards and district school-age populations rather than local government assessments of teacher need.

⬭ **Example 18: Cost projections**

Tajikistan PER (2013)

Overall comment:

This review provides an example of projecting the education costs that would be needed to pay for the implementation of various national policy options, including expanding preschool education, increasing teacher salaries, and accommodating projected enrollment increases in Tajikistan. It estimates the additional spending needs associated with each option as a share of the country's gross domestic product.

The government intends to further increase educational spending. In the short-term, the planned increase will be focused on increasing teachers' and principals' wages and investing in school infrastructure. In the long-run, as stated in the National Education Development Strategy Up To 2020, the government aims to increase education spending—up to 6 percent of GDP by 2015 and not less than 7 percent of GDP by 2020.

To accommodate various investment needs, higher spending on general secondary education may be warranted. Table 11 shows public spending on general secondary education in 2009 to 2011, which remained stable at around 2.7 to 2.8 percent of GDP. Using 2011 spending as a baseline, Table 12 illustrates potential additional public spending to (i) accommodate projected enrollment increases in the next decade, (ii) expand one-year preschool for all six year-olds, (iii) increase salaries for educational personnel, and (iv) increase instruction hours. This may drive the general secondary education expenditures up for additional 1.2 to 2.7 percent of GDP (in 2011 prices). Any increase in education spending should be considered within the overall government budget envelope with the identification of priority policy interventions and assessment of their efficiency and costs. Sustaining high growth rates would allow for higher per pupil spending without sizable increase in educational spending as percentage of GDP.

Table 11: Public spending on general education, 2009-2011

	Million TJS			Million US dollars [1/]			Percentage of GDP		
	2009	**2010**	**2011**	**2009**	**2010**	**2011**	**2009**	**2010**	**2011**
Personnel costs	390.5	451.5	536.9	94.3	103.1	116.5	1.89	1.83	1.79
Goods and services	87.3	109.1	122.7	21.1	24.9	26.6	0.42	0.44	0.41
Other rec. expenditures	1.0	1.3	1.7	0.2	0.3	0.4	0.00	0.01	0.01
Capital expenditures	106.7	113.0	163.3	25.8	25.8	35.4	0.52	0.46	0.54
Total	585.5	675.0	824.6	141.3	154.1	178.9	2.84	2.73	2.74

Source: Tajikistan BOOST v0.4 government expenditure database.
Note: 1/ Exchange rates at 1US$ - TJS 4.14 in 2009, TJS 4.30 in 2010, and 4.61 in 2011.

Table 12: Additional annual spending needs for various policy options at 2011 prices

	Million TJS[1/]	Million US Dollars[1/]	Percentage of GDP[2/]
Accommodating projected enrollment increases during the next decade	143-250	31-54	0.47-0.89
New construction of additional 550 classrooms per year	88-158	19-34	0.29-0.53
Renovation of 400-700 classrooms per year	46-83	10-18	0.15-0.28
Recurrent cost to accommodate additional students (27,500) per year	9.4	2.0	0.03
Expansion of one-year pre-school for six year-olds	98-155	21.4-33.6	0.32-0.51
New construction of 600 classrooms per year over 6 years (3,550 classrooms in total) for 177,000 six year-olds	97	21	0.32
New construction of 250 classrooms per year over 6 years (if 2,000 classrooms are available for pre-school)	40	8.8	0.13
Additional recurrent cost per year of enrolling all 6 year-olds (i.e. 177,000 additional children)	58	12.6	0.19
Increasing salaries	60-270	13-59	0.2-0.9
Increasing salaries for all education personnel by 30 percent	270 [3/]	59	0.90
Increasing salaries only for teachers by 30 percent [4/]	180	39	0.60
Increasing salaries for lower categories by 20 percent [5/]	60	13	0.20
Increasing instruction hours	60-120	13-26	0.2-0.4
Increasing instruction hours by 10 percent (i.e. increasing teacher salaries by 10 percent)[4/]	60	13	0.20
Increasing instruction hours by 20 percent (i.e. increasing teacher salaries by 20 percent)[4/]	120	26	0.40

Source: World Bank Staff estimates.

Notes:
[1/] Exchange rate at 1 US$ = TJS 4.61
[2/] Based on GDP In 2011 (TJS 30.1 billion or US$ 6.52 billion).
[3/] The data on personnel costs for all educational staff are available only up to 2011, and no breakdown by type of staff (teachers, school administrators, non-teaching staff, and government administrators) is available. While teacher salaries increased substantially in September 2011 (by 30 percent) and September 2012 (by 60 percent), that was not the case for other staff. Hence, it is assumed that total personnel costs increased by 20 percent (two-thirds of the teacher salary increase) between 2011 and 2012, and another 40 percent (two-thirds of the teacher salary increase) between 2012 and 2013. Based on this assumption, total personnel cost in 2013 is assumed to be TJS 902 million (TJS 537 million or 1.15 x 1.3), which is used as the baseline.
[4/] Assuming that personnel costs for teachers include two-thirds of total personnel costs for general education.
[5/] Assuming that one-half of teachers will be subject to this increase.

Jordan PER (2016)[a]

Overall comment:

The Jordan Response Plan 2016-2018 case provides a good example of projecting education costs to meet specific, national education goals and targets. The analysis provides details on indicators used in the education sector vulnerability assessment and costing analysis in accordance with national norms and standards on class size, number of classes per school, and student-teacher ratio. However, the Jordan Response Plan approach goes beyond abiding by national standards on core education-system indicators. It proposes a number of projects and sector-specific objectives aimed at improving access to quality and inclusive education for Syrian refugees and vulnerable Jordanians.

The Jordan Response Plan 2016-2018 estimates education sector needs by carrying out an education sector vulnerability assessment at the district level by using the three indicators of school size, class size, and student-teacher ratio. It defines the national standard for class size at 27, thereby identifying vulnerability to crowding in classes to be most severe in seven districts of the four governorates with high concentrations of Syrian refugees, i.e. Amman, Zarqa, Irbid, and Mafraq.

The assessment further finds that 150 new schools would be needed to meet a national standard of 19 classes per school, which translates to a school size of 513 (assuming an average class size of 27). These schools would be located primarily in the same four governorates with highest concentrations of Syrian refugees. Finally, the assessment finds that an additional 8,600 teachers would be needed to meet a national standard of 17 students per teacher. In other words, the MOE is aiming to absorb the Syrian students while maintaining its current class size and student-teacher ratio. In addition, new schools to be constructed are to accommodate above 500 students, which is greater than the current average school size.

Beyond abiding by national standards on core education system indicators, the *Jordan Response Plan 2016-2018* aims to apply lessons learned from past refugee crises and enhance the Government's ability to respond to emergencies while at the same time strengthening the education system's resilience. This resilience implies that the education system is able to adapt and maintain quality in the face of potential new crisis scenarios. Rather than relying on the unit cost approach, the Plan proposes a number of projects that aim to improve access to quality and inclusive education for Syrian refugees and vulnerable Jordanians, boosting the capacity of the public education system with additional learning spaces, remedial/catch-up classes for those children who have missed out on weeks or months of schooling, and access to improved and diversified certified alternative learning opportunities for children and youth. Projects are also to deliver capacity building of teachers to safeguard the quality of education. The resulting three-year Plan starts with a baseline number of 156,663 Syrian children enrolled in education services (whether formal, non-formal, or informal), and targets increases in enrolment to 222,000 in 2016; 248,000 in 2017; and 272,800 in 2018. The increased enrolment is not expected to result from influx of additional Syrian refugees into Jordan, but rather from increased enrolment rates of Syrian children already in Jordan.

A range of projects are proposed in the Plan, spanning improving the capacity of education authorities to ensure the continuous delivery of quality inclusive education services; enhancing access to safe and protective learning spaces; and increasing provision of adequate, protective, and safe learning spaces and facilities. In terms of associated costs, over US$850 million are estimated over the 2016-2018 period, with over US$470 million dedicated to facilities, i.e. construction of 150 new schools and additional classrooms or renovation of 450 prioritized schools. The fact that attention is being paid not only to construction of new schools but also to adding classrooms to existing schools is warranted given the relatively small average school size in Jordan. In other words, the Plan recognizes the necessity for a dual approach that is based on detailed analysis of the needs on the ground in specific locations in the country. The next largest project at over US$180 million includes the hiring and pay of teachers.

[a] The external link to the document is expected to become available in June 2017.

Democratic Republic of Congo PER (2015)

Overall comment:

The DRC case briefly analyzes the government's projection of the budget required to implement the medium-term education-sector strategy. It identifies strengths and weaknesses in the way that the government conducted its cost analysis, and explains potential challenges to the projected medium-term strategy.

The medium-term outlook of the education sector strategy does not address the current challenges arising from the financing of the education sector. From the recently adopted 2016-2025 sector strategy, the projected budget still shows high dependence on donors. It was also planned with a significant financing gap, which has not been addressed. However, the projection of the costs based on the new sector strategy reveals both good and bad news. The good news is that the functional classification by level of education is well-crafted which is very promising for sectorial analysis at the monitoring and evaluation stages. And the strategy planning is based on the focused and measurable targets, which is also important. On the negative side, there are three core areas of concern: (i) the ministry of budget needs to establish a clear budget line for each level of education and properly plan according to the budget lines- the lack of clear and consistent budget nomenclature is one of the drawbacks for this analysis, (ii), the projected strategy has not taken private provision of schooling into account both in terms of cost and the human resources needs, and (iii), projected scenarios are missing the demographic aspect of the unit cost, which currently is projected to increase over time in US dollars. The unit cost calculation is also based on the expected funds from outside resources, which may or may not be realized.

Figure 40: Medium-term outlook of public spending on education by sources and unit cost projection, 2016, 2025
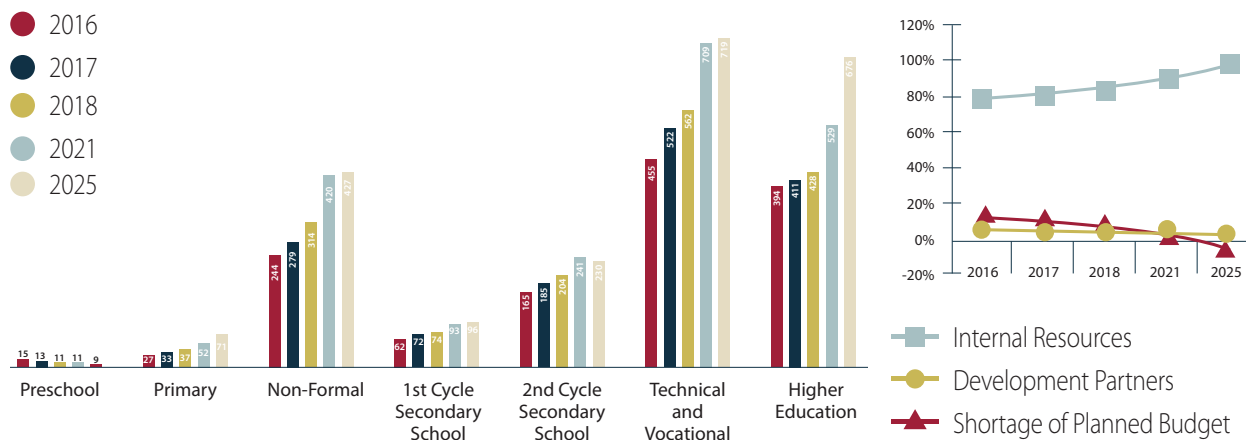
Source: Education Sector Strategy, 2016-2025, January 2015

Based on the projected GDP growth, the government could afford to increase the budget for the education sector especially given that education is one of the top five priority sectors designated by the authorities. Education spending as share of GDP is projected to reach only 3.4 percent by 2025 (Figure 41) which is still below the current SSA average (5.0 percent) and the minimum suggested rate of 4.7 percent. Just as with the unit cost analysis performed in the last sector strategy, the main concern with the projected estimate for the new sector strategy is that the capital spending still heavily depends on external sources (about 44 percent annually) especially given the recent history of low execution rate for external resources.

Table 41: Medium-term outlook of public spending on education by sources and unit cost projection, 2016, 2025
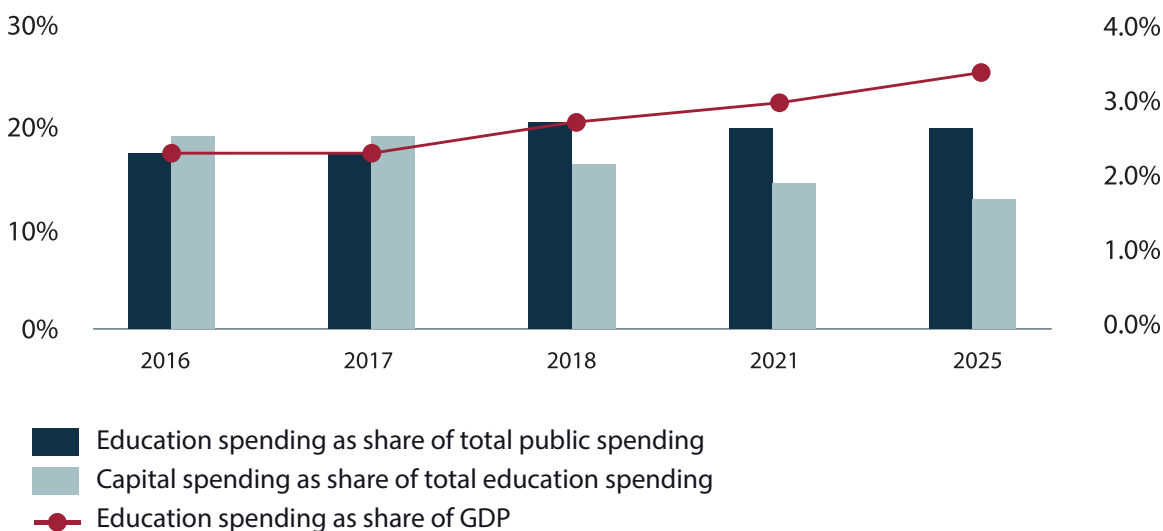
Source: Education Sector Strategy, 2016-2025, January 2015

⬤ Example 19: Fiscal sustainability analysis

Albania PER (2014)

Overall comment:

The Albania public expenditure review conducted a long-term fiscal sustainability analysis with specific policy recommendations. Based on the assumption that the country's fiscal consolidation program will be implemented as planned, it examines the impact of the proposed increases in public education spending on the public debt.

In the short to medium term, given the lack of fiscal space and the fiscal consolidation plan in place for the period 2014-16, Albania should carry out reforms to make the social sectors more efficient and do more with the same level of budgetary resources. In the medium to long term, particularly starting with 2017, Albania could consider increasing public spending on education, with a clear recognition of the trade-offs – that increased public spending will lead to a higher public debt-to-GDP ratio (relative to the baseline) but that given the needs in the sector such investments may be worthwhile.

The key public spending recommendations with implications for fiscal sustainability related to education are as follows:

Increase public spending on education, as fiscal space opens starting from 2017, from the current 3 percent to about 4 percent of GDP, bringing Albania closer to its regional peers in terms of the level of public spending on education. The additional public spending could be channeled to several areas in which Albania still needs investment, such as teachers' professional development; learning materials and school supplies; quality of school facilities; and, more time on tasks and activities in schools.

The assumptions behind a baseline scenario for Albania's fiscal sustainability are as follows: the current fiscal consolidation program for the period 2014-2016, both on the revenue and on the expenditure side, will remain in place and will be implemented as planned. Under this scenario, Albania's public debt-to-GDP ratio will fall from 72 percent in 2014 to 69.7 in 2016, including the clearance of arrears of 5.3 percent of GDP over three years. Beyond 2016, the baseline scenario assumes that the fiscal consolidation continues between 2017-2022, with the expenditure to GDP ratio declining from 28.7 percent in 2016 to 25.2 percent in 2022, while revenues staying at 25.2 percent of GDP. Public debt-to-GDP reaches 49.7 percent at the end of 2022 under the baseline.

Relative to the baseline scenario, the impacts of the proposed increases in public spending on education and health (from 2017) on the public debt-to-GDP ratio are presented in Figure 6.1.

An education spending increase scenario assumes an increase in education public spending from the current 3 percent of GDP to 4 percent of GDP starting in 2017 and continuing throughout the considered period. The effect of this will be to increase Albania's public debt-to-GDP ratio by 5.2 percent of GDP by 2022.

Figure 6.1: Albania public debt to GDP ratio under increased education and health sector spending, 2017-2022
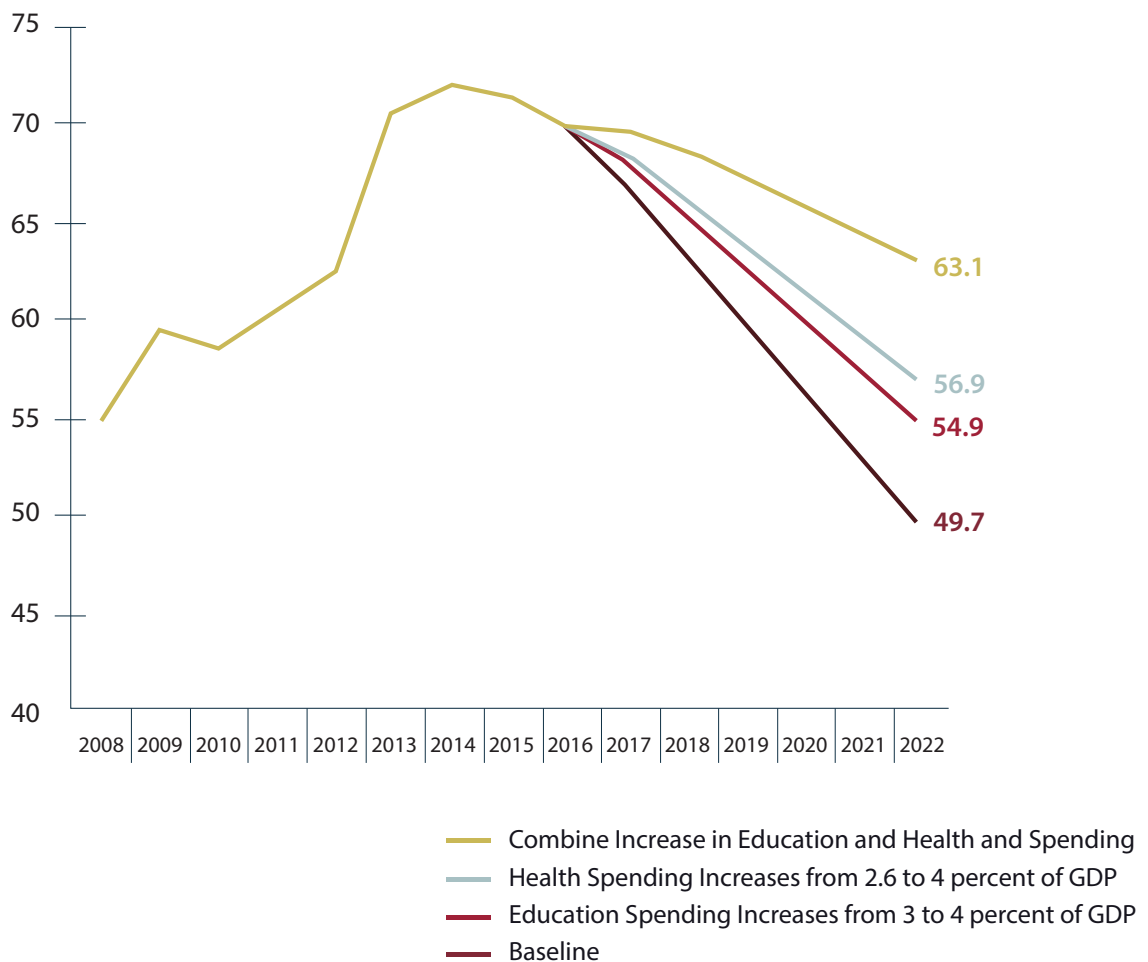
Source: World Bank staff calculation

Madagascar PER (2015)

Overall comment

The wage bill in the education sector has to be carefully monitored for its fiscal sustainability and for the presence of "fiscal space" to cover non-wage, recurrent expenditures and capital expenditures required to complement teachers.

This example from Madagascar assesses the trajectory of the current wage bill and simulates the fiscal consequences of a planned Government policy that would integrate community teachers into the civil service. Community teachers are locally hired and employed by parents' associations. They consist of two groups: (i) subsidized teachers, who receive salaries from the State, and also, depending on the local context, additional funding from parents; and (ii) non-subsidized teachers, who receive salaries solely from parents. Integrating these teachers into the civil service shifts their entire wage payment to the central government.

The share of regular teachers' salaries in the budget has been fast increasing, and the wage bill has reached unsustainable levels. Looking at changes in regular salaries is informative to address issues of sustainability because regular salaries are not flexible downward. Using more recent data from the MFB/SIGFP shows that the share of regular salaries is following a fast increasing trend, reaching over three fourths of the education executed budget in 2013 (Figure 15). Although this is still within reasonable limits, the trend is not sustainable. The recent announcement that 10,000 community teachers will be absorbed into the civil service in 2014, and another 10,000 in 2015, are in that sense worrying (see Box 7 for more details).

Figure 15: Evolution of real education expenditures by broad economic category
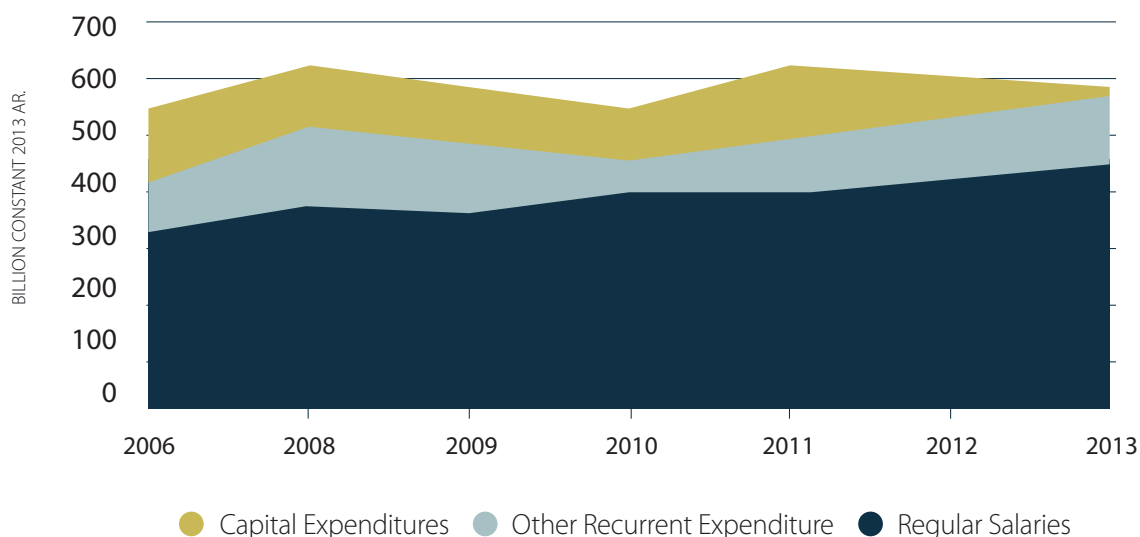
Source: Data from MFB-SIGFP.

Box 7. The Impact of the Regularization of Community Teachers as Civil Servants

Recent political decisions in the sector include the progressive integration of community teachers in the civil service. Analyses carried out under this PER have aimed at estimating the potential impact on the MFB budget of such integration, using various scenarios. Projections for 2020 show that the number of teachers would reach 96,100 for an expected 5.2 million children in primary school. This would translate into the recruitment of an additional 68,000 civil servants compared with 2014. An analysis of the potential impact of this decision on public spending on education is presented below. The evolution of the macroeconomic context was simulated using two different scenarios, in line with the recent scenarios elaborated by the IMF. More details on the methodology and scenarios for the macro context are provided in the case study developed for this PER.

