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Budget Credibility Across Countries

How Deviations are Affecting Spending on Social Priorities

Paolo de Renzio, Jason Lakin, Chloe Cho

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Paper

EXECUTIVE SUMMARY

As countries increasingly focus on implementing policies in pursuit of the Sustainable Development Goals (SDGs), attention is often focused on the financing gap governments face in meeting their commitments. Not enough questions are being asked about governments' capacity to effectively manage and spend the resources that they already have – or say they have. In this paper, we use a new dataset to look at how "credible" government budgets are across the world – by "credible" we mean the extent to which actual spending matches the approved budget – both in terms of overall revenue and expenditure, and in terms of the allocations and spending in specific sectors, such as health or education.

Prior research on budget credibility, particularly in low- and middle-income countries, is limited, and usually focused on single countries. To our knowledge, only two other studies have looked at these challenges across a large sample of governments. Here, we examine spending deviations – both aggregate and in specific categories – using data for 35 countries at different levels of income for the period 2009-2017.

KEY FINDINGS

Overall, on average, national budgets are being underspent by almost 10%. This finding suggests that governments face serious obstacles in sticking to their plans during budget execution, which may affect the delivery of public services.

The problem is even more evident in poorer countries, where budget systems are weaker and where reliance on external financing is greater. In our sample, on average, national budgets were underspent by 14% and 13% in low- and lower-middle-income countries, and by 7% and 0%, respectively, in upper-middle- and high-income ones.

Budget deviations are much larger and negative for capital spending (-18%) than for recurrent spending (-4%), mostly on account of spending on salaries and transfers. This is consistent with previous research on this topic – capital spending involves complex procedures and is more easily reduced, delayed, or cancelled than spending on civil servant wages.

Not all sectors are affected equally; the biggest losers tend to be the economic (including agriculture, energy, transport, etc.), environmental protection and housing sectors. In contrast, spending on defense and social protection tends to rise during implementation relative to other sectors. Again, we find that changes in a sector's spending relative to the overall budget are often linked to relative underspending on capital or overspending on recurrent spending – especially wages. The high degree of uncertainty about what share of approved funding will end up being available for each sector wreaks havoc on sector planning.

Underspending affects important areas that have been targeted for social and economic development. For example, within the economic affairs function, the most affected sector was agriculture – a primary source of employment in low-income countries – where much-needed investment in irrigation was often substantially underspent. In education and health, budgets for infrastructure improvements (e.g., construction of schools and hospitals) and for immunization stood out for their rate of underspending. Although these resources may amount to a small percentage of a typical national budget, the resulting impact can have far-reaching consequences on people's lives.

These averages hide dramatic variation among countries and over time. For aggregate budgets, deviations spanned from underspending of almost -56% (Benin 2010) to overspending of nearly 20% (Myanmar 2011). Funding for housing was virtually cancelled in some extreme cases like Burkina Faso in 2009 or São Tomé and Príncipe in 2016 – but, on the other extreme, in Ecuador in 2012, the same sector was overspent by more than 300%.

Several country cases deserve further attention. In the final part of our analysis we look at what happens within individual countries. Although the evidence broadly confirms our overall findings, some interesting cases surface of governments that either manage their resources in ways that seem better aligned with efforts to improve development outcomes – e.g., putting additional resources into public investment in economic sectors – or that, on the contrary, consistently reduce funding to social sectors during budget implementation.

Solutions to the budget credibility challenge will inevitably vary from country to country, but they are likely to involve different actors playing complementary roles. For example, governments will have to put systems in place and strengthen capacities to ensure that budgets are more credible and that deviations are gradually reduced. Oversight bodies and civil society groups will have to more closely monitor budget execution and hold governments to account for delivering on their plans. And international donor agencies should improve aid predictability, improve reporting arrangements and support relevant capacity-building activities.

CONTENTS

1. INTRODUCTION[1]

Promoting socioeconomic development is both the