In addition, the analysis examined two different hypotheses for integrating community teachers in the civil service:

- Hypothesis 1: all community teachers are integrated in the civil service as early as 2016, and new teachers are hired as civil servants.

- Hypothesis 2: community teachers are progressively integrated in the civil service to ensure that all teachers are civil servants by 2020. More specifically, this hypothesis assumes the integration of 10,000 community teachers in 2016, 15,000 in 2017, 15,000 in 2018, 16,000 in 2019 and 16,960 in 2020.

The results of projections show that Hypothesis 1 is unsustainable even in the most favorable case of the evolution of the macroeconomic context. Indeed, from 2016 onwards, the salary needs for primary schools would amount to 550 billion MGA. This amount exceeds the global amount of the 2014 MFB budget, which was 541 billion MGA in 2014, and is 10 times larger than the current amount allocated to community teachers' subsidies.

In the case of Hypothesis 2, the results of projections show that the integration of 10,000 community teachers in 2016 and as many in 2017 would result in salary costs equivalent to about 300 billion Ar in 2016 and as much as 350 billion Ar in 2017. This compares with 286 billion Ar and 318 billion Ar projected for salary costs in 2016 and 2017 respectively. Under both scenarios 1 and 2, the wage bill would amount to 600 billion Ar by 2020, far above the projected resources available

Simulating the impact of the integration of community teachers

HYPOTHESIS OF RESOURCE NEEDS
- H1
- H2

MOBILIZATION POTENTIALSCENARIO
- S1
- S2
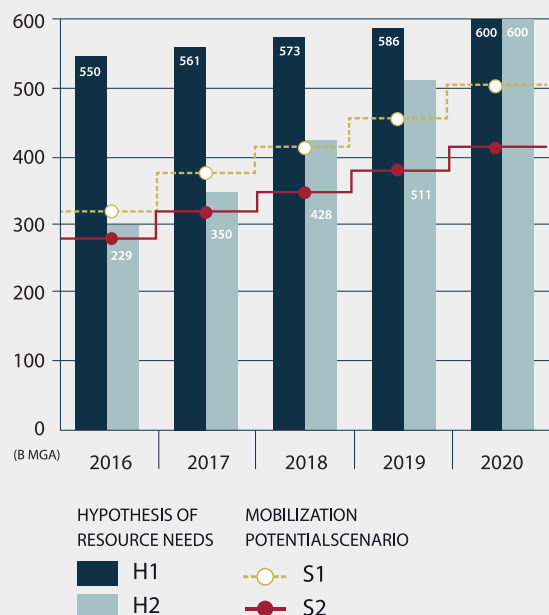
for salaries under scenario 1 (504 billion Ar) and scenario 2 (414 billion Ar). This scenario seems hardly sustainable even in the case of favorable economic growth (Scenario 1), and completely unrealistic in case of a slower economic growth (Scenario 2).

The results of these simulations show that the integration of community teachers as planned will have large and unsustainable consequences on the MoE budget. To improve its feasibility, it would seem essential to envisage one of the following options: (a) dramatically slow down the progression of integration, or (b) allocate more resources to education. Even in the latter case, this simulation shows that the integration of community teachers into the public service, even if progressive, will result in further increasing the already high weight of salaries in the MoE budget. The interventions aiming to improve the quality of education, such as the improvement of infrastructure, but also teacher training and the improvement of the availability of learning material, could therefore not be financed by the State budget.

⬭ Example 20: Demographic trends and enrollment projections

Guinea PER (2015)

Overall comment:

This analysis shows the projected enrollment and education-funding gap based on demographic trends and different gross domestic product growth scenarios. It concludes that the current level of funding is a real constraint given the projected population growth in the country.

Guinea has one of the highest levels of population growth in the world: 52 percent of the Guinean population is composed of women, and fertility rates are among the highest in the region at 5.1 live births per woman, and even higher in rural areas at 5.8 live births. The school-age population (ages 3 through 25) comprises almost half the population in Guinea, and grew at about 2.8 percent annually between 2008 and 2013.

The current level of funding is a real constraint given the projected population growth. Enrollments have expanded, but the capacity to serve students lags behind what is needed given Guinea's large and growing school age population. If the education sector continues to receive less than 3 percent of GDP, and 13 percent of public resources—and the country does not improve its resource use—an increasing number of children and youth will be out of school. To illustrate this point, assuming that current gross enrollment ratios will hold steady–9 percent at the pre-primary, 98 percent at the primary, 45 percent at the lower secondary, and 25 percent at the upper secondary levels - enrollments across all levels would have to increase by 620,000 students by 2020 just to accommodate the population growth.

If the public sector continues to serve the same share of students, this would mean an additional 414,000 students enrolled in public schools. To support that kind of growth, under current resource use patterns, Guinea's public education spending on operating costs only must grow by one fourth in real terms, which is only possible under current resource allocation patterns if the economy grows by 3 to 4 percent annually— faster than the population. If growth rates averaged to 2 percent, for example, by 2020, another 124,000 children, or 2 percent of the projected school age population in 2020, would be excluded from education (left panel of the figure below). To serve this additional population—that is, just to keep the out-of-school youth rate at its 2012 level—the funding for operating expenditures would have to grow by GNF 1.1 billion in real terms. That would mean the education sector would have to double or receive 2 percent more of the country's GDP.

Projected enrollment gap and operating expenditure gap due to population growth
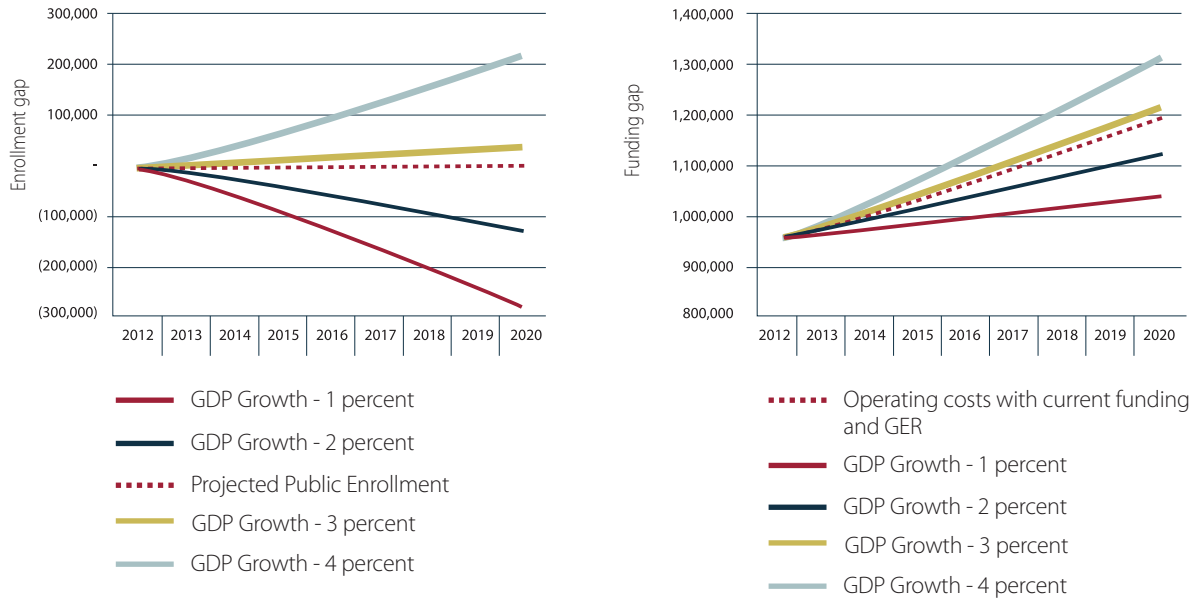
Source: World Bank Staff calculations using population data from U.S. Census international databases, expenditure and enrollment data from MEF, and dropout rates from ELEP 2012.

Belarus PER (2013)

Overall comment:

The Belarus analysis examines the implications of the declining number of students in the country, particularly in rural areas, for the size of the education workforce and school network. Although Belarus has made progress in consolidating its school network in response to demographic trends, it has not seen a commensurate adjustment in the number of teachers, which has remained relatively stable. Student-teacher ratios have declined, particularly in rural areas, with significant implications for per student costs.

The education system must adjust to a dramatic decline in the number of students. Belarus' population is projected to decrease to 8 million in 2050 from more than 10 million in 1995. The school-age population has decreased dramatically during the last 40 years: from 1.9 million in 1970 to 0.9 in 2010 (Figure 75). Just in the last four years, the number of students in general secondary schools declined by 14.1 percent. At the same time, the number of people living in cities has almost doubled during the last 30 years (from 4 million in 1970 to 7.2 million in 2011). As a result, the demand for education, particularly in rural areas, collapsed. Based on current fertility and internal migration rates, population dynamics among school-aged cohorts in urban areas are expected to stabilize over next two decade, while the decline in rural areas is expected to continue.

Figure 75: Number of students has declined, especially in rural areas

Demographic trends 1970-2030 (thousands)
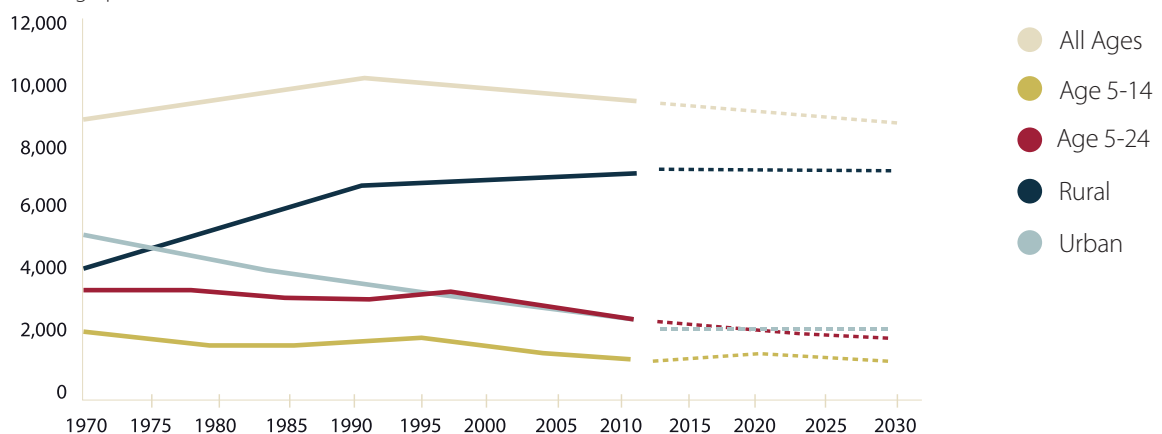
Source: UN, Beistat.

In response to these trends, the Government has begun to right-size the school network. Accommodating such large shifts in student enrollment is tremendously challenging for a school system because it involves closing down schools, a politically difficult task in any country.

Nevertheless, Belarus has made progress consolidating its school network. Since the early 1990s more than 1,200 schools were closed, equal to about 30 percent of the existing schools at the beginning

of the period (Figure 76). School closures accelerated in the 2000s, and every year since 2002 more than 100 school have closed annually. Impressively, school closures have kept pace with the declining number of student.

Figure 76: Consolidation of school network

1991=100
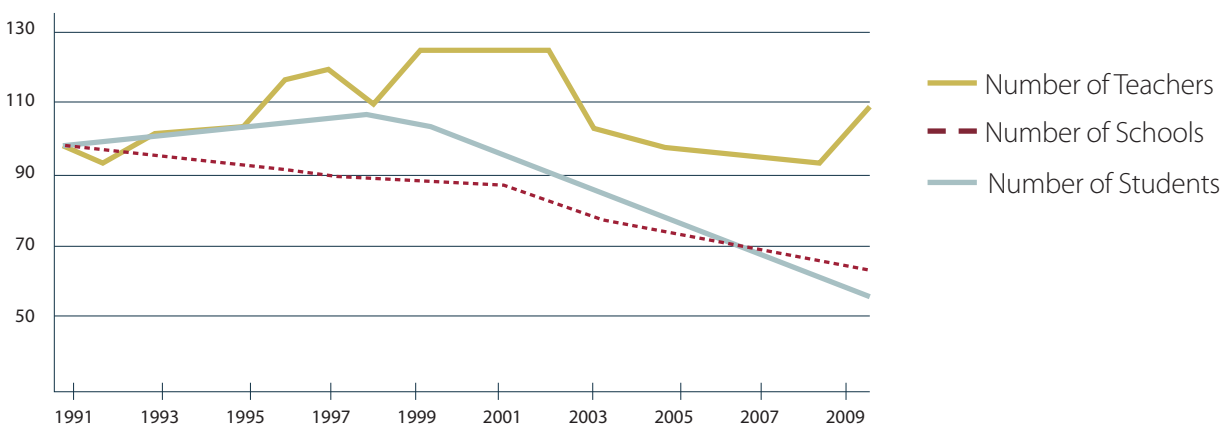
Source: CISSTAT. "Statistics of the Countries of the CI5," MOE (2011).

However, the size of the education workforce has not seen a commensurate adjustment, and consequently student-teacher ratios have declined, with significant implications for per student costs. The number of teachers has remained relatively stable despite the significant decline both in the number of students and schools (Figure 76).

Student-teacher ratios at both primary and secondary have continued to fall and are among the lowest in the region (Figure 78). Since teacher salaries are the single largest cost item, this increase in the number of teachers per student has been associated with a significant increase in per student costs.

Figure 78: Student-teacher ratios are among the lowest in the region

Primary school student-teacher ratios in the ECA region 1999-2009

Secondary school student-teacher ratios in the ECA region 1999-2009
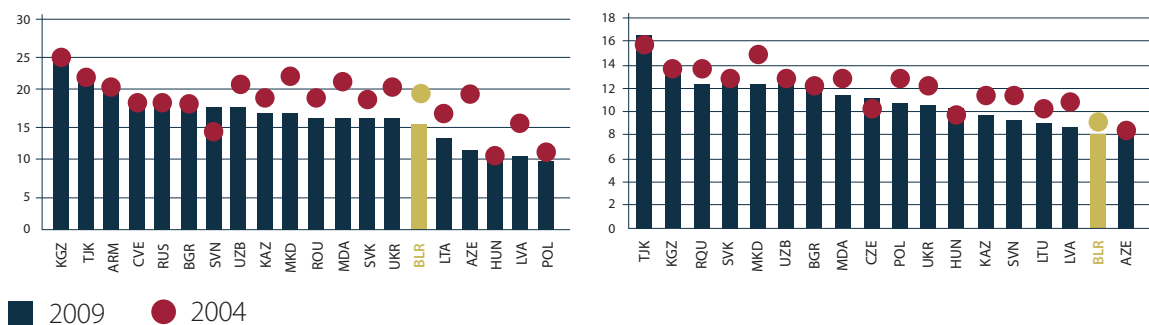
Source: EdStats database.

Schools in rural areas are particularly resource intensive. As a result of demographic change and urbanization, rural areas have seen the sharpest declines in population and student numbers. While rural schools tend to be smaller everywhere, there continues to be a quite substantial misalignment in the demand and supply of education services between rural and urban areas (Figure 79).

Figure 79: Most students are in urban area while most schools are in rural areas
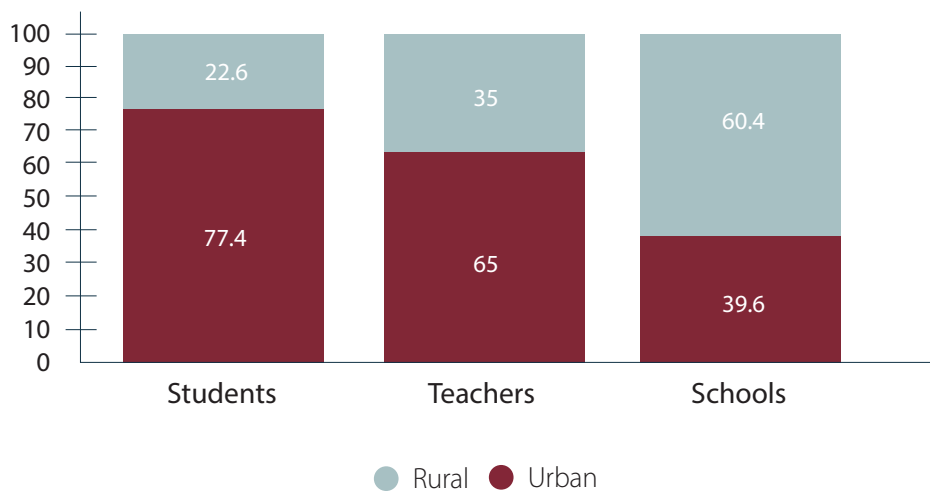
Student-teacher ratio in secondary schools
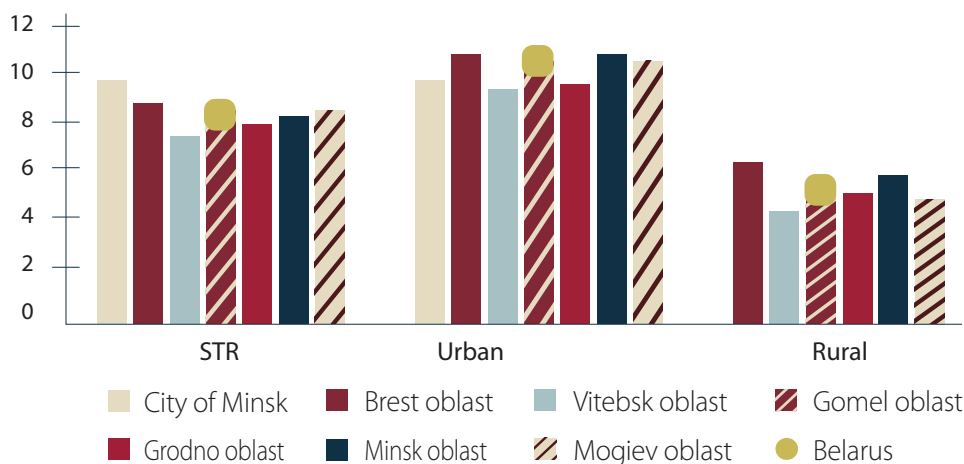
Source: Belstat, MOE

While the majority of students (about 77.4 percent) now reside in cities, 60.4 percent of schools and 35 percent of teachers were located in rural areas. Equally, the student-teacher ratio is substantially lower in rural areas, or as low as 4.6 in rural areas of Vitebsk oblast. While rural schools are important in providing access to education, the resource intensity drives up per student costs. School-level data would be necessary to understand whether such resource differentials are justified, and how they could be optimized either by within-school reorganization or school consolidation.

Georgia PER (2015)

Overall comment

This review analyzes the fiscal and equity implications of a policy that provided free preschool. The policy is expected to increase enrollments, but reduce local government revenues, as a result of the elimination of fees. The analysis provides four different scenarios, based on different assumptions about enrollment trends, and explores the impact on equity (the impact of school-fee elimination policy on interregional differences in spending and inequality in the provision of preschool services).

Making preschool education free will also encourage enrollment, which will raise the costs for local governments. Before the fees were eliminated, enrollment rates were much higher among rich than among poor households, ranging from 30 percent in the poorest households to more than 50 percent in the richest. Without fees enrollment rates for less well-off families are expected to rise and enrollment rate gaps are likely to diminish. Regions more heavily reliant on parental fees as a source of preschool funding are generally associated with lower enrollments, except for Tbilisi. This means that with parental fees eliminated, regions that were more reliant on parental fees will be confronted by a more acute increase in costs because of two shocks: (1) higher preschool spending to compensate for the higher parental fee, and (2) a bigger increase in enrollment due to the lower enrollment rate before the change.

Table 4.3: Additional fiscal cost of eliminating preschool fees, million GEL

Scenarios	Estimated Fiscal Impact
Fee Reform Scenario 1 Fixed Enrollment	24
Fee Reform Scenario 2 Fixed Supply	33
Fee Reform Scenario 3 Enrollment Equal to Average in Top Three Consumption Quintiles	27
Fee Reform Scenario 4 Enrollment Equal to Average in Top Consumption Quintile	39

Source: Staff calculations

In different scenarios the immediate increase in preschool spending after the parental fee elimination is estimated to total GEL24–39 million. Four scenarios are considered (Table 4.3). In Scenario 1 enrollment remains the same as pre-reform and the central government compensates for the amount used to be paid in fees by parents. In this scenario the cost of the reform will be GEL24 million. In Scenario 2, enrollment increases so that preschool places currently available are totally filled. In that scenario enrollment will increase by about 10 percent to max out preschool capacity, leading to a higher cost of GEL33 million. Scenario 3 corresponds to the case where enrollment increases up to the average enrollment rate for households in the top three quintiles of the consumption distribution. In that case, enrollment will increase by 4.3 percent, at a cost of GEL27 million. In Scenario 4, enrollment is assumed to increase up to the average enrollment rate for households in the top quintile of the consumption distribution, bringing a 19 percent increase in enrollment and a much larger fiscal cost of GEL39 million.

Interregional differences in spending are likely to exacerbate inequality in the provision of preschool services. For some regions the implied fiscal impact is much heavier than for others, driven by differences in parental fees, enrollment rates, and per child preschool spending (Figure 4.14). Before the parental fee was eliminated there was already a large disparity in the quality of preschool services: for instance, Tbilisi provides much better preschool services and its cost per child is nearly 30 percent higher than the rest of the local governments. After the fee exemption, more developed local governments like Tbilisi are likely to be in a better position to curb the fiscal impact; others where parental contributions were high and enrollment rates low may not be able to fully compensate for the amounts parents used to pay. This will lead to further deterioration of the quality of preschool education in these localities and result in more unequal preschool services across the country.

Figure 4.14: Fiscal impact of parental fee elimination by region
(Additional cost as percent of GDP)
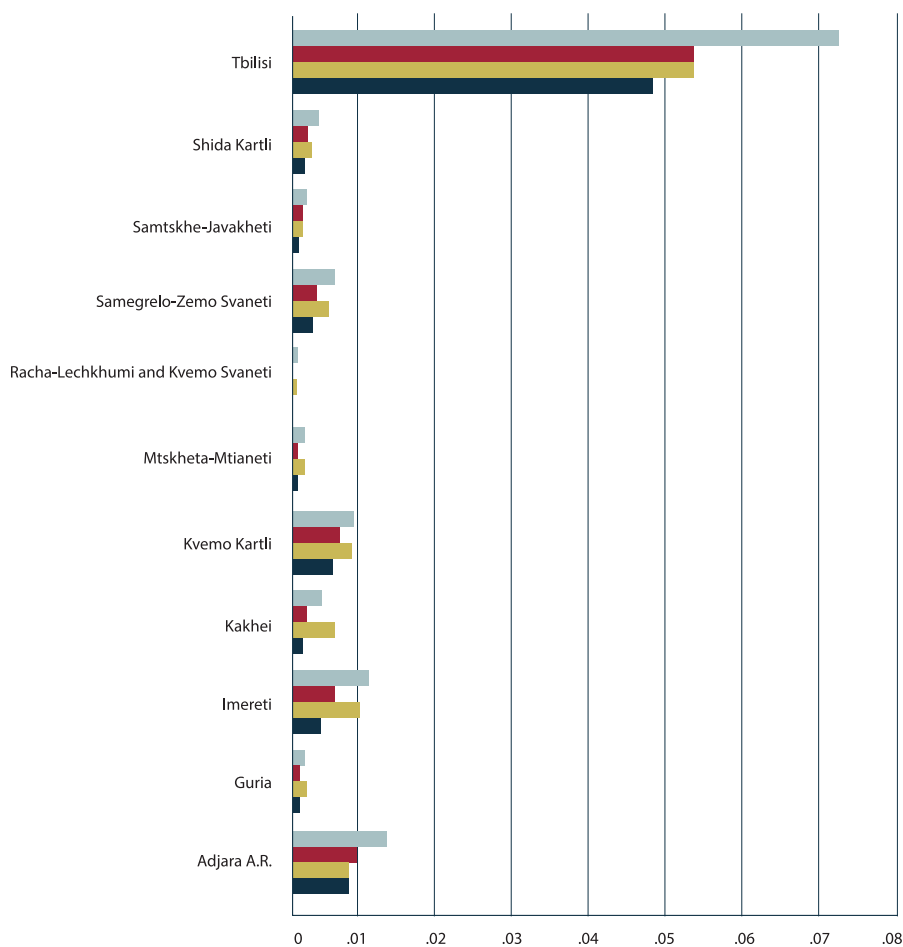
Sources: 2011 WMS and staff calculations.

Legend:
- Enrollment Equal to Average in Top Consumption Quintile
- Enrollment Equal to Average in Top Three Consumption Quintile
- Fixed Supply
- Fixed Enrollment

⬤ **Example 21: Technical efficiency of inputs (efficiency indicators)**

Belarus PER (2013)

Overall comment:

This public expenditure review analyzes the technical efficiency of inputs (student-teacher ratio, and class and school size) in Belarus, comparing them with regional and international benchmarks. It finds inefficiencies in the provision of these education inputs, with the student-teacher ratio among the lowest in the region, and small school and class sizes.

In Belarus, student-teacher ratios at both primary and secondary have continued to fall and are among the lowest in the region (Figure 78).

Figure 78: Student-teacher ratios are among the lowest in the region

Primary school student-teacher ratios in the ECA region 1999-2009
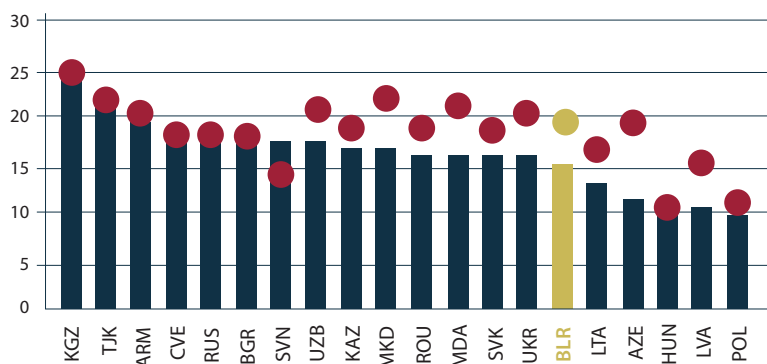
Secondary school student-teacher ratios in the ECA region 1999-2009
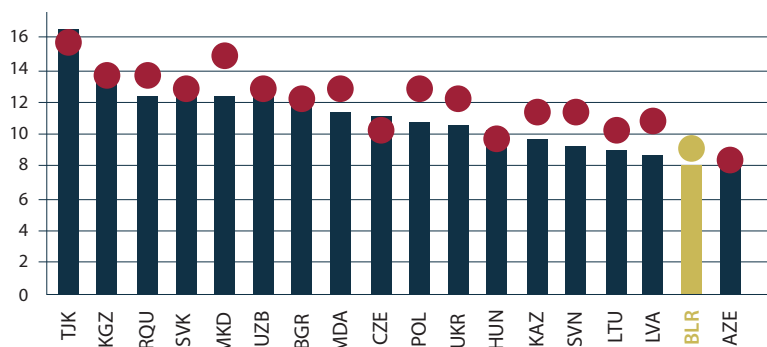
Source: EdStats database.

The average class size is 16 students, compared to 21 and 24 students in OECD primary and lower secondary, respectively (Figure 80). Class size in rural areas is only 9.4, against 20.4 in urban areas.

Figure 80: Class and school sizes are small
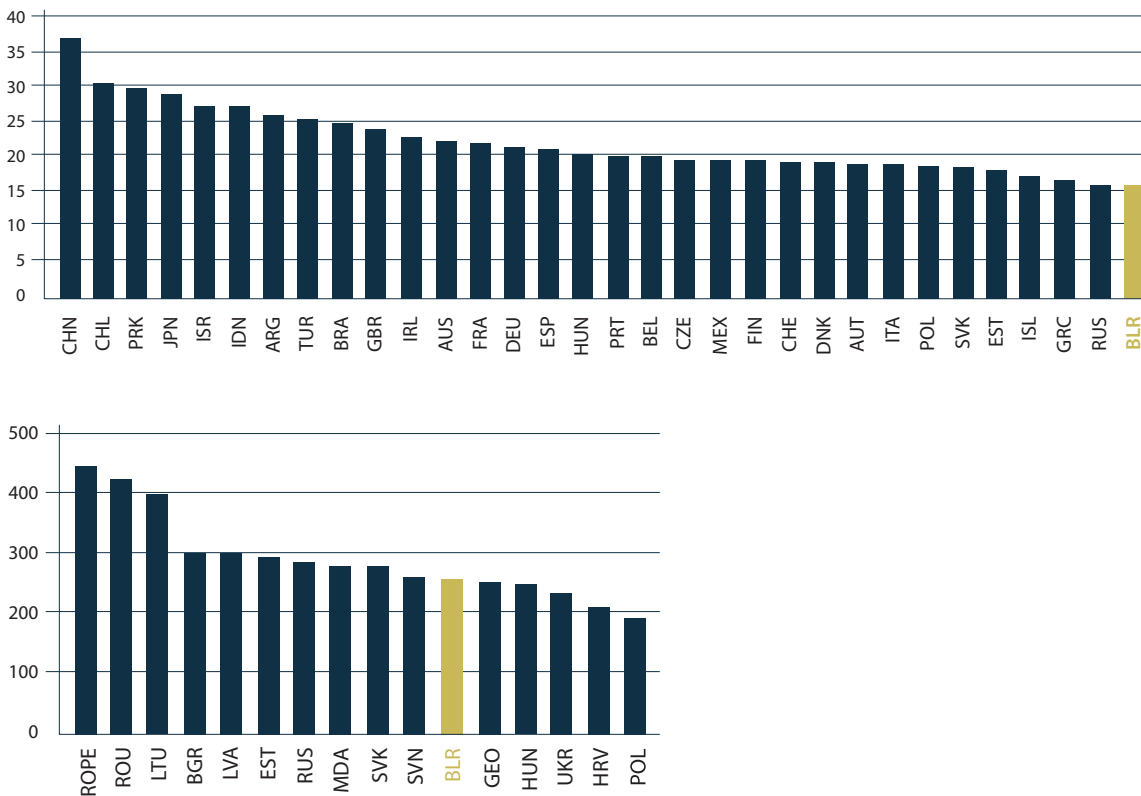
Source: NSI except Poland (BOOST data), Slovakia (Ministry of Education), statistics authorities of CIS countries. "Western Europe" includes other members of the European Union not mentioned in the figure, less Malta and Cyprus, plus Norway, Iceland and Switzerland. OECD at a Glance, 2011.
Notes: Year of reference 2008. Public institutions only (including for Belarus).

Overall, lower student-teacher ratios and smaller classes imply high costs per student, which do not necessarily lead to better learning outcomes.

⬤ Example 22: Analysis of unit costs and outcomes

Albania PER (2014)

Overall comment:

The Albania analysis provides an example where the efficiency discussion in terms of public spending and learning outcomes may not be straightforward. (Both inputs and outputs for the country are low, compared to those for other countries). The Albania case also includes an analysis of the relationship between financial resources and learning outcomes at the subnational level and reveals problems of both inefficiency and equity in spending.

Compared to other countries in the region, Albania's education system gets poor learning outcomes and has low public spending. Hence, it is difficult to determine whether Albania's system is efficient given that both inputs and outputs are low. The figure shows Albania on the curve that best fits international data on outcomes and public spending per pupil. Albania appears among the lowest spending countries in the sample. While the efficiency discussion in terms of public spending and learning outcomes is not clear it is evident that the system has not been effective at providing students with the necessary basic competencies.

Figure 2: International comparison: PISA score and expenditure per secondary student
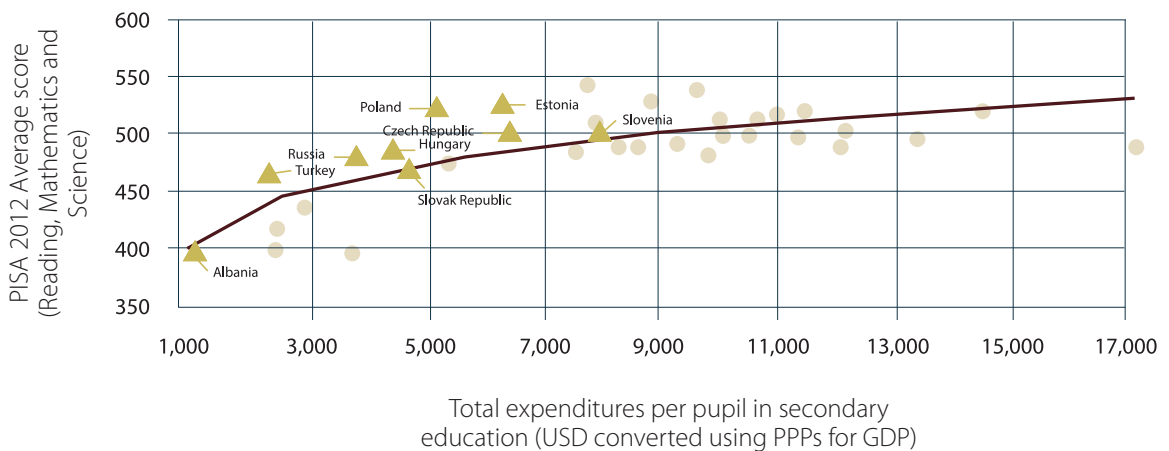
Source: IMF, PISA, and World Bank calculations

Measuring efficiency at subnational level

Results from Matura, the university entrance exam, suggest that financial resources alone do not explain learning outcomes. Figure 2 illustrates the relationship between financial resources and learning outcomes (as measured by 2013 Matura mathematics scores) by district. While the flat blue line is an unweighted average score for the county (average of the blue dots), the flat red line measures expenditures per pupil in each county (right-hand side axis). The figure shows that some counties seem to be more efficient than others in using their resources to produce good learning outcomes. For instance, Qarku Tirane, Vlorë, Elbasan, and Fier spend approximately the country's average and get relatively good results, while other districts spend as much and do not get good learning outcomes.

It is important to stress that this analysis is based on correlation, and thus causality between expenditures and scores cannot be claimed.[a] The figure also suggests that the financing mechanism does not target poorer prefectures (as measured by the share of population in poverty). For instance, Gjirokastër has low poverty incidence and the highest expenditure per pupil, whereas Kukës is poorer and gets a low per capita allocation.

Figure 3: University examination scores and county financial resources
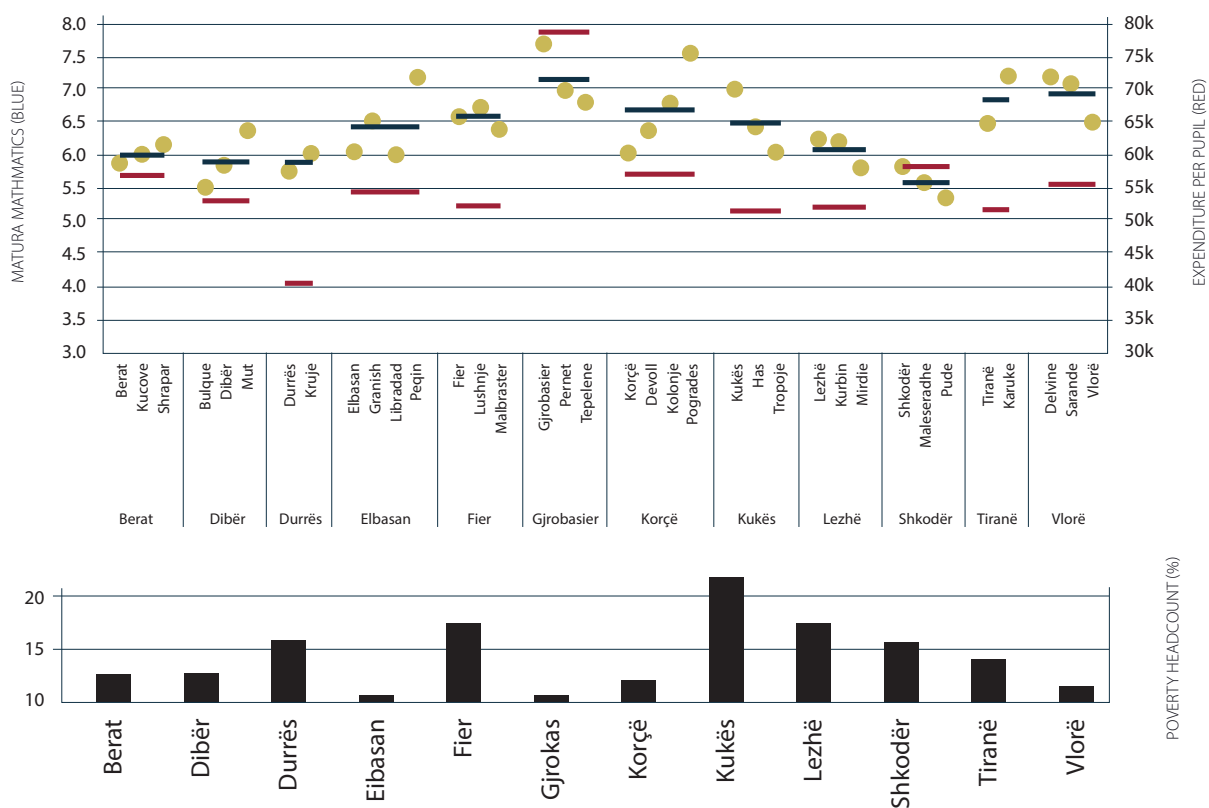
Source: INSTAT, National Examinations Agency, and Ministry of Education and Sports.
Note: Matura results are from 2013; poverty headcount comes from INSTAT's analysis of the LSMS 2012 and measures the share of the population below Albania's poverty line.

[a] For instance, it may be that Gjirokastër's results would have been much lower had it not spent this amount of resources on education.

Belarus PER (2013)

Overall comment:

The Belarus analysis explains why higher per student costs are not translating into better performance outcomes: While a low student-teacher ratio (STR) is driving up per student costs, the quality of teaching has not improved.

In Belarus, demographic change is affecting the demand for education services. Declines in school-age population and urbanization have reduced the number of students, especially in rural areas. As a result, student-teacher ratios at both the primary and secondary level are among the lowest in the region. Teacher salaries remain relatively low, making it difficult to attract and retain skilled labor in the teaching force. While per student costs have risen, this has not necessarily led to better learning outcomes (Figure 12).

Figure 12: Low student-teacher ratio is driving costs, but no leading to better outcomes

Per student cost, thousand BYR
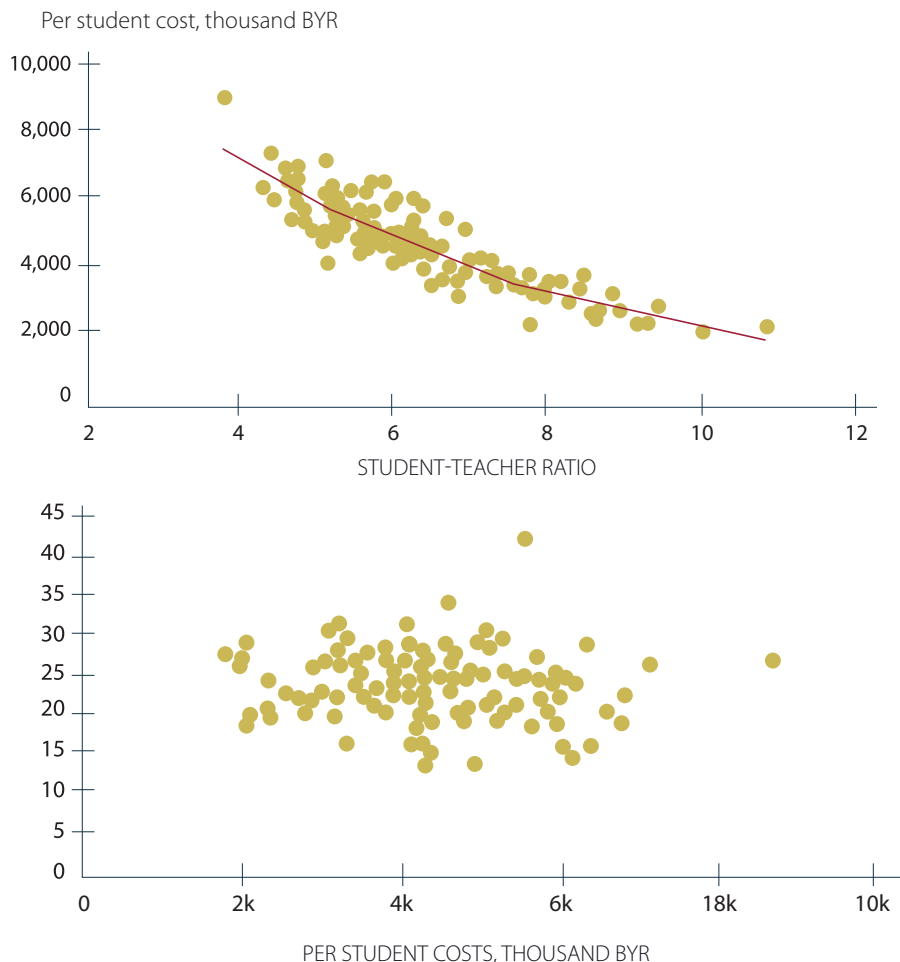
Source: World Bank staff calculations based on BOOST, MOE and Belstat data. Each dot represents a rayon.

Indonesia PER (2013)

Overall comment:

The Indonesia review provides an example of subnational analysis by correlating "changes" in total spending on education and "changes" in enrollments or learning outcomes across districts. It takes into account that districts with different characteristics may need to spend different amounts to reach the same outcomes. By looking at the rates of change in spending and outcomes, this comparison controls for district characteristics that are constant over time.

Correlating spending per student with outcomes may miss an important point: districts with different characteristics may need to spend different amounts to reach the same outcomes. So a lack of correlation in one year may not mean that district spending does not matter for outcomes. A cleaner comparison is obtained by regressing changes in resources with changes in outcomes. If district spending on education matters for education outcomes, districts that increase their spending faster than other districts should experience a faster improvement in outcomes. By looking at the rate of these changes, this comparison controls for district characteristics that are constant over time.

The Indonesia 2013 PER analysis shows no correlation between changes in total spending on education and changes in enrollments or learning outcomes across districts (Figure 57). The fact that increasing spending is not correlated with improvements in outcomes means that further increases in spending, given all other factors unchanged, will be unlikely to be associated with improved outcomes, and that outcomes may vary across districts regardless of changes in spending.

Figure 57: Change in public education spending and change in education outcomes at the district level

a) SMA NER, total spending (2002-2009)

b) SMA NER, non-salary spending (2002-2009)

c) SMP NER, total spending (2002-2009)

d) SMP NER, non-salary spending (2002-2009)

e) SMP UN score, total spending (2005-2009)

f) SMP UN score, non-salary (2005-2009)
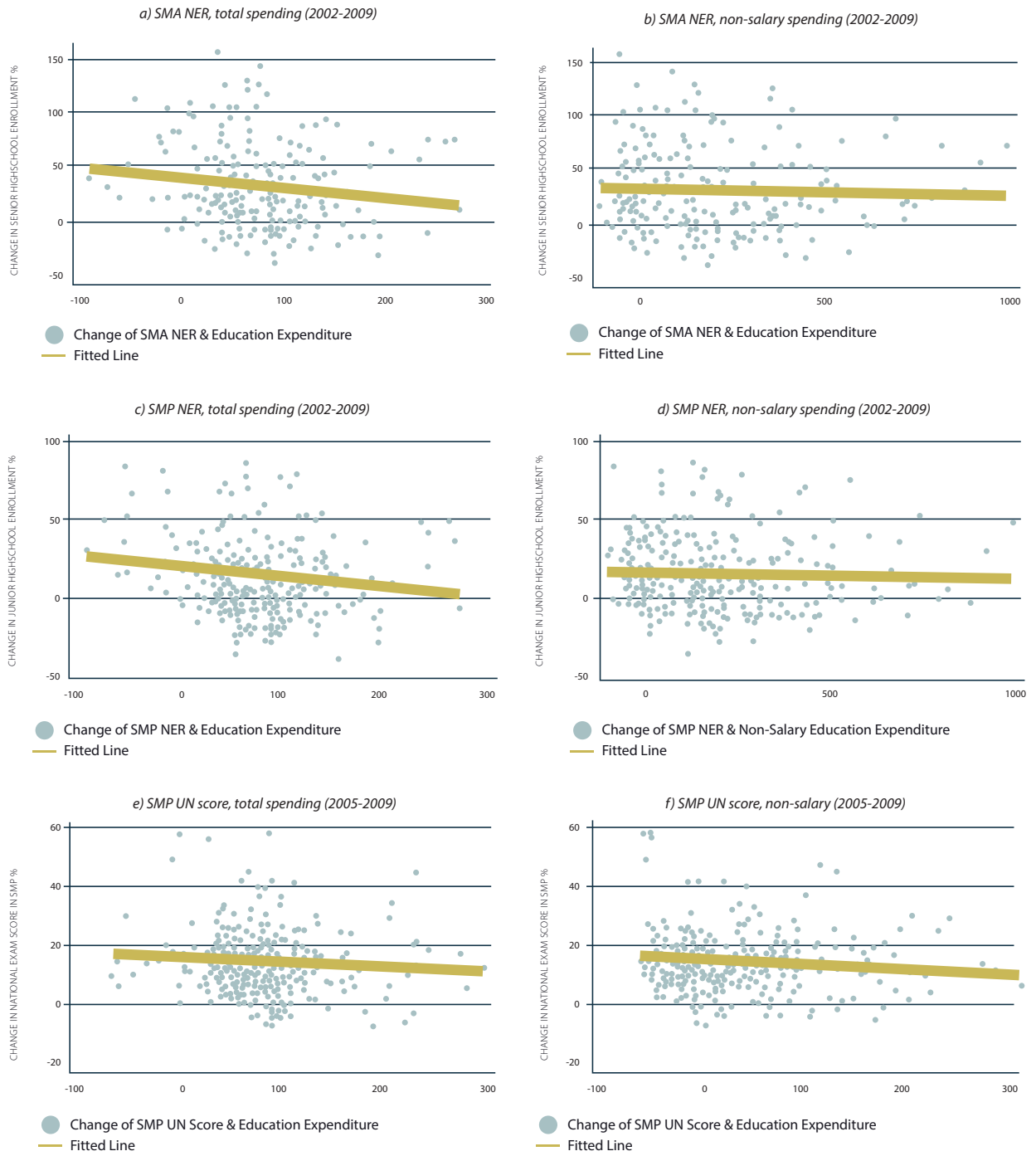
Source: MoF SIKD (budget), Susenas (NER) and MoEC (UN exams)

Madagascar PER (2015)

Overall comment:

This example shows a method for judging the efficiency of a country's public-education expenditures relative to its outcomes. It compares the expenditure-outcome relationships for one country (Madagascar) with those for other countries. The methodology is that of regression analyses against other countries and time series, with the results displayed in four-quadrant graphs. The public expenditure review has an extensive methodological annex (Annex 3) that explicates the models and assumptions underlying the results presented in this example. Although the Annex is too long to be included here, interested users can activate the link to the review to read the full Annex.

Overall efficiency analyses are particularly helpful to benchmark the structural performance of the system in comparison to other countries (Box 5). The objective of this analysis is to establish a link between the level of public education expenditures and general education outcomes using information from a large set of countries of all income groups and regions. The methodology and motivation as well as limitations of the analysis in terms of the outcome indicators chosen are presented in Box 5. The structural analysis, which evaluates a long-run "Madagascar effect" based on estimation from an unbalanced panel of 144-176 countries over the period 1980-2012, is presented in Annex 3 along with details on the methodology and regression results for both structural and current efficiency analyses.

However, various limitations to the analysis impose caution when interpreting the results.
In order to grasp the overall picture and make policy recommendations regarding the size of public expenditure, one cannot look at results of the efficiency analysis in isolation of analyses of inequalities in terms of financial burdens and outcomes. In addition, because education outcomes are usually affected with substantial delays by changes in the learning and teaching environment, it is possible that the efficiency analysis does not capture accurately the capacity of the system to transmit competencies and knowledge to its pupils.

Box 5. Efficiency Analysis of Public Education Expenditure

Overall/system efficiency analysis is often presented comparing efficiency score estimated by Data Envelopment Analysis methods (DEA) to situate countries relative to an Efficiency Frontier (see Herrera and Pang (2005) for a review of the literature). It is, however, difficult to interpret DEA efficiency scores for countries with low levels of spending. In particular, a country can obtain a very high efficiency score despite very poor education outcomes. Keeping sight of where the country stands in terms of both levels of input and output while assessing efficiency is thus very useful. The methodology presented here uses the same data as for DEA but efficiency is assessed visually in two dimensions rather than using a summary indicator. One dimension is obtained using deviations from expected public expenditure and the other using deviations from expected education outcome. Expected outcomes

and expected expenditures take account of the country's income level (in PPP), its size, and effects of regional and income groupings for LDCs. The unexplained variation is used to determine relative efficiency.

Evaluating "structural" efficiency. Structural efficiency relates to the long-term standing of the country relative to others in terms of public expenditure performance. It is important to measure to establish some benchmark that can be used to interpret current efficiency, especially because these results depend on characteristics of the Madagascar's education system (such as the relative importance of the private sector). A measure of structural efficiency can be obtained using all time periods and countries for which data are available and exploiting the panel structure of the data. A random-effects regression separates the residual variance in two parts: one that is common to all countries and one that is country specific. The country specific residual variance or "random effect" can be used to measure the structural advantage/disadvantage of the country (the country's typical deviation from expected outcomes).

Evaluating changes in "current/conjectural" efficiency. Beyond looking at the general position of the country relative to others, it is important to gage how it has changed across two time periods. In this case, expectations are estimated for each time period averaging values over 2 or more years (dampening measurement errors) and running an Ordinary Least Square regression on the cross-section of countries for which data is available. Residuals are then calculated as the difference between observed and predicted values.

The choice of outcomes indicators. Different types of outcomes can be considered depending on whether efficiency is assessed over a long time period (structural efficiency), or using averages calculated over short time periods (current efficiency). In general, outcomes that are most contemporaneously related to current expenditures, sufficiently dependent on the overall situation in the country, and sufficiently available and comparable across countries are best suited to evaluate changes over time. Herrera and Pang (2005) use primary and secondary enrollment (gross and net), completion rates (first and second level), years in school, and learning scores. Based on data availability, the gross primary and secondary combined enrollment ratios, primary completion rates, and the youth literacy rate (only available 2000 and 2009) are used here. The youth literacy rate is most relevant to the structural analysis as it is less contemporaneously related to expenditure than the other two but is only sparsely available. Enrollment rates are somewhat problematic for Madagascar given the inaccuracy of population estimates. Combining primary and secondary rates dampens (but does not solve) the problem. Learning outcomes would have been a good indicator in the structural analysis to capture the quality dimension but are not sufficiently available (number of years) or comparable across countries. Unfortunately, this was the case for all other internationally comparable indicators of quality.

The choice of expenditure indicators. Government education expenditure data in percentage of GDP (or GNI) are widely available in the UNESCO Institute of Statistics' database for the period 1980-2012 (covering 177-211 countries, depending on the year). The indicator is comparable across countries and goes through country clearance procedures. The indicator includes all public expenditures externally or internally financed.

The four-quadrants graphical illustrations. Results can be plotted into a four quadrant graph where (0,0) is the point where both education outcome and expenditures are at levels predicted by the model. Deviations from expected education outcomes are represented vertically (y-axis) and deviations from expected expenditure horizontally (x-axis). For most education outcome indicators, higher is better, so a position in the NW quadrant is most efficient and a position to the SE is least efficient. The SW quadrant includes countries which underperform in terms of education outcomes but also have relatively low expenditures. They are called underachievers. Those in the NE quadrants are overachievers.

Why focus on government expenditure? Although outcomes are the combined result of public and private education, and all education expenditures are expected to have some effect on outcome, the present analysis only considers public expenditures. First, as discussed above, there are no reliable data on total expenditures in education and no data that are comparable across countries. Second, according to the evidence provided above, public education represents the bulk of education expenditures, and it is also closely connected to the private education system; third, the outcomes considered focus on primary and primary/secondary education, accounting for more than 80 percent of children under 14 years. Finally, and importantly, even if comparable data on private expenditure are available, the point here is to evaluate public expenditure needs on efficiency grounds. If a country can obtain better education outcome overall with less public expenditure because the private sector takes on a larger part of the burden, it is indeed an efficiency improvement in terms of public expenditure.

Structurally, Madagascar places in the group of the most efficient countries in terms of enrollment but as an underachiever in terms of completion (Figure 13). In other words, considering the full variation of expenditures and outcomes over 1980-2012, Madagascar tends to spend slightly less on education (in percent of GDP) than its level of income, size and geographical location would predict while it achieves average or better than expected outcomes in terms of enrollment (primary and secondary combined) and youth literacy. However, the result is different when looking at completion rates: Madagascar achieves slightly lower completion rates than the levels of expenditure would predict. These results are not to be interpreted as reflecting the current situation but need to be taken into consideration when interpreting the results presented below. These results are not to be interpreted as reflecting the current situation but need to be taken into consideration when interpreting the results presented below.

Overall, the system demonstrated some resilience to the severe cuts in public funding during the crisis and remains broadly efficient compared to other countries. The analysis shows a slight increase in efficiency during the period 2009-2012 compared to 2000-2008 in terms of completion rates (Figure 14). In other words, the decrease in completion was less than what could have been predicted given the simultaneous decreased in spending. However, it is likely that the delayed effect on completion explains part of this result. On the other hand, the analysis shows that although the country's advantage in terms of GERs was reduced, it remains well above expectation. This may indicate a certain degree of resilience of the system, likely to be related to the rapid increased in private spending to compensate the cuts in public spending. In addition, it is important to note that this analysis does not fully take into account the potential loss in terms of education quality which would be measured through learning outcomes.[a]

Overall, the above analysis shows the relatively good structural performance of the system, but hides important weaknesses, including in terms of learning outcomes. Madagascar has a

high potential in education as it has managed to achieve better or similar outcomes than comparable countries with lower expenditures. So far, the crisis does not appear to have had a significant impact on efficiency if 2009-2012 averages are considered. This would seem to indicate that there some room to increase public expenditure on education without moving to a situation of overspending relative to other countries. Important caveats include however (a) it is likely that the full impact of the recent years is not fully captured, especially on indicators which react with a delay (such as completion rates), (b) the efficiency of the system is so far analyzed through the lenses of enrollments and completion, ignoring therefore changes in the equality of education. Given the dramatic decrease in education learning outcomes over the past decade, it is probably the case that although Madagascar is relatively more efficient than others at getting children to school, it is performing particularly poorly in terms of ensuring that resources are translated into improved learning outcomes.

Figure 13: Expenditure performance of public education: pre/post-crisis efficiency based on completion rates

Overall Efficiency of Public Spending in Education based on averages 2009-2012*
Indicator: Primary Completion Rates
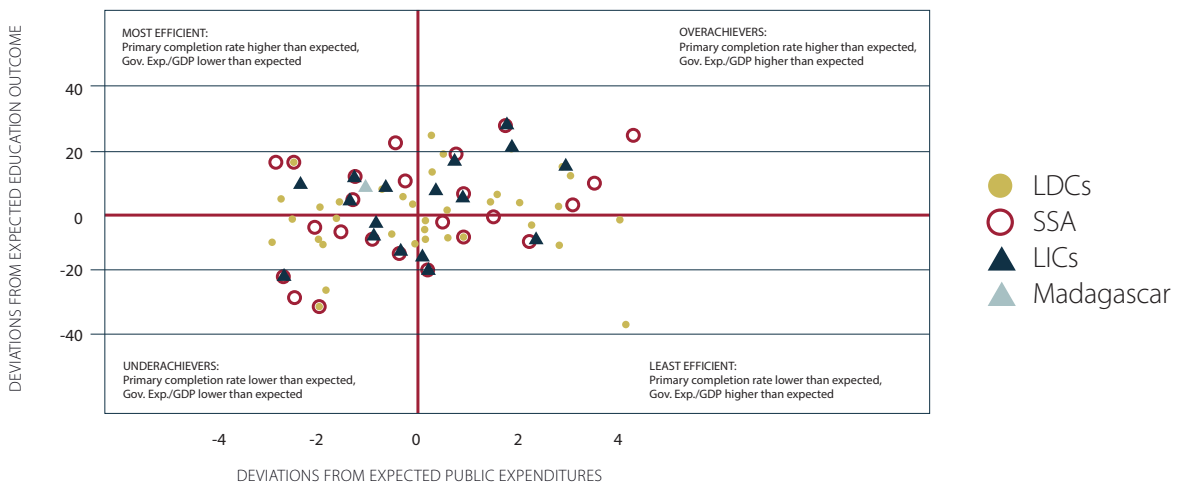
* Predicted values based on OLS regressions on GDP/c, GDP/c^2 with group effects for income and region (LDCs), population and size GDP in PPP per capita for all regressions.
Data Sources: World Bank Edstats based on UNESCO statistics for education variables, including expenditures, IMF data for income variables.

Overall Efficiency of Public Spending in Education based on averages 2000-2008*
Indicator: Primary Completion Rates
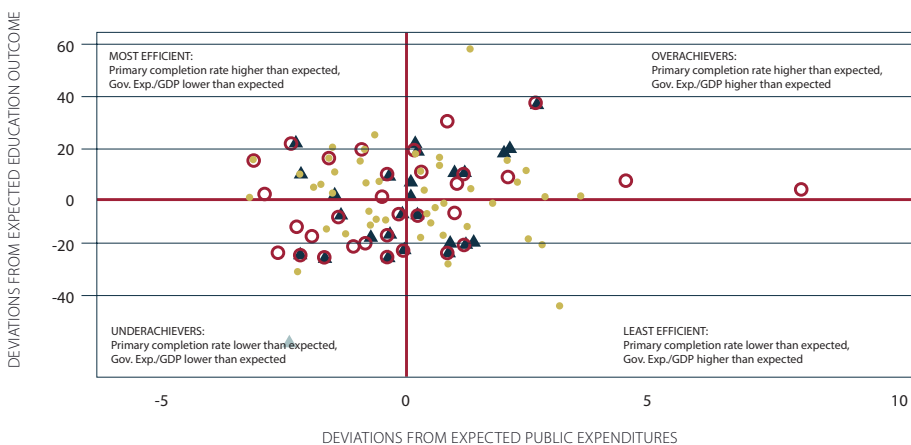
Figure 14: Expenditure performance of public education: pre- vs post-crisis efficiency based on gross enrollment ratios (primary/secondary combined)

Overall Efficiency of Public Spending in Education based on averages 2000-2008*
Indicator: Gross Primary & Secondary Enrollment Combined Rate**
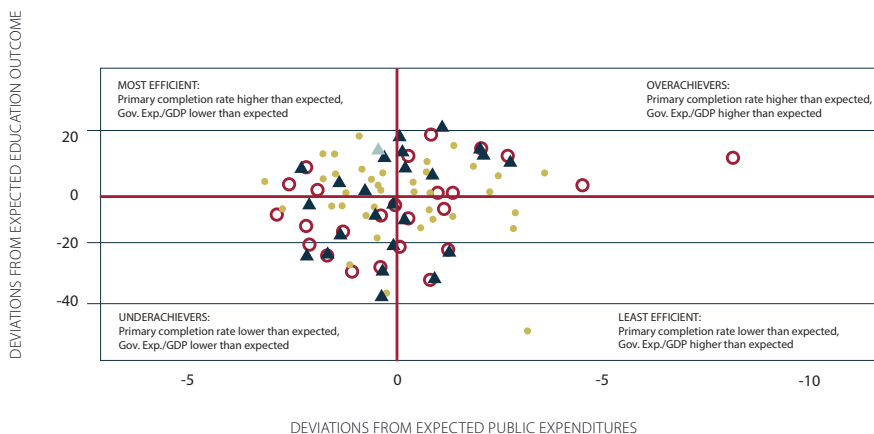
* Predicted values based on OLS regressions on GDP/c, GDP/c^2 with group effects for income and region (LDCs), population and size GDP in PPP per capita for all regressions.
** Gross enrollment rates for Madagascar: 2005-2008 average
Data sources: World Bank Edstats based on UNESCO statistics for education variables, including expenditures, IMF data for income variables.

- LDCs
- SSA
- LICs
- Madagascar

Overall Efficiency of Public Spending in Education based on averages 2009-2012*
Indicator: Gross Primary & Secondary Enrollment Combined Rate**
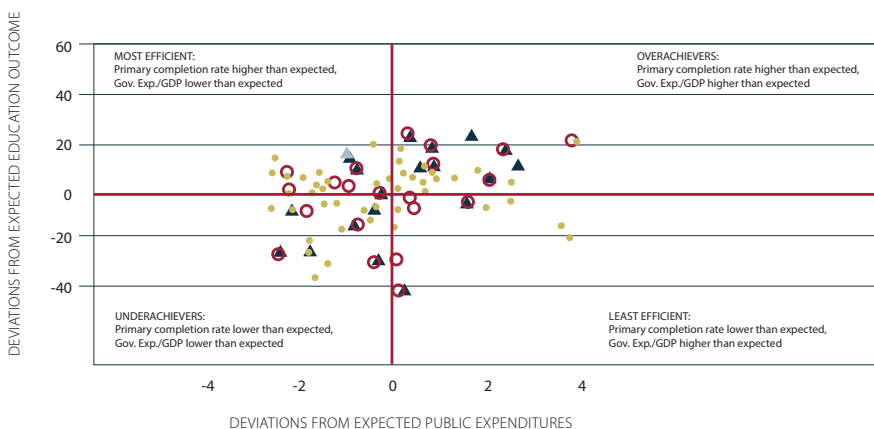
* Predicted values based on OLS regressions on GDP/c, GDP/c^2 with group effects for income and region (LDCs), population and size GDP in PPP per capita for all regressions.
Data sources: World Bank Edstats based on UNESCO statistics for education variables, including expenditures, IMF data for income variables.

[a] The full set of results is presented in Annex 3.

⬭ Example 23: Cost-benefit analysis

Ethiopia: Cost-benefit analysis on a project component (2008)

Overall comment:

This is a good example of a cost-benefit analysis of alternative materials that can be used to construct classrooms. It includes an analysis of the rates of return to the savings associated with different options relative to the base case of chika, a building material made of mud and thatch, and a comparison of the present values for two options relative to their discount rates. Note that the example is not from a public expenditure review, but from a policy research working paper (Jimenez and Patrinos 2008)

Tables 1-3 and figure 1 illustrate a cost-benefit analysis. They involve the choice of the construction material for building new classrooms in Ethiopia. Table 1 lays out the alternative materials considered, with their advantages and disadvantages. Table 2 calculates the relative costs per lifetime year for each option. Table 3 calculates the rates of return on the savings from alternative materials relative to the base case of chika (mud and thatch) under different assumptions. Figure 1 shows the present value of chika versus hollow core block (HCB), assuming half maintenance costs and plotted against the associated discount rate.

On the basis of tables 2 and 3, HCB emerges as the cheapest material per year of its lifetime and with the highest rates of return on savings under different assumptions. However, figure 1 shows that there is a discount rate at which building chika schools is preferable to HCB. The crossover discount rate is 23 percent in the case highlighted.

What is interesting here is how benefits are treated. The benefit is implicitly assumed to be school seats resulting from the construction. De facto, this benefit is assumed to be constant across the materials options. Since benefits are assumed to be constant regardless of the material selected, the analysis becomes one of relative costs of the materials under different assumptions.
Only a few advantages or disadvantages displayed in table 1 are independent of the relative costs (initial and recurrent or maintenance costs), which are properly captured in table 2. These "independent" variables include the popularity of the different materials within the community, the comfort that the material offers students and teachers in the classroom and environmental degradation (de-forestation). These variables could have been converted to categorical variables, weighted or unweighted, to measure the relative benefits of the different materials. For example, chika and corrugated iron sheets were unpopular materials with parents and students. The analysis could have argued that using either of these materials to construct new classrooms would prompt parents to be less likely to enroll their children in schools that were built of these materials, thus reducing their school seat benefits. The analysis did not use this option.

Table 1: Relative advantages and disadvantages of alternative construction materials (Ethiopia)

Material	Advantages	Disadvantages	Maintenance
Chika (mud and thatch)	Cool in dry and hot weather Cheap initial investment	Does not resist termites Washes away in rain Depletes forest Not popular with community, students	High
Concrete element	Resists termites and rain	Costly initial investment	Low
Stone	Resist fire, termites, rain	Costly initial investment	Low
Hollow concrete block (HCB)	Resist fire, termites, rain Better insulation	Need stable foundation, supervision	Low
Brick	Comfortable and cool	Many trees cut to burn brick Weak in rainy season	High
Corrugated iron sheets	Cheap initial investment	Susceptible to corrosion Not heat resistant Not popular with community or students	High

Source: Harry Patrinos

Table 2: Cost comparison of school buildings, 1992 Ethiopia Birr*

Material	Capital (Investment)	Recurrent (Maintenance)	Lifetime* (Years)	Cost/Year Lifetime
Concrete element	213,000	2,130	40	7,455
Stone	189,284	1,893	40	6,625
Brick	170,400	5,000	30	10,680
Hollow Concrete Block	127,800	1,278	30	5,538
Chika	85,200	6,000	10	14,520
Corrugated Iron Sheet	31,950	5,000	10	8,195

* With full maintenance
Source: Participatory Evaluation of EICMA (Educational Institutes Construction and Maintenance Agency). A report to Ministry of Education and SIDA. 1992.
Source: Jimenez and Patrinos, table 4, p.31.

Table 3 includes the results of sensitivity analyses. Thus, school buildings are not well maintained in Ethiopia, and the assumption of full maintenance is not realistic. For this reason, a sensitivity analysis considers the more realistic case that maintenance will be less than adequate. For simplicity's sake, half of the required maintenance is assumed to take place. The choice of technology also depends on the availability of local materials. It may simply not be possible to transport certain materials to remote areas. For many rural areas there will be impossible transportation problems. In such cases

there is no alternative other than building with chika. In less severe cases there may be roads, but the cost of transporting materials may be prohibitive. To examine this problem, sensitivity analysis was carried assuming scenarios of cost escalation due to transportation difficulties using orders of magnitude of 10 to 30 percent.

Table 3: Rates of return on savings due to selection of different school building materials versus chika (Ethiopia)

Material	Full Maintenance	Half Maintenance	Transportation Difficulties: Cost Escalation		
			10%	20%	30%
Concrete element	6%	9%	7%	5%	2%
Stone	8%	11%	9%	6%	3%
Brick	5%	11%	9%	6%	2%
Hollow Concrete Block	17%	23%	19%	13%	8%
Chika	(base camp)	(base camp)	(base)	(base)	(base)

Source: Jimenez and Patrinos, table 5, p.32

Figure 1 shows that even in the case of hollow concrete block, there are instances when it is not a good investment. All of the alternatives to chika have a lower present value. However, the total undiscounted cost of using the different alternatives is different, and they have differing time profiles. Therefore, the alternative one chooses may depend on the opportunity cost of capital.

Figure 1: Present value of chika versus hollow core block relative to discount rate

Graphic Derivation of Crossover Discout Rate, Choice Between Chika and Hollow Concrete Block Alternatives in Ethiopia
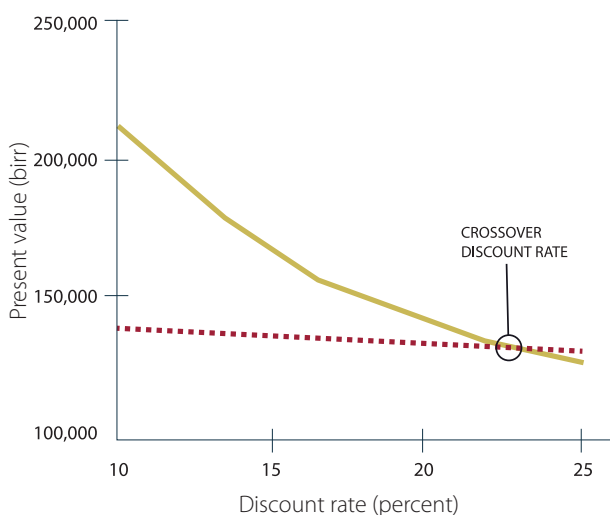
Source: Jimenez and Patrinos, figure 4, p.34

In the cases examined here, the higher the opportunity cost of capital assumed the greater the likelihood of choosing chika over the alternative. This is because with the chika model one is postponing investment. In other words, there is a discount rate at which chika becomes the preferred option, despite higher undiscounted total cost or lower present value of the alternatives. To illustrate this example, the case of chika versus HCB is used. The present value of the two methods, assuming half maintenance costs, is plotted against the associated discount rate. The graph shows that there is a discount rate at which building chika schools is preferred to HCB. This is known as the crossover discount rate, which is 23 percent in the case highlighted. This is the same as the internal rate of return calculated for the benefits (cost-savings) stream presented above for the case of half-maintenance, which is probably the more realistic scenario.

⬤ Example 24: Data envelopment analysis

Overall comment:

The Kenya and Democratic Republic of the Congo (DRC) reviews have examples of data envelopment analysis at the subnational level. The Kenya example is a simple analysis based on one input (per capita spending) and one output (net enrollment rate or percentage of exam passes), while the DRC analysis conducts an analysis based on composite input and output variables. The DRC analysis provides a brief methodological note and explains the difference between the input and output approach in such analysis. These two examples provide different ways of examining and presenting data envelopment analysis results, such as the efficiency frontier graph in the Kenya example and the efficiency score quadrants diagram in the DRC analysis.

Kenya PER (2013)

Data envelopment analysis (DEA) is a linear programming methodology (developed by Farrell's (1957), which can be used to estimate efficiency as the distance from the observed input-output combinations to an **efficiency frontier** defined as the maximum attainable output for a given input level.

Per capita spending in Kenya tends to be low for northern and coastal counties with higher pupil teacher ratio (PTR), implying a shortage of teachers in these regions. Counties in these areas also tend to have lower net enrolment rates. But several counties, such as Turkana and West Pokot, report remarkable performance in exams, placing them on the frontier of translating per capita spending into exam performance measured in terms of the percentage of children passing the Kenya Certificate of Primary Education (KCPE) (Figures 1 and 2).

The per capita spending in secondary level shows the reverse: unit costs are higher in the more remote areas in the northern and coastal regions. This fact is explained by the much lower enrolment rates in these regions and lower pupil-teacher ratio. The counties in these regions also show the challenge of being efficient with the resources. These counties are much more likely to be well below the frontier in terms of exam performance. Counties such as Kiambu, Nairobi and Nyeri where enrolments and school performance are relatively high are the most cost effective at this level. The counties far from the frontier at secondary level such as Garissa, Kwale, Laikipia and Nyamira are not cost effective (Figures 3 and 4).

Figure 1: Per capita spending and NER-primary, 2009
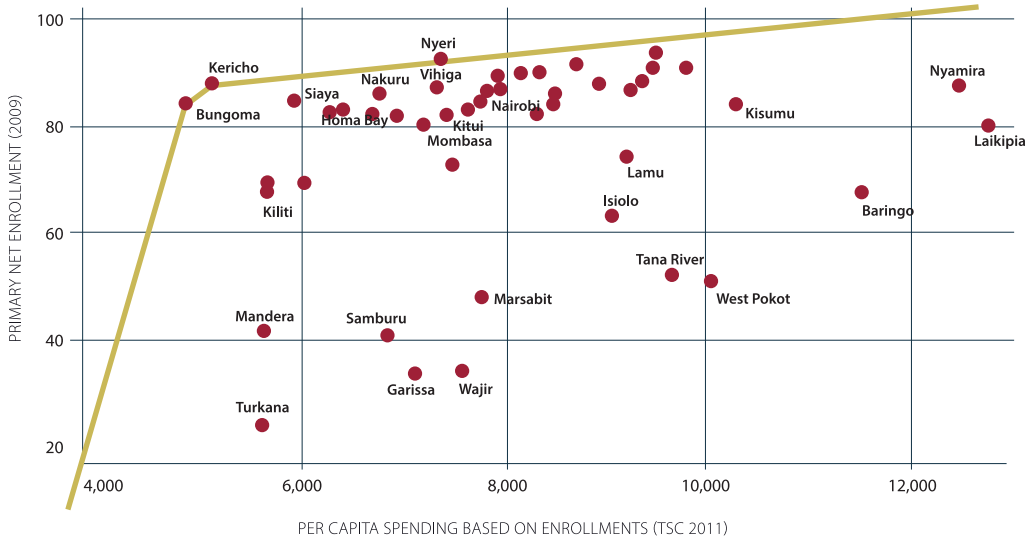
Source: Ministry of Education

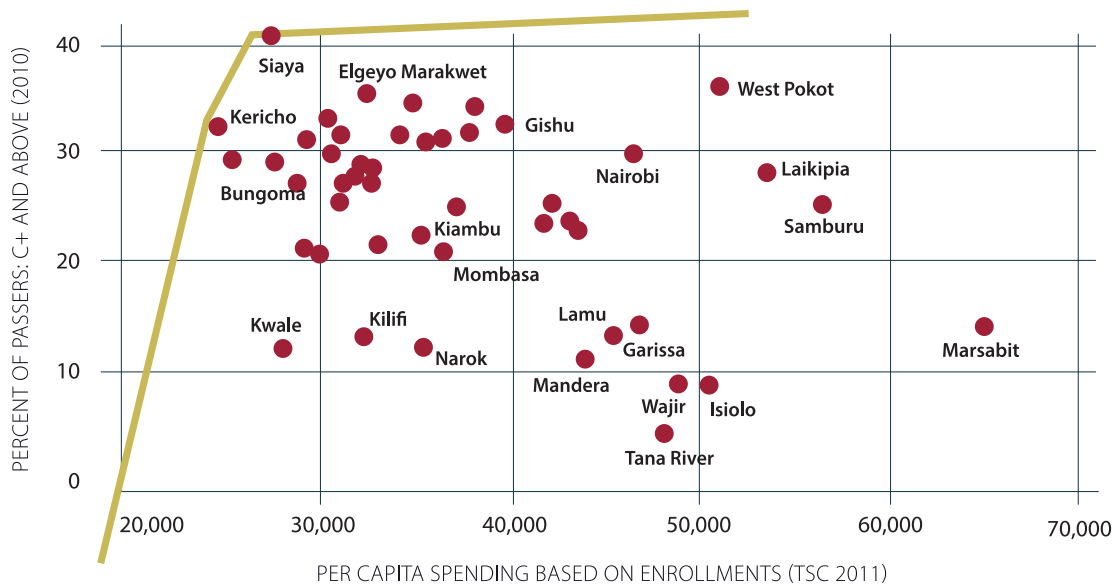## Figure 2: Per capita spending and percentage of exam passes, primary, 2010
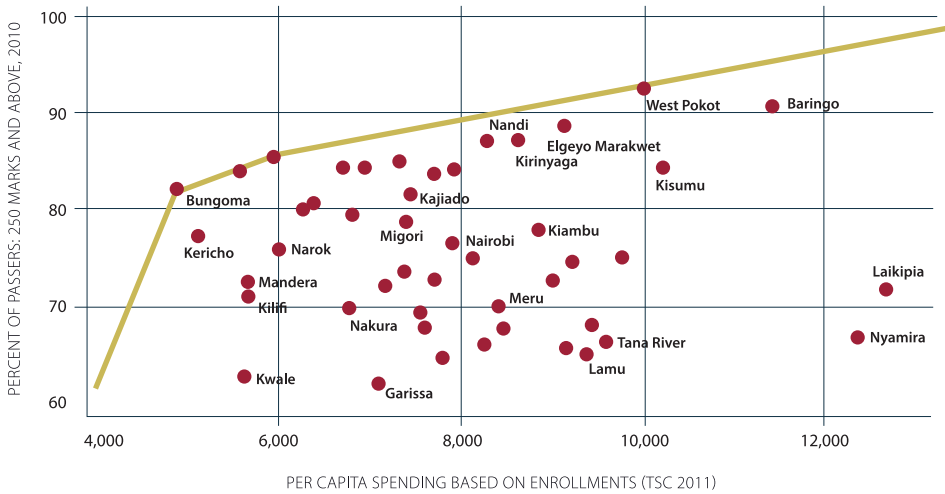
Source: Ministry of Education

Figure 3: Spending per capita and NER–secondary, 2009
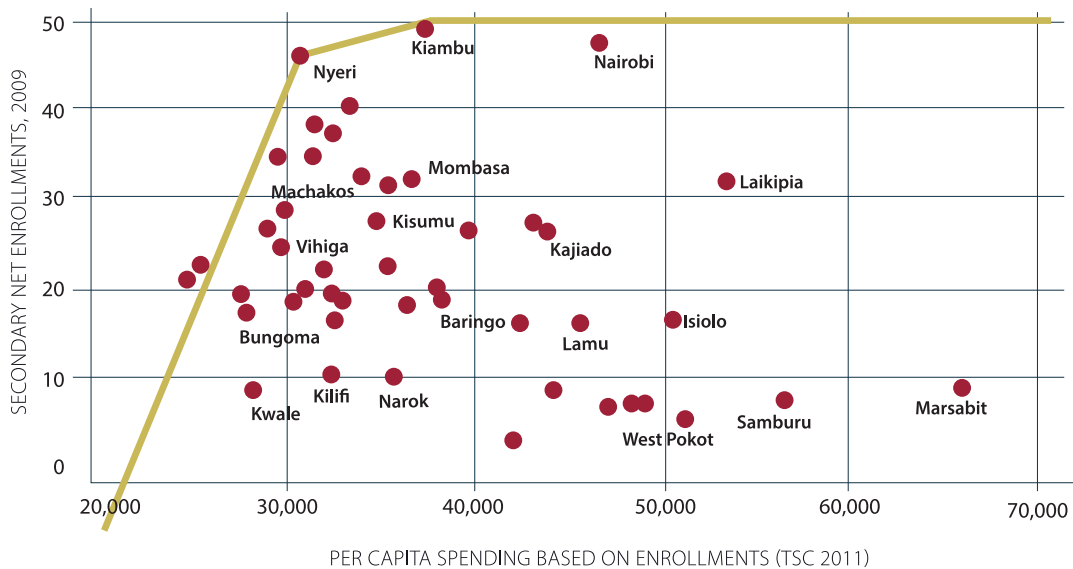
Source: Ministry of Education

## Figure 4: Spending per capita and percentage of passers at secondary level, 2012

Source: Ministry of Education

Democratic Republic of Congo PER (2015)

Efficiency measurement with DEA

Data Envelopment Analysis (DEA) is based on the construction of an empirical non-parametric production frontier and the measurement of the efficiency through the distance between the observed data and the optimal value of these data given by the estimated frontier. In the current analysis, the production frontier approximates the maximum quality or access to education (the output) that could be achieved given different levels of educational resources (the inputs). The figure below illustrates the efficiency measurement with DEA in a hypothetical case of one input x that is used to produce one output y.

Illustration of the efficiency measurement with DEA
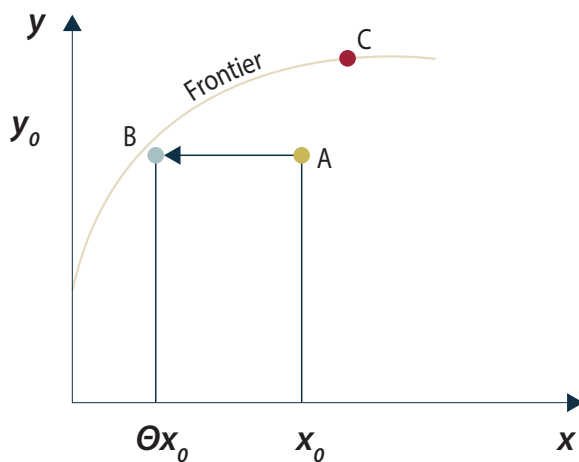
The frontier gives maximum levels of the output that could be achieved given different quantities of the input used. In the DEA literature, observations are called Decision Making Units (DMUs). DMUs that are on the frontier are relatively efficient (for instance, DMU at the point C) while those below the frontier are relatively inefficient (for instance, DMU at the point A). The level of efficiency is given by the distance to the frontier. Let's consider the DMU0 initially at the point A. This DMU uses x0 units of the input in order to produce y0 units of the output. As already mentioned, DMU0 is not relatively efficient. In order to be efficient, this DMU can reduce its input in the way that it projects on the frontier at the point B. In other terms, in order to be efficient, this DMU can keep its output level unchanged but has to reduce its input to the optimal level. The optimal quantity of input is given by with. The higher is, the closer the DMU is to the frontier and the more efficient is the considered DMU. The value of is the efficiency measure. This approach is called input oriented DEA. There is an alternative to the input oriented DEA (the output oriented DEA) which is about how to get the frontier by increasing the output given the input used. While there are also several DEA models, the model that we use is the one developed by Charnes, Cooper, and Rhodes (1981).

Efficiency measurement of the DRC education system

In this study, we use input oriented approach because we would like to focus on the use of resources in the DRC education system. One can notice the high heterogeneity in terms of access and quality of education across DRC provinces. Provinces that seem to perform well in terms of access do not necessarily do so in terms of the quality of education. For this reason, we perform two different efficiency analysis, one for the access to education and the other for the quality of education.

Efficiency in the provision of education access

Recall that the illustration done above is a hypothetical case with only one output and one input[a]. In order to estimate a DEA model for the DRC, we need to choose inputs and outputs. In fact, DRC education system uses many inputs in order to provide the observed access to education. In addition there are several indicators of education access. More specifically, in the inputs side, we need to have proxies for educational infrastructure, equipment, human resources and public expenditures[b]. In the current efficiency analysis, we use the total number of schools and classrooms per student as proxies for infrastructure, the total number of equipment materials (chairs, tables and other types of equipment) as a proxy of school equipment, the number of teachers per student as a proxy for human resources and government total spending per student as a proxy for government expenditures. The outputs are: the gross enrollment rate, the gender parity ratio, the pass rate at grade 6 and the repetition rate.

As already discussed, according to the administrative organization, the DRC includes eleven provinces and each province is divided into districts. Inside the administrative districts, primary and secondary schools are differently managed. For this reason, we distinguished between primary and secondary schools inside each district. We aggregated schools by levels of education and we considered districts as DMUs depending on the level of education[c]. In other terms, a DMU represents either all primary schools or all secondary schools in a given district. For instance, in the district of Beni, we have two DMUs, one for primary schools and the other for secondary schools. This approach is advantageous because it allows comparing primary and secondary schools within the same district and across districts. We have one frontier for primary and secondary schools and this provides a proper comparison. Due to the lack of data in several districts, we only consider 82 DMUs and 42 districts.
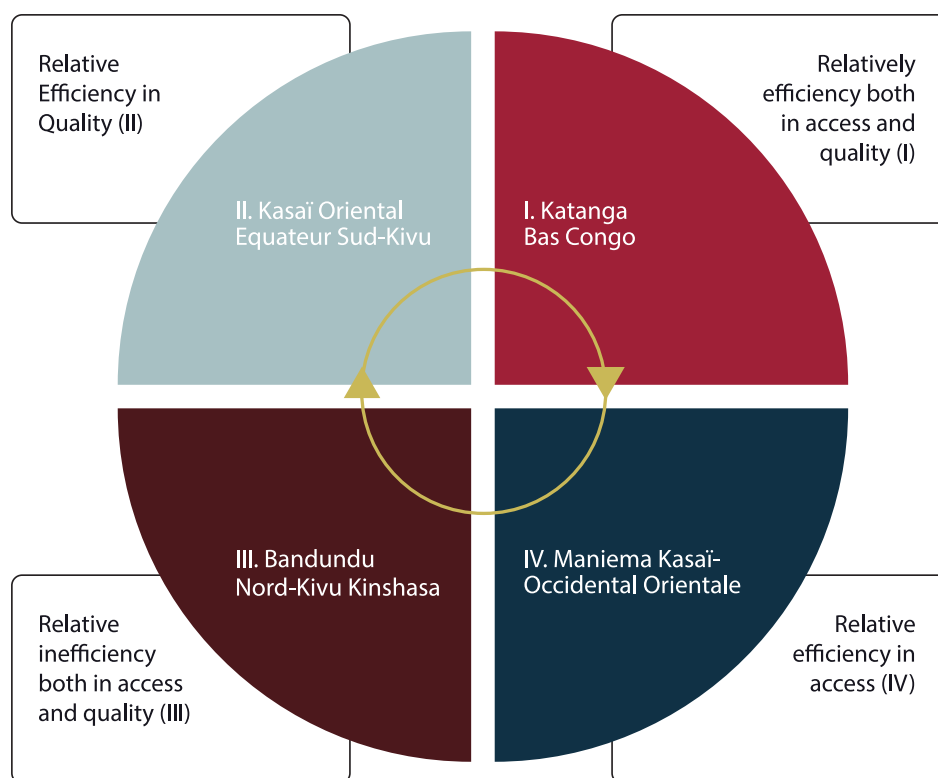
Efficiency in the provision of the quality of education

A DEA model is estimated using PASEC 2013 survey data in order to measure the efficiency in the provision of quality education in the DRC primary education system. Some key variables necessary for this analysis are not available for secondary education. For this reason, we concentrate on primary education. Inputs include the number of teachers per student, the number of classrooms per student, teachers' level of education, teachers' monthly salary and schools' equipment. Outputs are: the success rate, average score in the PASEC French and mathematics tests. We have a total 160 schools.

The overall results of the DEA analysis at the provincial level shows that Katanga and Bas-Congo provinces are relatively efficient and Kinshasa, Bandundu and Nord-Kivu relatively inefficient in their resource use. Figure 49 presents the summary of DEA results in four quadrants (I, II, III and IV). The

first quadrant (I), refers to provinces with relatively high efficiency scores both in terms of access and quality related variables (learning outcomes). Quadrant (II), designates provinces with a relatively high efficiency score in quality. This group of provinces are basically in line with first quadrant (I) in terms of learning outcomes efficiency score but have lower efficiency scores in access outcomes compared to quadrant (I). Quadrant (III) shows provinces with relatively lower scores in both access and quality outcomes efficiency scores. The final quadrant (IV), shows provinces with relatively better efficiency scores in the access model (in line with the first quadrant (I) in this aspect) but lower efficiency scores in learning outcomes.

Figure 49: Summary of provincial grouping based efficiency scores based on DEA model

Relative Efficiency in Quality (II)

Relatively efficiency both in access and quality (I)

II. Kasaï Oriental Equateur Sud-Kivu

I. Katanga Bas Congo

III. Bandundu Nord-Kivu Kinshasa

IV. Maniema Kasaï- Occidental Orientale

Relative inefficiency both in access and quality (III)

Relative efficiency in access (IV)

Source: Authors' estimations based on Ministry of Budget, EMIS, SECOPE, HBS 1-2-3, 2012, and PASEC

[a] DEA accommodates multi input and multi output technologies. The principle is the same when we have more than one input and more than one output but it is difficult to be graphically illustrated. In addition, it is important to highlight that the efficiency assessment is done in a relative terms and results could change when the sample changes.

[b] The choice of inputs and outputs is supported by the literature. In fact, similar choice of inputs are done by authors in studies on the efficiency analysis in education. Other authors provide discussion about possible inputs and output for the education system. See for instance, Correa (1963), Burkhead (1967), Michaud (1981), Charnes, Cooper, and Rhodes (1981) and Worthington (2001).

[c] It should have been more appropriate to consider educational provinces as DMUs instead of districts given the fact that districts are linked to the country's administrative organization rather than the organization in the education system. However, we could not have performed this analysis with the only educational provinces because DEA requires a certain number of observations for the results to be reliable.

⬤ Example 25: Internal efficiency indicators

Bangladesh PER (2010)

Overall comment:

An internal efficiency analysis based on survival, repetition, and completion rate indicators reveals inefficiency problems in the education system in Bangladesh.

The education system in Bangladesh is characterized by persistent low quality and inefficiency. Only half of all children beginning primary and secondary education survive up to the final grade. At the secondary level only one in five actually passed the SSC examination (Table 3.2). Failure to complete secondary education is a growing phenomenon. Between 2000 and 2005, the proportion of the 16-25 age group with an incomplete secondary education as their highest educational attainment increased from 23 to 33 percent (Al-Samarrai 2007a).

Table 3-2: Internal efficiency (%) of the education system (2005)

Sector	Repetition Rate			Survival Rate			Completion Rate		
	M	F	T	M	F	T	M	F	T
Primary	12	11	11	49	57	53	-	-	-
Secondary (general)	8	8	8	43	40	41	23	17	20
Secondary (*madrassa*)	-	-	-	-	57	61	-	14	22
Higher secondary	-	-	-	-	-	-	-	59	57

Source: (DPE 2006a; BANBEIS 2007).
Notes: Primary statistics cover government, registered non-government and experimental schools. Statistics for madrassa education are for 2003. Figures for survival and completion rates are calculated using the reconstructed cohort method.

⬤ Example 26: Rate of returns to education

Sri Lanka PER (2011)

Overall comment:

This review presents considerable differences in the rates of return to education by level of education. Interestingly, the impact of education on earnings is higher for females at all levels except for those who only completed primary education.

Education attainment and earnings are positively related in Sri Lanka. Earnings rise continually as the education levels of individuals increase [Figure 2.1]. A male worker with primary education earns 16 percent more per month than a man with no schooling, and a female worker with primary education earns 8 percent per month more than a woman with no schooling. Among men and women who have completed basic education, a male worker earns 43 percent more than a man with no education, and a female worker earns 45 percent more than a woman who is not educated. The highest gains are recorded among men and women who have completed higher education. Overall, these findings clearly support the notion that men and women benefit from their investments in education.

Figure 2.1: Impact of education on earnings, male and female workers, 2008
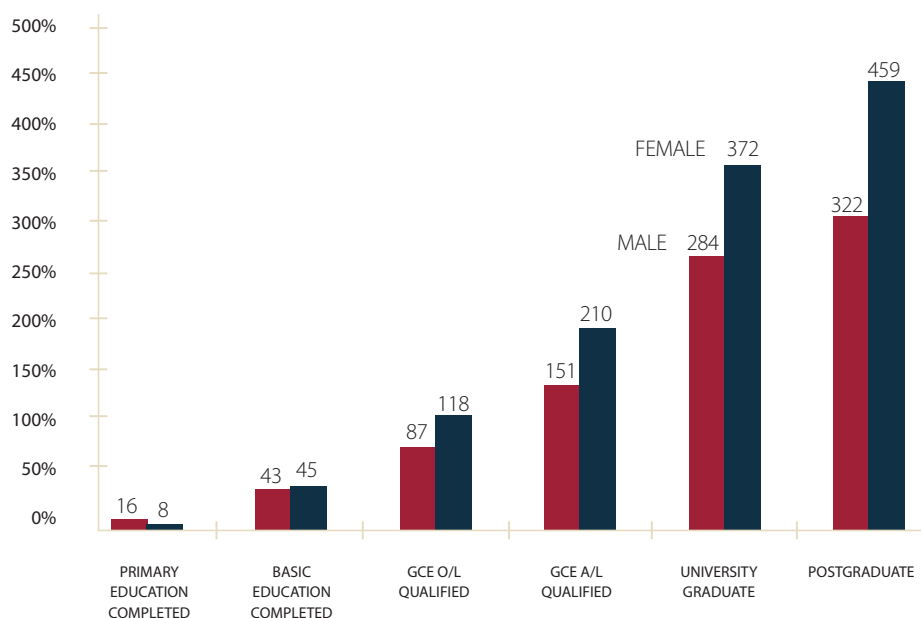
Source: World Bank staff computations, derived from econometric estimates of earnings functions.

The rates of return to education are positive and substantial at the secondary and higher education levels. Among primary educated workers the returns to education are positive but relatively low, at 2 percent for men and 1 percent for women, respectively [Figure 2.2]. Workers who have completed basic education receive slightly better returns: 7 percent for men and 10 percent for women. However, among workers who are secondary educated or higher, returns to education are considerably greater. GCE O/L qualified men earn returns of 13 percent, while women enjoy even higher returns at 21 percent. Among GCE A/L qualified workers, men receive a return of 15 percent, while women receive a return of 18 percent. Among university graduates the returns to education for both men and women are 21 percent. At postgraduate level, the returns to education for men are 9 percent and for women 17 percent, respectively.

Figure 2.2: Private rates of return to education, male and female workers
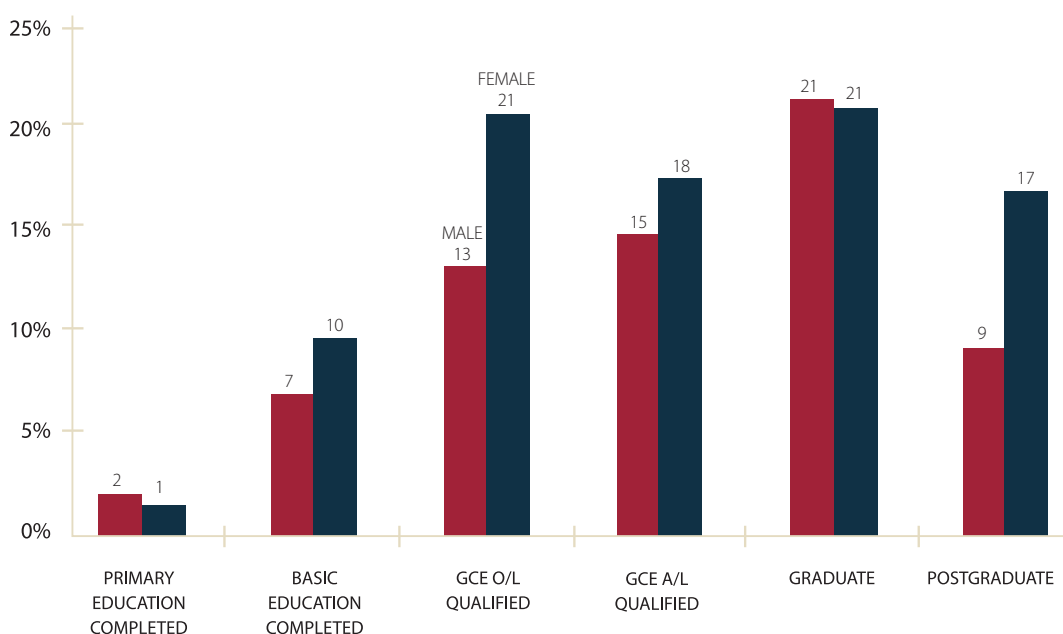
Source: World Bank staff computations, derived from econometric estimates of earnings functions.

This pattern of returns to education is consistent with the fact that the supply of primary and basic educated human capital is relatively high, so that returns to education at this level are small. At secondary education level and higher education level, however, the supply of educated labor is lower, and returns to education are high. In addition, workers may be using their educational certificates at secondary education and higher education levels to signal their quality, while employers may be using these certificates to screen potential employees for quality. Overall, the pattern of returns to education is consistent with economic theories of human capital and of signaling–screening in labor markets with asymmetric information. The higher returns enjoyed by women in comparison to men is likely to be due to selection effects, as fewer women participate in the labor market. Therefore, the women who do work are likely to be more capable than average, resulting in better productivity and greater returns to human capital.

⬤ **Example 27: Analysis of inequity**

Costa Rica PER (2015)

Overall comment:

A simple analysis of learning outcomes, enrollment rates, and rates of preschool attendance reveals large regional differences and differences associated with socioeconomic status, indicating an inequity problem exists in Costa Rica's education sector.

In Costa Rica, urban and rural areas of the country present large disparities in enrollment in secondary and upper-secondary. While almost 60% of the 19 year old living in urban areas living are enrolled in school, less than 50% of those living in rural areas do so (Figure 21).

Equally worrying, the disparities in post-secondary enrollment associated with household income have been dramatically increasing over time (Figure 22).

Figure 21: Age specific enrollment by geographic area
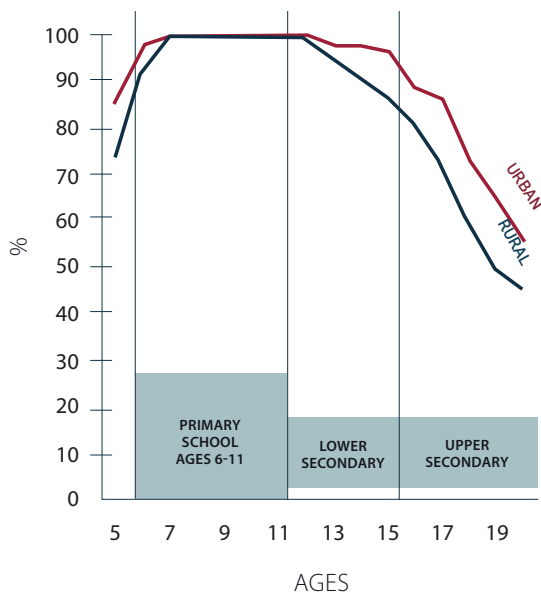
Source: World Bank SSEIR team's analysis of household surveys, author's calculations based on ADePT software

Figure 22: Post-secondary enrollment by income quintile
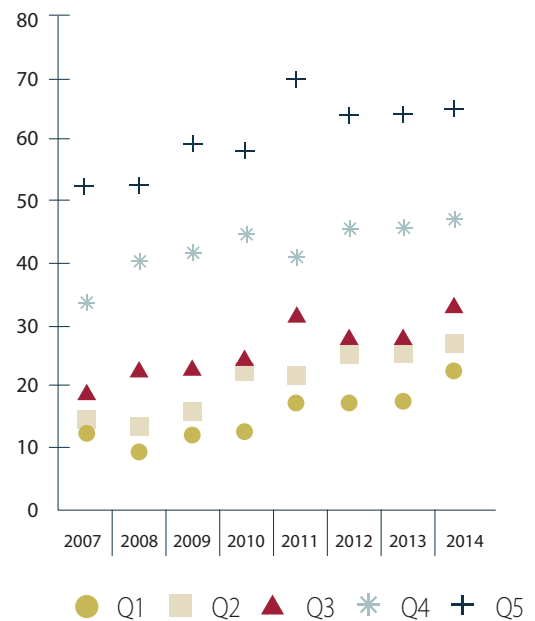
Source: World Bank SSEIR team's analysis of household surveys, author's calculations based on ADePT software

Moreover, the latest results from the Third Regional Comparative and Explanatory Study (TERCE) 2013 examination of Latin American students by UNESCO show that Costa Rica is the only country in the region where students in both 3rd and 6th grades performed worse in TERCE 2013 than they did in Second Regional Comparative and Explanatory Study (SERCE) 2006 in reading and in mathematics. Consistent with the findings for enrollment, there are large differences in learning outcomes associated with socioeconomic status. Data from the SERCE 2006 show that one standard deviation (sd) increase in a socioeconomic conditions index are associated with a 0.3sd increase in test scores (Figure 24).

Figure 24: SERCE standardized score by socioeconomic status index
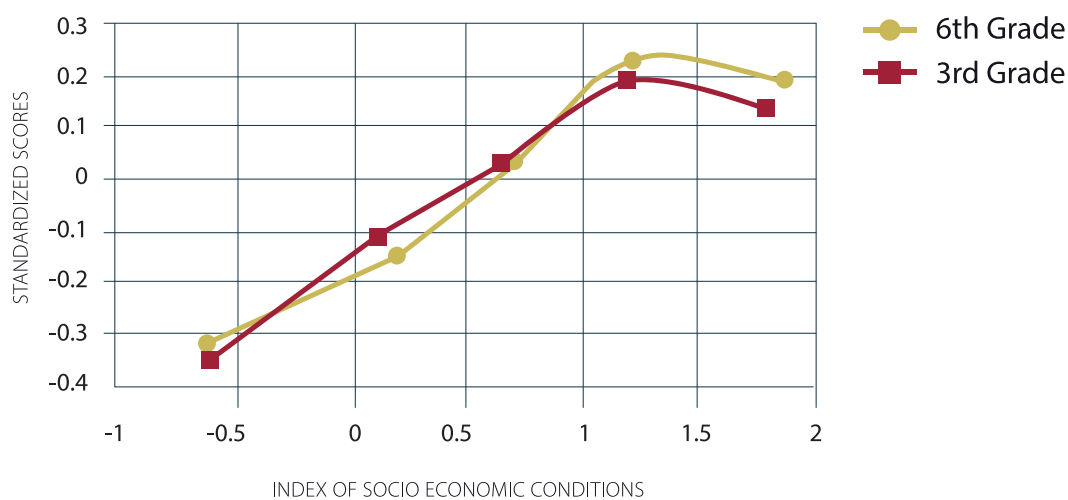
Source: SERCE (2006)

The drivers behind the large inequalities include gaps in the access to education services that start early in life. There is well established evidence that high quality Early Child Development programs act as equalizers, since they can reduce the effect of household socioeconomic differences on the child cognitive and non-cognitive development and, therefore, the ability to perform well in school. In Costa Rica, there is a large differential in daycare (age 1-3) and preschool (age 3-5) attendance by household income quintile. Only 3% of the children in the first quintile attend daycare, as opposed to 16% among those in the fifth quintile (Figure 27). Similarly, for children in preschool age, 27% of those in the first income quintile attend preschool, while attendance goes up to 49% for those in the top income quintile (Figure 28).

Figure 27: Daycare attendance by household income quintile, 2014
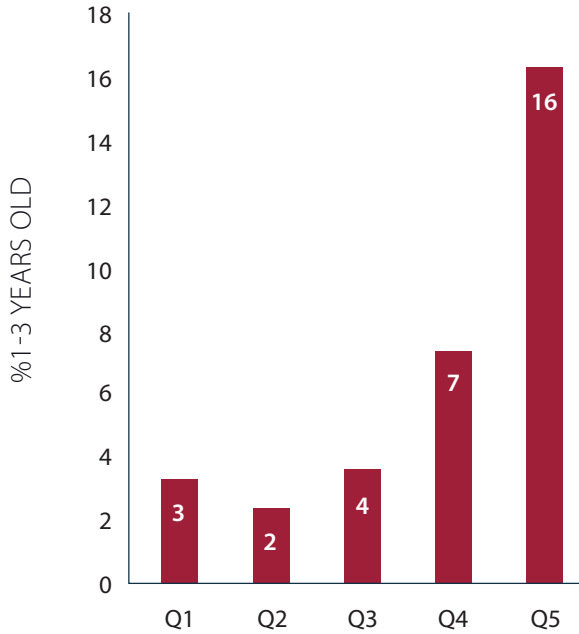
Source: World Bank SSEIR team's analysis of household surveys, authors' calculations using standardized ADePT software (Education Module)

Figure 28: Preschool attendance by household income quintile, 2014
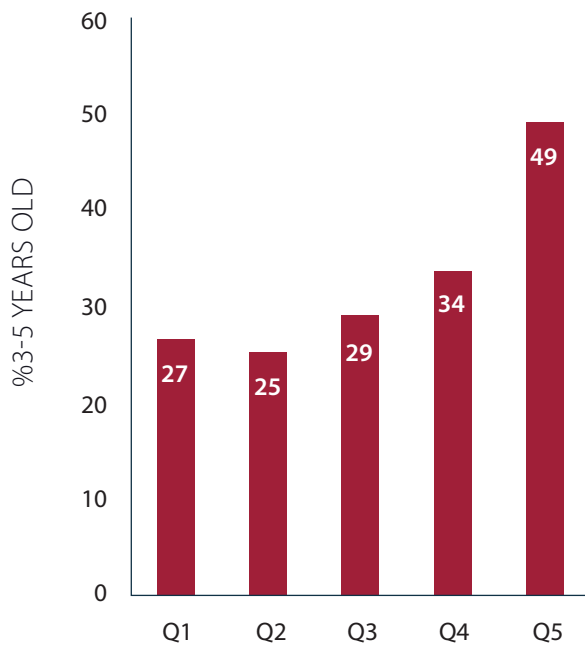
Source: World Bank SSEIR team's analysis of household surveys, authors' calculations using standardized ADePT software (Education Module)

⬭ **Example 28: Analysis of per capita financing (PCF)**

Tajikistan PER (2013)

Overall comment:

The report provides historical background on the reform of the country's per capita financing arrangements and the indicators used to measure their implementation. It also addresses factors that could undermine the sustainability of the reform.

History of Per Capita Financing (PCF) in Tajikistan

Since 2010, all general secondary schools receive their budgets according to a per capita financing (PCF) formula. In Tajikistan, PCF for general education was first piloted in five cities and rayons in 2005, with budget allocation primarily based on the number of students.[a] After successful implementation during the pilot phase, the PCF reform was gradually expanded and adopted nationwide— to all schools in 68 rayons—by 2010. The norms (unit costs) per student and per school have increased considerably over years (Figure 8), and the formula has been revised to better reflect the different needs of schools such as geographic location, type of schools, and multi-language requirements.

Figure 8: Minimum standards (norms) for per pupil and per school, 2008-2013

Per Student Norm, in TJS   *Per School Norm, in TJS*
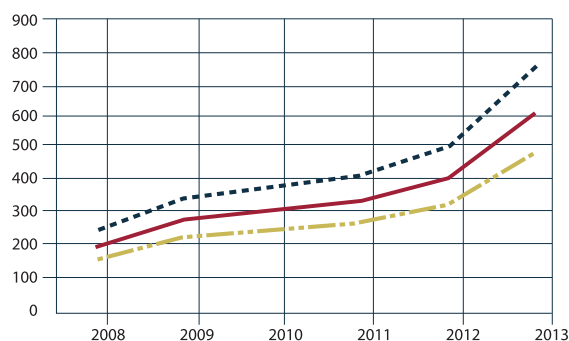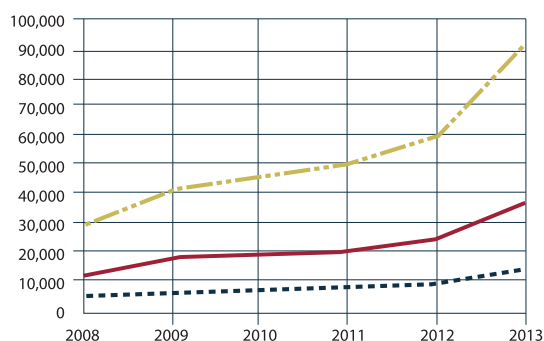
Legend: ▪▪▪ Primary   ▬ General   ▪▪▪ Secondary

Source: Ministry of Education

The introduction of PCF has considerably increased the role of schools and the central government in general education financing but it reduced the role of rayons. Schools prepare their budgets according to the norms and formula set by the Ministries of Finance and Education of the republican government. They then submit them to rayons, which in turn submit an aggregated education budget to their respective oblasts and finally to the Ministry of Finance of the republican government.[b] There remains a room for budget negotiations between the different levels of the government, and rayons may also allocate a significant portion of their local budget to education. However, the introduction of PCF has considerably reduced the role rayons in general education financing because the larger part of it is determined by the centrally defined formula. On the other hand, because the formula- based budget allocation cannot fully accommodate various factors and needs of schools under different conditions, the PCF model gives rayons the right to reallocate up to five percent of the formula-based allocations from schools with a surplus to those with a deficit. At the school level, schools may flexibly determine their budgets as long as they meet educational requirements and norms for wages.

Subnational Variation in Education Expenditure

Overall, the introduction of PCF has led to a more equitable distribution and efficient use of resources, increased budgetary autonomy at the school level, and greater transparency and community involvement in school planning and budgeting. Between 2007/2008 and 2011/2012, the nationwide student-teacher ratio increased from 17.0 to 18.0 on average. Over the same period, the share of personnel costs in local government education expenditures fell from 86.8 percent to 75.9 percent, freeing resources to improve the quality of education. In terms of equity, in 2010 only 82 percent of all general secondary schools had an approved budget in line with the formula-based budget, but in 2011 95 percent of schools had a PCF-compliant budget.[c] The switch to PCF provides greater budgetary autonomy for schools and gives them responsibility to manage resources effectively and efficiently, and work closely with communities to plan school development, formulate budgets and monitor expenditures. There has been regular monitoring and evaluation of reform implementation by the Ministry of Education.[d] The success of PCF in general education has encouraged the MOE to extend it to other levels of education.

A comparison of student-teacher ratios between oblasts and rayons illustrates wide regional variations in terms of efficiency outcomes. Between 2007/2008 and 2011/2012, the overall STR improved from 17.0 to 18.0 ranging from 5.7 in Roshtkalla rayon in GBAO to 25.0 in the city of Dushanbe in 2007/2008 and from 6.5 to 25.5, respectively, in 2011/2012. Between the maximum and minimum, there are wide variations within each oblast (though all data are not shown in the graphs), but not all oblasts and rayons observed the similar change (Figure 9). As a result, per student spending and the percentage distribution of recurrent spending widely vary between oblasts, but without a clear correlation (Figure 10). Part of these variations can be explained by conditions—elevation and population density—but there also are considerable variations between rayons that have similar conditions (Figure 11). The remaining variations may be explained by other factors such as multi-language requirements, type of school, or catchment areas, but also by the inefficiencies in school network, managing class size, and recruitment of teachers and non-teaching staff. The Ministry of Education has observed irregularities in school financing, for example, payment of full-year salaries for seasonal workers (e.g., heating staff in winter) and electricity bills in schools without electricity. In-depth analysis of school-level data for each rayon is necessary to identify potential areas for further efficiency gains.

Figure 10: Per student unit cost and wage bill vary among oblasts, but without a clear correlation

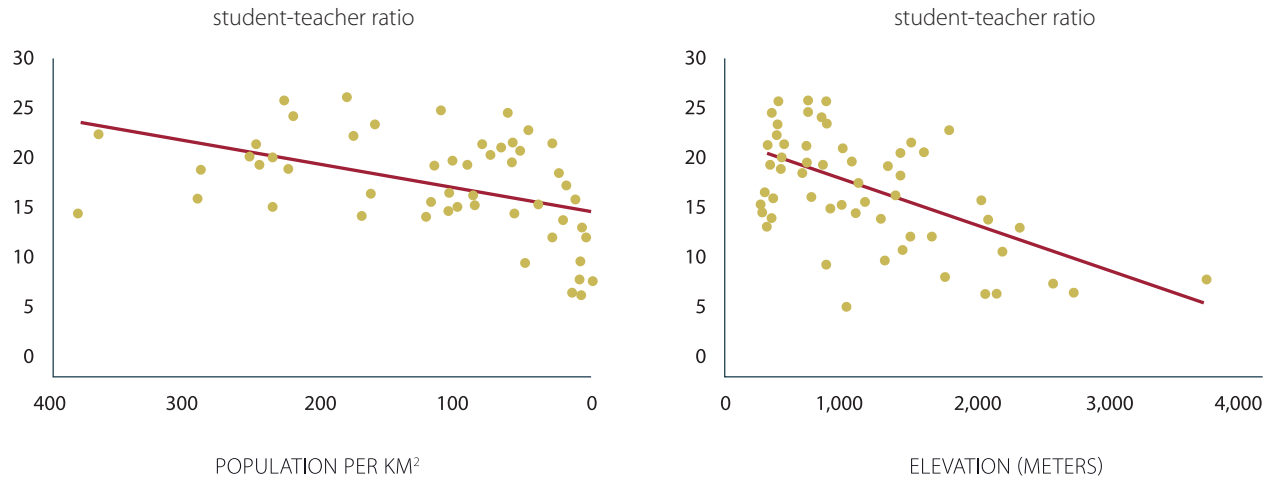*Per Student Spending by Oblast/Rayon, 2011 in TJS*
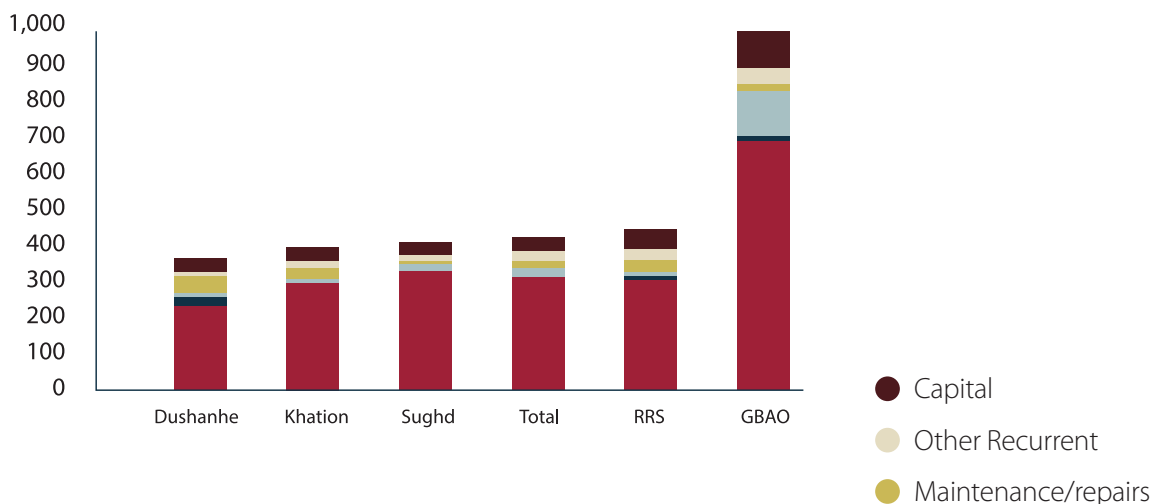
Percentage Distribution of Recurrent Spending 2011
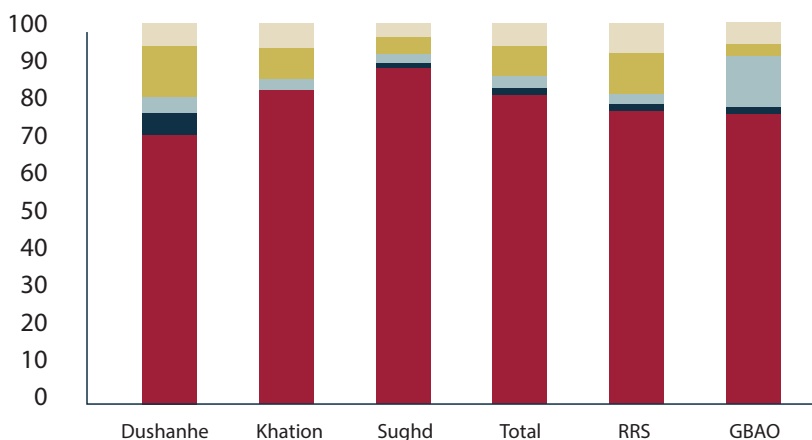
Source: Tajikistan BOOST v0.4 government expenditure database

Figure 11: STRs correlate with elevation and population density, but there are intra-oblast variations among rayons with similar conditions

Source: MOE, EMIS for STRs; Wikipedia (http://en.wikipedia.org/wiki/Provinces_of_Tajikistan) for the population density; and Avaneya, Vahram, 2012, *Improving the system of school financing in the Republic of Tajikistan on the basis of normative formula funding, final*, for elevation.

The successful implementation of the PCF reform is undermined by distorted incentives for schools reducing their wage bills. General education budget for each rayon is approved by the central government according to the PCF formula. However, if some rayons fail to raise revenues as estimated based on their fiscal capacity, education budget could be reduced. However, local governments continue to finance "protected" budget items (e.g.), whereas other (non-wage) expenditures are the first to be reduced. This means that schools, that have rationalized staffing and increased their non-wage budget for quality improvement, get penalized, whilst those that have kept many teachers are rewarded. The gap between the approved budget according to the formula and the actual execution has compromised the successful implementation of the PCF reform.

[a] Yovon, Kulob, and Vahdat rayons, and the cities of Khorog and Khojand.
[b] See World Bank, 2012, Tajikistan Public Expenditure Review Interim Report, Box 2 (p. 17) on the local government budget preparation process.
c Being in compliance was defined as having a budget that was 95 percent or greater as calculated using the PCF formula. This cut-off is based on the regulation that districts are entitled to reallocate up to 5 percent of the district-level budget, while ensuring that no school receives less than 95 percent of the budget as calculated by the PCF formula.
[d] The PCF reform has been supported under the Fast Track Initiative grants and the Ministry has engaged consultants to monitor and evaluate the implementation and produced a number of reports analyzing the outcomes and aiming to improve the mechanism.

Mauritania PER (2016)

Overall comment:

The Mauritania example reports disparities in per student resources and flags several critical regional-distribution issues related to equity.

The resources allocated to the regional offices are regressive. Poor and rural regions such as Guidimagha, Brakna, Gorgol, and Assaba, show a per student expenditure considerably below the national average (MRO 810 – 3 US$). At the same time, the number of students per teacher is high in these regions, between 45 and 64 (Figure 3.13). These data underline several critical regional distributional issues: (i) resources are not distributed based on need, as determined by the number of students, the conditions of the schools, and the poverty rate; (ii) the government struggles to hire and retain teachers in remote areas; and (iii) learning opportunities are more limited for poor students in remote areas due to lower spending on school inputs and fewer teachers in the classroom.

Figure 3.13: Budget per student, pupil/teacher ratio, and the poverty rate by region, 2015

Legend:
- Spending Per Pupil
- Pupil/Teacher Ratio (no. of students, right axis)
- Poverty Rate (in %, right axis)
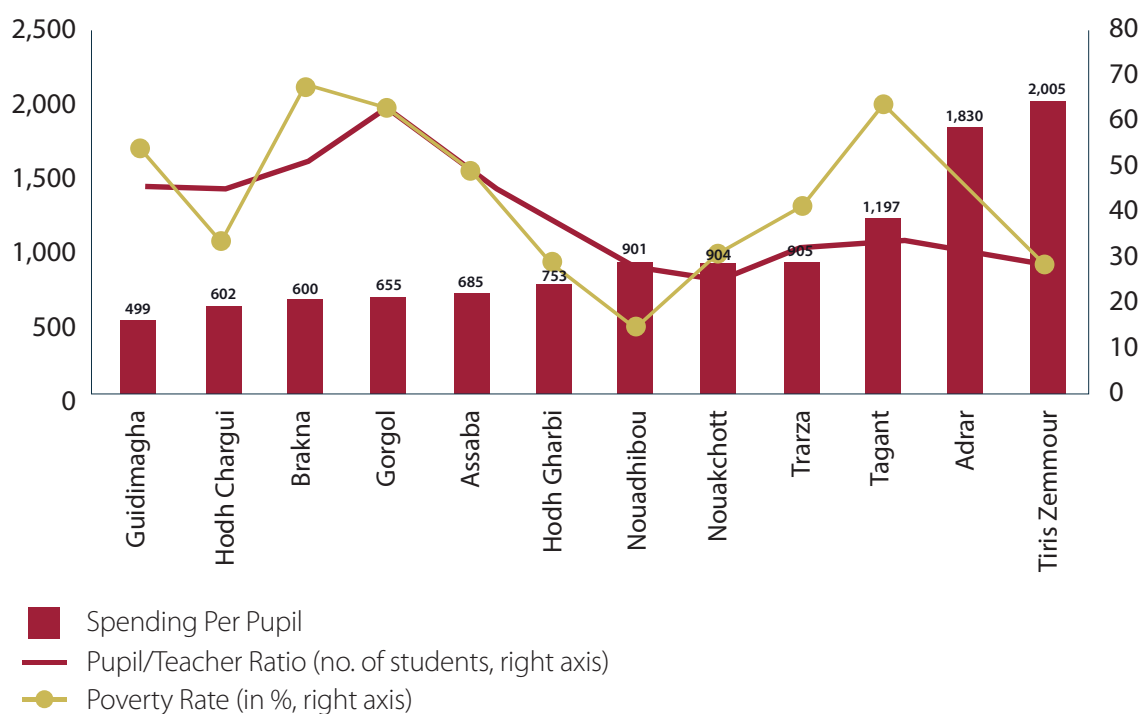
Source: Ministry of Education 2015

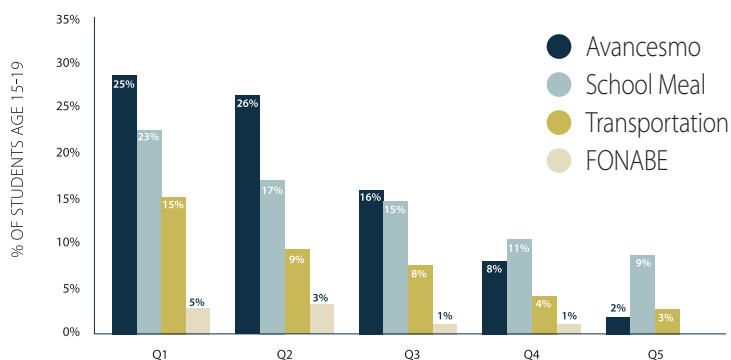### ⬤ Example 29: Analysis of cash transfer programs

Overall comment:

The Costa Rica and Indonesia public expenditure reviews examine the effectiveness of demand-oriented interventions, such as conditional cash transfer programs. The Costa Rica analysis finds poor targeting in the country's program. The Indonesia example assesses the impact of a cash transfer program that targets poor students and challenges related to the program's design, targeting, monitoring, and evaluation. The detailed Indonesia report also includes policy recommendations for addressing these challenges.

Costa Rica PER (2015)

The diagnostic, targeting and design of subsidies in secondary education can be improved. There are large socioeconomic differences both in the transition probability from lower secondary to upper secondary and from secondary to tertiary. Liquidity constraints can partly explain this difference. Evidence from the 2014 ENAHO shows that subsidies directed to students are poorly targeted (Figure 30). For instance only 29% of the 15-19 year old belonging to the first quintile of the household income distribution receives Avancemos, a conditional cash transfer (CCT) aimed at reducing dropout in secondary education among the poorest. On the contrary, among those in the fourth quintile of the income distribution, 8% report receiving this monetary transfer.

A recent evaluation (Hidalgo and Romero, 2013) shows that this CCT has a positive impact on dropouts and enrollments. In other words, the CCT helps students stay in school and helps those dropping out getting back to school. Although some students remain in education by other factors, between 10% and 16% of the students do so solely because of the CCT and would, otherwise abandon their studies. Likewise, re-entering the educational system do so for various reasons, but even higher percentage (77% or more) did so because of the transfer were given. Although the sample in the case of reintegration is much smaller than in the case of desertion, it cannot ignore the positive impact of the transfer is much higher in reintegration. Therefore, a better targeting of subsidies and transfers can significantly weaken the liquidity constraints that affect poorest households.

Figure 30: Takeup of transfer and subsidies by household income quintile, 2014

Source: World Bank SSEIR team's, authors' calculations using Household Surveys: ENAHO 2014

Indonesia PER (2012)

The *Bantuan Siswa Miskin* (Cash Transfer for Poor Students, BSM) program provides cash transfers from central education agencies directly to students or schools. Both *Kementerian Pendidikan dan Kebudayaan* (Ministry of Education and Culture, Kemdikbud) and *Kementerian Agama* (Ministry of Religious Affairs, Kemenag) have BSM transfers providing cash payments once enrollment, attendance and other criteria have been verified. The amount of the transfers provided rises with the level of education, from Rp 360,000 for primary school to approximately Rp 1.2 million (per year) for a university student.

Table 2: BSM at a glance

Official Program Name	Bantuan Siswa Miskin (BSM)
Program type	Cash transfer for poor students
Program Type and inaugural year (start/usage year)	Permanent, tax-financed, 2008
Coverage	National (100% provinces, 100% districts)
Number of beneficiaries (2010)	5.9 million
Official value of benefit	Rp 360,00-1,200,000 depending on level of schooling
Public expenditure (2010)	Rp 3,607 billion (US$ 397 million)
Administrative cost per recipient (2010)	Rp 15,608 (US$ 1.56)
Percent of poor 6-18 years old covered (year)	3.2% (2009)
Key policy and execution agencies	Kemdikbud, Kemenag
Key implementation agencies (role)	Kemenag, Kemdikbud (verification of beneficiary lists), Education service providers (targeting and eligibility, fund distribution)
Support operations partners (role)	PT Pos/appointed bank (fund distribution)
Local Government participation	Targeting, verification, socialization, monitoring and Evaluation

Sources and Notes: Kemenkeu, Susenas 2009, program manuals and World Bank staff calculations.

BSM spending has risen rapidly and it now ranks as the third-largest household-based transfer (by central government expenditure). BSM spending has increased in line with the rapid expansion in target beneficiaries. In 2010, Rp 3.6 trillion (around US$ 397 million) was spent on the program, equivalent to 4 percent of central government education expenditures. BSM accounts for 10 percent of all central government resources devoted to household-based social assistance (SA). Around half of BSM spending goes to primary and junior secondary school students, with the remaining going to senior high school students and university students at similar portion.

Table 3: BSM expenditure summary, 2008-2010

	2008	2009	2010
Total BSM (Constant, 2009 prices, Rp bn)	1,238	2,562	3,607
Primary school level (SD)	274	875	1,077
Junior secondary school level (SMP)	318	786	890
Senior secondary school level (SMA)	600	718	778
University level	46	183	863
Analytical Series:			
Total BSM (Constant 2009 prices, Rp bn)	1,343	5,856	3,339
Total BSM (US$, Rp million)	127	247	397
Share of central education expenditures (%)	2.2	3.0	4.0
Share of combined Kemdikbud and Kemenag (%)	2.1	3.0	4.1
Share of central government SA spending (%)	3.9	10.0	13.7
Analytical Series:			
Target number of beneficiaries (Million)	3.0	4.6	5.9
Average benefit level per beneficiary (Rp)	597,709	555,338	606,912

Sources and Notes: Kemdikbud and Kemenag records from Directorates General, Kemenkeu BPS, and World Bank staff calculations. Nominal expenditures have been deflated using the GDP deflator.

In total, there are 10 BSM initiatives, each with its own manual, fund flow structure, and implementing procedures. There is little coordination between initiatives, even those located in the same institution. The BSM program is national in scope but reaches very few students overall and does a poor job of identifying poor students. In 2009 program coverage (through the senior secondary level) was still small at 2.3 percent of all 6 to 18 year olds in Indonesia. Overall coverage of enrolled children is 3 percent. However, students from the poorest 40 percent of households account for approximately half of all BSM scholarships (and half of all rupiah distributed through the BSM program) while the middle-class and richer households in the top 60 percent capture an equal 50 percent of all BSM scholarships. In other words, a rupiah from the BSM program is equally likely to end up the hands of a poor student as in the hands of a non-poor student.

BSM does not target those who are unfamiliar with the school system and its administrators. BSM initiatives typically identify potential scholarship recipients by soliciting nominations from schools and school committees. Students nominated must have already achieved consistent attendance and demonstrated "good behavior" confirmed by the principal. Recently enrolled students or prospective new entrants have very little chance of being selected; likewise, those who have not made themselves known to the principal are unlikely to be selected.

BSM does not effectively address difficult and costly transition periods - between elementary and junior secondary, and again between junior and senior secondary - when the overwhelming majority of dropouts occur. Verification procedures plus slow rates of disbursement together mean that recipients typically receive a BSM transfer for their first schooling year only after their second schooling year has already started.

Support operations like monitoring and evaluation are partly delegated to schools, which are also the main agency in charge of delivering BSM funds to beneficiaries. This has led to weakness in non-benefit program operations. Within the 10 different BSM initiatives, very few budgeted funds are spent on socialization, monitoring and evaluation, and complaints, appeals, or grievances.

BSM could be a valuable program for poor households and for Indonesia generally if it were better targeted, better socialized, and benefit packages were revised to correspond to the risks that poor students face. Poor households are not translating primary school enrolments into frequent success in higher levels of education. Education costs, especially for senior secondary, are rising in real terms. Poor households in particular are facing the biggest increases in real education expenditures (at all schooling levels). By providing benefits adequate for meeting the real costs of education precisely when those higher costs arrive, the BSM program could serve an important risk-mitigation function and inducement to higher education for poor households. Unfortunately the BSM program does not have any of these characteristics and its effectiveness is consequently lowered.

⬤ Example 30: Benefit incidence analysis

Democratic Republic of Congo PER (2015)
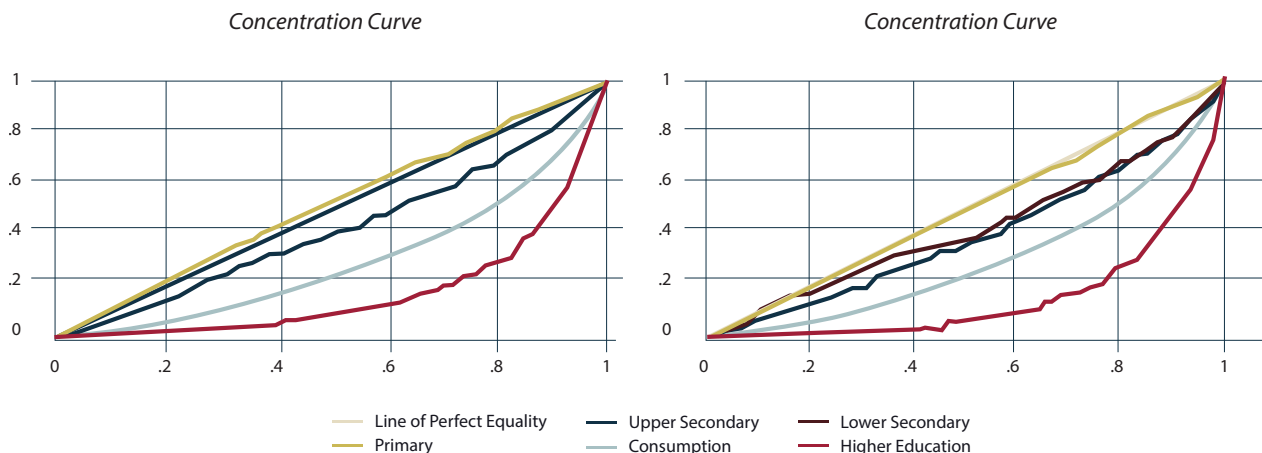
Overall comment:

The DRC example conducts a classic average (or simple) benefit incidence analysis of the distribution of education public expenditures across different levels of education. It provides an example of a common situation where public spending in lower levels of education (in this case, primary and secondary) is progressive, while higher-education spending is significantly pro-rich and regressive. The example also provides a subnational- (provincial-) level benefit incidence analysis revealing variance in public-resource distribution across quintiles by province.

A BIA (Benefit Incidence Analysis) using the concentration curve to evaluate the targeting of government subsidies shows that the distribution of public expenditure in primary and secondary education is relatively more biased towards the poor than the distribution of income. Figure 34 includes the consumption concentration curve, which is a proxy for the general wealth and income inequality across quintiles. Compared to the consumption concentration curve, the expenditures on primary, lower secondary and upper secondary education are relatively more equitable than the general wealth distribution. This can be observed from the concentration curves in primary, lower and upper secondary lying above that of the consumption curve, indicating that spending in these levels tend to be more equitable.

Therefore, while public spending in primary and secondary education levels is not pro-poor per se, this is somewhat mitigated by the fact that the distribution of spending promotes greater equality than the general observed income inequality. In contrast, higher education is significantly not pro-poor and is regressive. Given that the richest quintile receives the most benefit from public spending- the distribution of public spending in higher education is in fact worse than the general wealth inequality.

Even though public spending on education is less regressive than is income distribution, such spending nonetheless benefits the rich much more than then poor. Moreover, the inequality becomes higher at higher levels of education. Figure 34(a) presents the BIA without adjusting for demographic factors and Figure 34(b) presents the analysis taking into consideration demographic factors. In general, public spending on education is pro-poor if the concentration curve for the particular level of education is above the 45-degree line. Figure 34(a) shows that the concentration curve for primary education spending is just above the line of perfect equity, while that of post-primary education spending is entirely below the line of equity. However, after adjusting the spending data in each quintile for variations in number of children by quintile, spending in all levels of education fall below the perfect equity line, including at the primary level. This suggests that public spending in education in the DRC favors the richer households at all levels of education since the poorest quintile receives lower shares of public spending.

Figure 34: Lorenz curve for household consumption expenditure and public spending on education by level

Concentration Curve   *Concentration Curve*

Line of Perfect Equality — Upper Secondary — Lower Secondary
Primary — Consumption — Higher Education

Sources: Author's estimations based on Ministry of Budget, EMIS, SECOPE, and HBS 1-2-3, 2012

The provincial level BIA analysis reveals that public resource distribution across quintiles varies to some degree by province where Kasai Orientale appears to be the most equitable province while Equateur is the least equitable. Figure 35 depicts the overall distribution of public funds by quintile and province. For example, about 27 percent of total public funding benefits the richest quintile in Kasai-Orientale while the lowest quintile receives about 17 percent (3 percent below their population share). The corresponding figures for Equateur are 39 percent and 10 percent, respectively.

Figure 35: Provincial level benefits incidence analysis of public expenditure on education - all levels of education
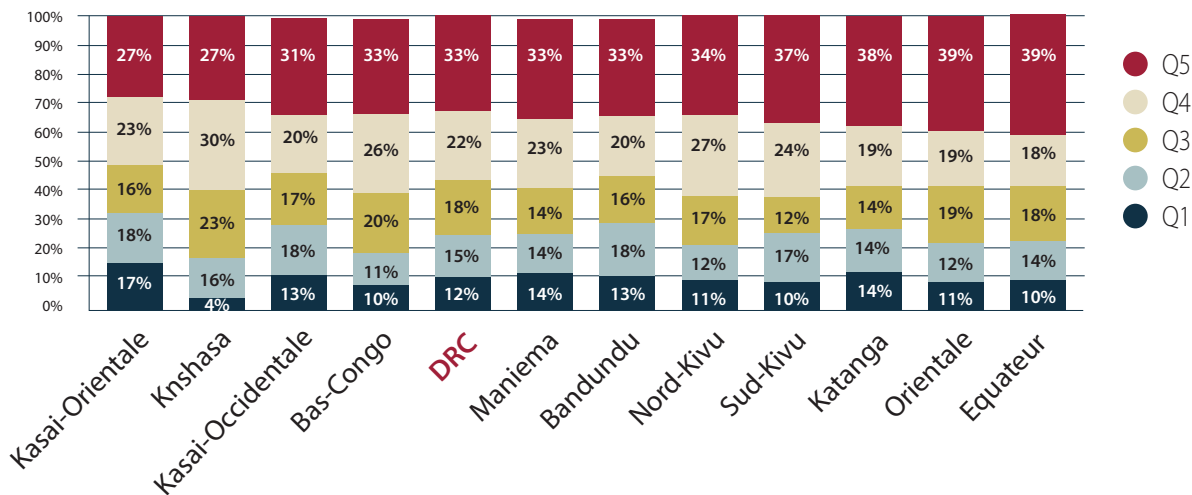
Source: Authors' estimations based on Ministry of Budget, EMIS, SECOPE, and HBS 1-2-3, 2012

🔵 Example 31: Analysis of private spending by income quintile

Madagascar PER (2015)

Overall comment:

After Madagascar's 2009 military coup, the Government faced a severe budget crisis. Where they could, families tried to fill public expenditure gaps in the education sector to keep their schools operating. Given this context, this PER prioritized an analysis of household contributions to education. It assessed the impacts of the shift to more private financing of education on households in different income quintiles and on enrollment outcomes. The analysis relied on two household surveys (2005 and 2010) and new survey data collection

Distribution of household expenditure by income levels and regions

In the recent years, private spending on education has generally increased, with some direct impact on enrollment. Since the crisis, a greater number of households with a child in Grade 2 has had to pay enrollment fees, PTA contributions and monthly school fees (Table 20). The share of households paying enrollment fees has increased the most, by 7 percentage points, against 4 percentage points for the share paying PTA contributions and one percent for those paying school fees. In addition to be more frequent, the amount paid in school fees have generally increased. Average household per pupil spending increased from Ar 6,561 to Ar 8,277, representing a 26 percent increase over three years.[a] This has had direct repercussions in terms of enrollment. Indeed, financial problems are the first reason given by household to explain dropout, and this has only worsened since the beginning of the crisis in 2009.

Table 20: Share of households in the southern districts that paid enrollment fees, PTA contributions and monthly school fees, 2009 and 2012 (sample selection)

Percent	2009	2012	2009-12 Gap (% Points)
Households having paid enrollment fees	34.6	41.5	6.9
Households having paid PTA contributions	36.5	40.9	4.4
Share of parents having paid late	71.4	85.2	13.8
Parents exempt from PTA contributions	20.0	14.5	-5.5
Households having paid monthly school fees	12.5	13.8	1.3

Source: South Survey in the Districts of Amboasary and Betioky, 2009 and 2012.

The share of household budget spent on education increased more for the richest. To interpret this data, it is important to note that, in Madagascar, the poverty level is situated around the average level of consumption in the fourth quintile (and even closer to the high end of the fourth quintile in 2010). The distribution in 2005 was U-shaped, with the poorest spending a higher share of their income than households in the second, third and fourth quintiles. The situation was more clearly progressive in 2010, with shares of income increasing for the richer households, but this came with an increase in household expenditures on education for all but the bottom two quintiles, with all quintiles paying a higher share of their budget in 2010.[b] Looking at average education expenses per child in school, there was a slightly higher cost in the third and fourth quintiles in the bottom two and richest quintiles (Figure 26).

Figure 26: Household direct education expenditure, 2005 and 2012
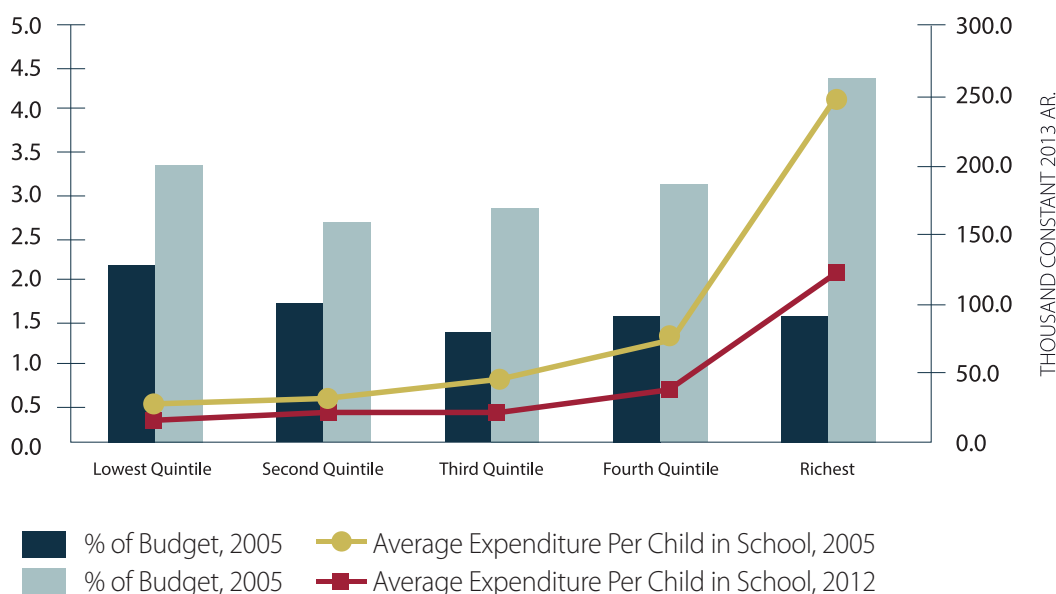
Source: EPM 2005 and ENSMOD 2012.

The cost per child in school differs significantly by region, and is inversely related to poverty rates. Correlation coefficients with contemporaneous poverty are negative and significant (-0.70 in 2005 and -0.90 in 2010), after adjusting for regional price variations. The strong correlation results hide some important variance across regions, however, especially when looking at changes in costs between 2005 and 2010 (Figure 27). Changes across time show that all regions experienced an increase in cost in real terms, except for Ihorombe. Regions with the highest poverty rate in 2005 also experienced some of the highest increases in expenditure per child in school (Sofia and Atsimo Andrefana, in particular).[c]

Figure 27: Primary attendance rate and the share of household budget on education by region, 2012
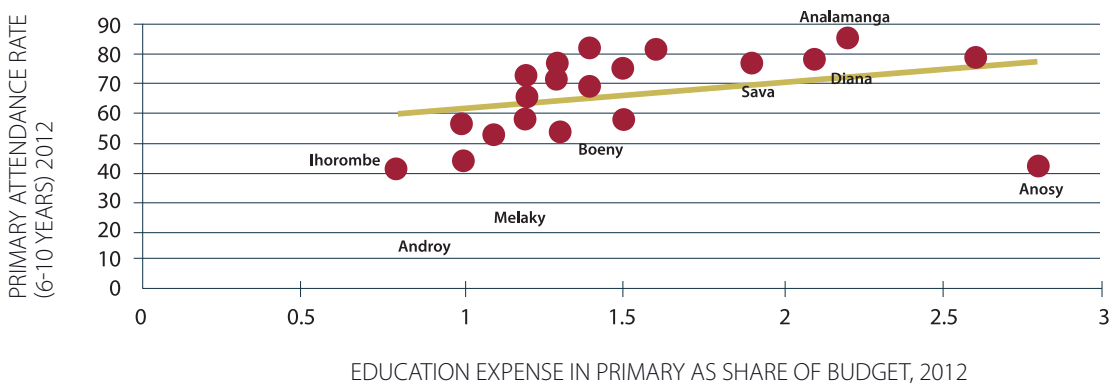
Source: ENSOMD 2012.

The share of primary education in the household budget is weakly related to primary attendance rates, indicating that the private cost of public education can be higher for families living in regions where attendance is low. According to 2012 Household Survey data, the share of education in household expenditure increases with primary attendance, but the correlation coefficient is weak (0.34). Figure 28 shows differences across regions. The regions of Analamanga, Diana and Sava stand the highest attendance rate with greater share of household expenditure on education, whereas the region of Anosy has a high household expenditure with less attendance primary rate.

Figure 28: Cost per child in school by region, ranked by poverty level, 2005 and 2010
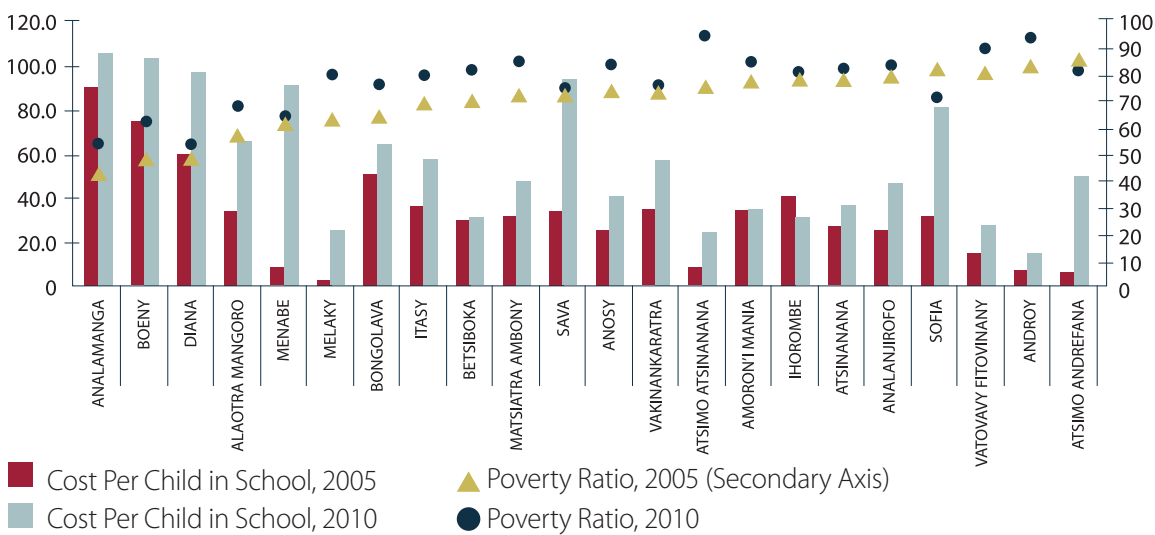

Note: Cost per child is adjusted to reflect prices in the capital.
Data source: Household Surveys 2005 and 2010.

The share of education expenditure in the household budget is also negatively correlated with poverty levels.[d] Correlation coefficients are negative and significant in both years (-0.51 in 2005, and -0.59 in 2010), although confidence intervals do not allow for establishing whether the relationship is indeed stronger in 2010. Figure 29 also shows that the strong correlation result hides significant variance across regions with a similar pattern as noted above.

Relationship between out-of-pocket and public expenditures on education

Households are financing an increasing share of the total costs of education (Box 9). In order to refine the analysis on how education is financed in Madagascar, it is important to compare public and household expenditure. Over 2006-2008, current public expenditure contributed, on average, to 73 percent of expenses of one child enrolled at school, whereas household expenditure represented, on average, 27 percent (Figure 30). In some regions (Vatovavy-Fitovinany, Melaky, Atsimo Atsinanana, Androy and Atsimo Andrefana), the share of public expenditure per child in school reached more than 80 percent over this period. However, from 2009 to 2013, the share of current public expenditure was, on average, 59 percent of total spending per child enrolled. This reflects a substantial increase in the share of the costs per child enrolled financed by household. The increase was higher in Atsimo Andrefana, Menabe and Vatovavy Fitovinany, three regions that are particularly vulnerable.

**Figure 29: Burden of education expenditures by region, ranked by poverty levels, 2005 and 2010**
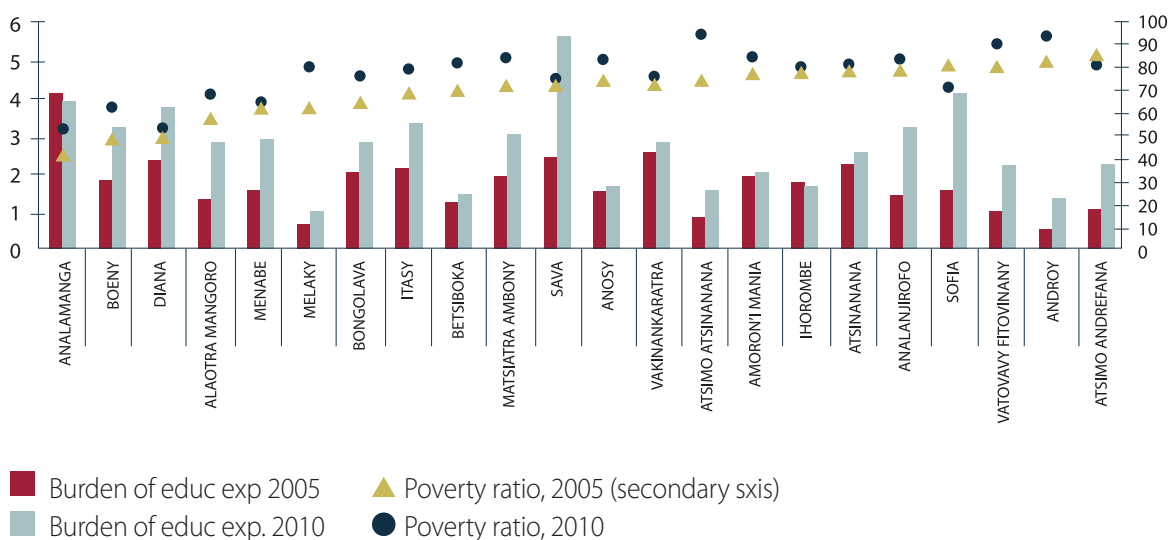
Note: Burden=share of education expenditure in household budget averaged by region.
Data source: EPM.

Box 9. Parents' Contribution to School Financing: Results From a Field Study

The results of the survey carried out for this study (non-nationally representative) show that household expenditures averaged 18,000 MGA for a child in primary school, ranging from 27,000 MGA in Analamanga to 7,300 MGA in Melaky. Parental contributions to school expenditures averaged more than 21,000MGA in the regions of Analamanga and Atsinanana. A survey conducted by MEN in 2013-2014 in 30 schools of the Antananarivo Renivohitra CISCO showed comparable results, included an average contribution of parents to the school budget of 18,410 MGA, varying from 5,000 MGA to 28,000 MGA. In 30 surveyed schools, the collected resources reached a total of 128 million MGA, an average budget of 5.3 million MGA per school.

Parental contribution for a child enrolled in primary school (EPP)
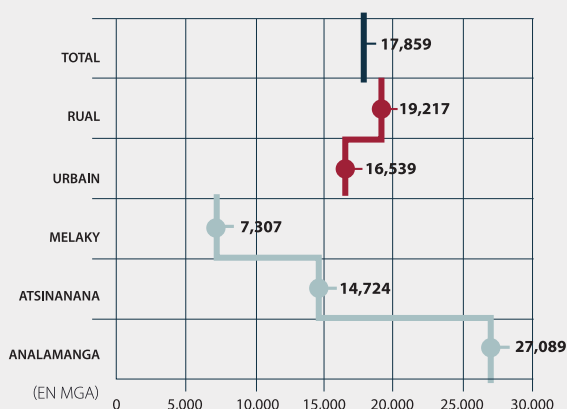
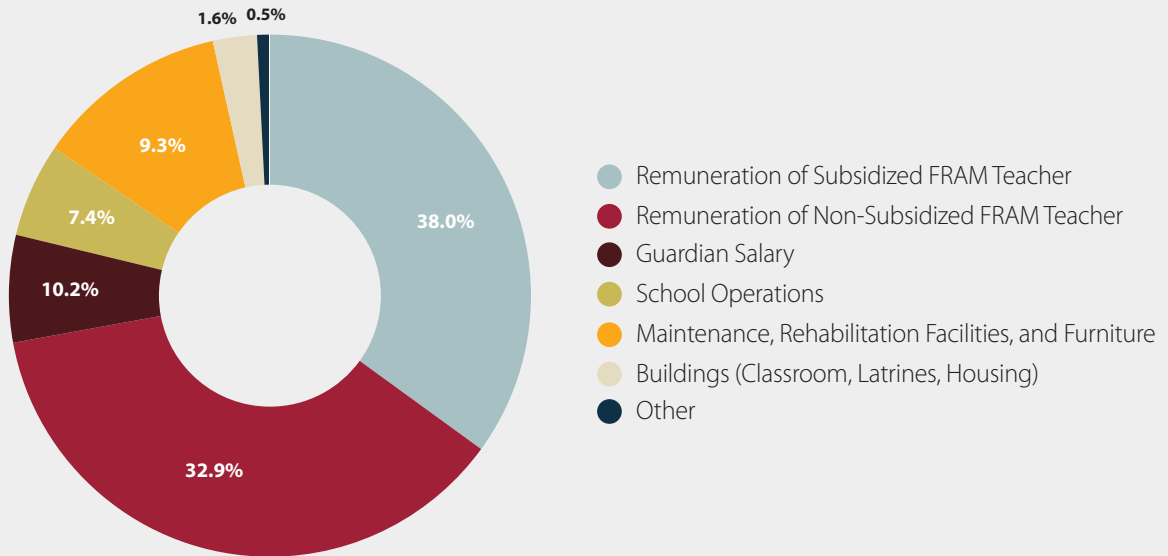*Source :* Survey conducted during the study

Parental contribution to school expenditures : distribution by area –(in MGA/parent/year)
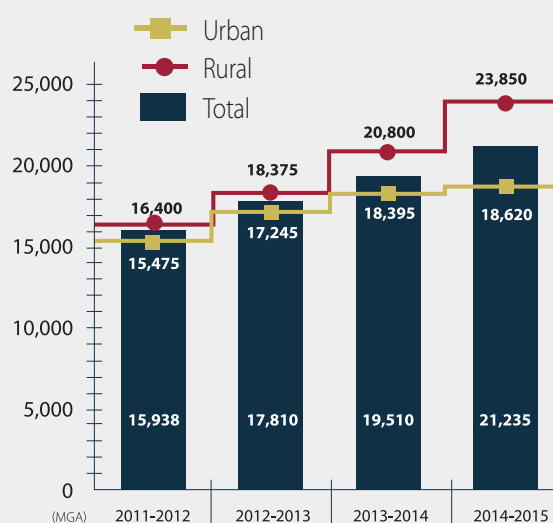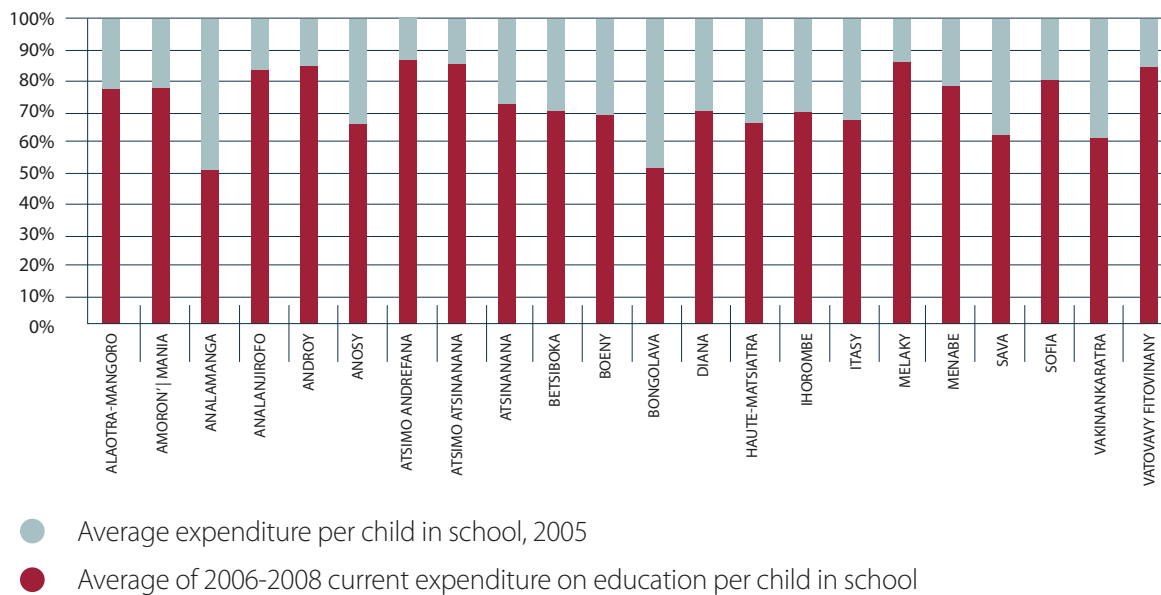
Source : Survey conducted during the study

Parental contributions are essentially used to pay community teachers and the school keeper, purchase supplies, pay for repairs, and finance report cards and school sports. With the contribution of parents, the surveyed schools provide a monthly subsidy to subsidized and non-subsidized community teachers. The amounts are almost equivalent, 63,500 MGA/ month for the non-subsidized community teachers and 61,150 MGA/month for subsidized community teachers. Nearly 72 percent of parents consider that the level of the subvention is more than they can afford (52.6 percent) or is rather high (19.2 percent). Moreover, parents' satisfaction with the performance of teachers differs according to their status. The highest satisfaction rates go to the subsidized community teachers (92 percent) surpassing the satisfaction rates of the civil servants (less than 86 percent), and largely surpassing the satisfaction rates for the performance of non-subsidized community teachers (37 percent).
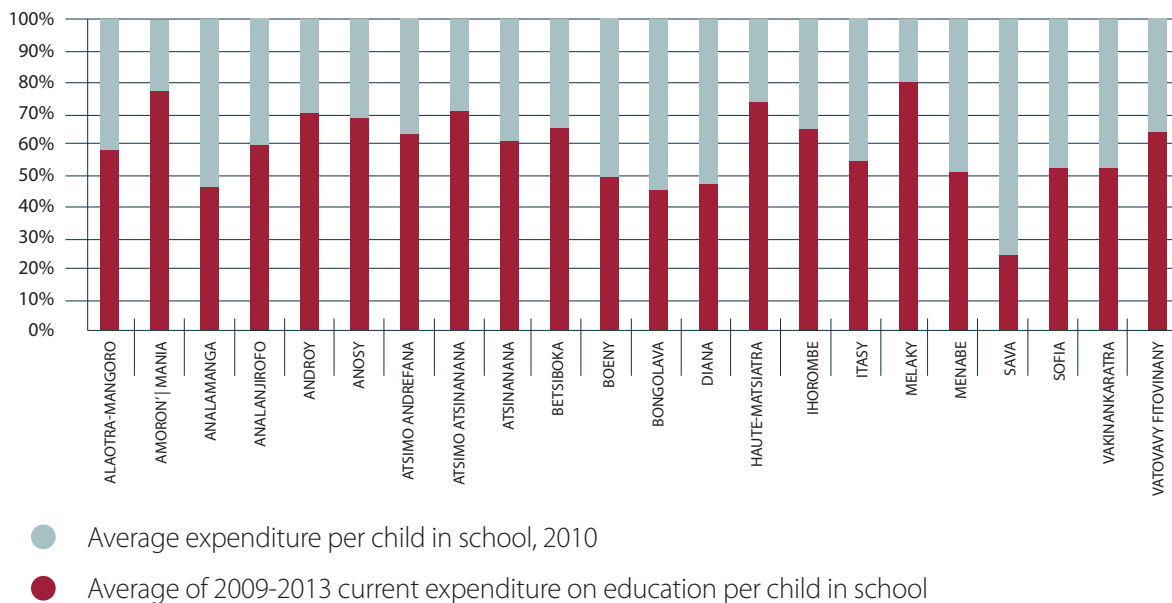
Breakdown of the use of school budget realized through parental contributions

1.6%   0.5%

9.3%

7.4%

10.2%

38.0%

32.9%

- Remuneration of Subsidized FRAM Teacher
- Remuneration of Non-Subsidized FRAM Teacher
- Guardian Salary
- School Operations
- Maintenance, Rehabilitation Facilities, and Furniture
- Buildings (Classroom, Latrines, Housing)
- Other

Source : Survey conducted during the study

Figure 30. Average household expense per child compared to per pupil government education expenditure, 2005 and 2010

- Average expenditure per child in school, 2005
- Average of 2006-2008 current expenditure on education per child in school

● Average expenditure per child in school, 2010

● Average of 2009-2013 current expenditure on education per child in school

Note: The expenditure data is averaged over 2006-2007 for salaries by region and 2006 and 2008 for other current expenditure.
Data sources: EPM 2005 and 2010, MFB.

[a] Annex B explains the difference between the two groups: Sample Selection and Tracer Study.
[b] A lower budget share in the poorest quintile would not have led to a positive interpretation, however, as it would have likely meant that the poorest students do not go to school altogether, which is not desirable.
[c] The correlation coefficient between the change in cost and poverty rates are, however, not significant.
[d] The burden was also measured as the average household expenditure per child in school relative to per capita expenditures in the region, giving similar results (corr -0.55 in 2005 and -0.59 in 2010)

NOTES

1. The Systems Approach for Better Education Results (SABER) is a World Bank initiative that produces comparative data and knowledge on education policies and institutions, with the aim of helping countries systematically strengthen their education systems. SABER evaluates the quality of education policies against evidence-based global standards, using new diagnostic tools and detailed policy data collected for the initiative. These key questions are aligned with the SABER School Finance Conceptual Framework discussed in "What Matters Most for School Finance: A Framework Paper" (2013), in the SABER Working Paper Series. A more detailed explanation of the SABER School Finance instrument is available at http://saber.worldbank.org/index.cfm?indx=8&pd=3&sub=0.

2. See Freinkman and Skhirtladze (2015) for a detailed review of 75 public expenditure reviews that cover multiple sectors.

3. "Fiscal space" is defined as "room in a government´s budget that allows it to provide resources for a desired purpose without jeopardizing the sustainability of its financial position or the stability of the economy" (IMF 2005). The education sector can create fiscal space by cutting inputs to the sector (e.g., reducing the size of the teaching force) or by obtaining those inputs at a cheaper cost (e.g., introducing procurement reforms to produce large savings in textbook costs).

4. World Bank staff may consult budget information through the Education Global Practice website.

5. SABER's education management information system assesses data quality as one of the policy areas. Its four policy levers include (i) methodological soundness, (ii) accuracy and reliability, (iii) integrity, and (iv) periodicity and timeliness. For details about the assessment methodology, see http://saber.worldbank.org/index.cfm?indx=8&pd=2&sub=0.

6. UNESCO's International Standard Classification of Education (ISCED) is used to categorize and report cross-nationally comparable education statistics. UNESCO's Institute of Statistics uses these categories to report data on education finance, such as a government's per capita expenditure by ISCED-based levels of education. ISCED 2011 is the latest version and is available at: http://www.uis.unesco.org/Education/Documents/isced-2011-en.pdf.

7. Fiscal imbalance is a mismatch in the revenue powers and expenditure responsibilities of a government. Horizontal fiscal imbalance occurs when subnational governments are able to raise either more or less funds from their tax base than they need to cover the cost of providing services. Equalization transfers can help to mitigate horizontal imbalances. Vertical fiscal imbalance describes the variance between a central government's revenue and expenditures against those of regional governments. It is a structural issue and thus needs to be corrected by reassignment of revenue and expenditure responsibilities among different levels of the government.

8. In contract theory and economics, information asymmetry deals with the study of decisions in transactions where one party has more or better information than the other. This creates an imbalance of power in transactions, which can sometimes cause the transactions to go awry.

9. An externality is a side effect or consequence of an activity that affects other parties without this being reflected in the cost of the goods or services involved, such as the pollination of surrounding crops by bees kept for honey, or a factory's pollution of the air of nearby communities.

10. Rent-seeking is the use of the resources of a company, an organization, or an individual to obtain economic gain from others without reciprocating any benefits to society through wealth creation. An example of rent-seeking is when a company lobbies the government for loan subsidies, grants, or tariff protection. The process of lobbying government is a political process. Economists call such lobbying "rent seeking" because the objective is to secure economic rents that are higher than the normal profits obtainable by competing in the economic marketplace.

11. Elite capture is a process whereby resources transfers designated for the benefit of the larger population are usurped by a few individuals of superior status–be it economic, political, educational, ethnic, or otherwise.

12. For detailed definitions of functional and economic classifications of expense, see International Monetary Fund (2014).

13. For a discussion on textbook management, see Read (2015).

14. See Chapter 7 in World Bank (2004).

15. Education improvements in Rwanda in the 2000s, for example, have been linked to better funding arrangements as a result of public financial management PFM improvements, a sector-wide approach program (SWAP), and decentralization policies (ODI 2009). Similar improvements were seen in Cambodia, where a program that supported PFM improvements across a number of sectors, including education, found lower repeat rates for students in select provinces (Wescott 2008).

16. See PEFA (2016a) and PEFA (2016b).

17. These international targets on education financing are included as reference points in UNESCO (2015b).

18. The Department for International Development is held to value-for-money standards by its oversight body, the Independent Commission for Aid Impact (ICAI). The Commission operates independently of Government, and reports directly to the International Development Committee of the UK Parliament.

19. See Barnett, C. et al. (2010) and Department for International Development (2011) on value for money.

20. See, for example, Coelli, et al. (2005) and Herrera and Pang (2005).

21. See Psacharopoulos and Woodhall (1985) and UNESCO et al. (2014), Chapter 2.

22. See Psacharopoulos and Woodhall (1985), Chapter 5.

23. Other relevant policies and programs range from inclusive education programs, to special training programs for teachers in disadvantaged schools, to education programs targeting specific groups of students.

24. See Birdsall, Ibrahim, and Gupta (2004) for public policies that can increase demand for education.

25. As pointed out in ⬤ **Technical Note 4**, in 2013 Transparency International published a comprehensive analysis of sources of corruption by level of education. See: https://www.transparency.org/whatwedo/publication/global_corruption_report_education.

26. Data collection and analytical instruments are available at: http://saber.worldbank.org/index.cfm?indx=8&pd=3&sub=4.

27. See Jensen and Wolde (2016) for details.

28. SDG 4 aims to "*ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.*" (The 2030 Agenda for Sustainable Development and the Sustainable Development Goals, https://sustainabledevelopment.un.org/sdg4).

29. For information on 2001 survey, see Kattan and Burnett (2004); for information on 2005 survey, see Kattan (2006).

30. An introductory primer on PETS/QSDS is Reinikka and Smith (2004). Other resources are Reinikka and Svensson (2002); and Dehn, Reinikka, and Svensson (2003).

31. In Sub-Saharan Africa, annual losses of textbooks have been found to be as high as 65 percent in some countries (Read 2015).

32. These committees consist of three government representatives and three democratically elected representatives of the program's beneficiaries.

33. The World Bank developed this tool in partnership with the African Economic Research Consortium and the African Development Bank, and launched it in 2013.

34. For more on MAMS, see www.worldbank.org/mams; and Lofgren, Cicowiez, and Diaz-Bonilla (2013).

35. The J-PAL is a network of 136 affiliated professors from more than 40 universities. The methodology and research results can be found at: https://www.povertyactionlab.org/policy-lessons/education/increasing-test-score-performance.

36. For example, see Glewwe et al. (2011).

37. A cost-efficiency analysis is typically not conducted in public expenditure reviews, but is often conducted in project appraisal documents during a project preparation.

38. For instance, Alonso and Sanchez (2011) compare different funding models.

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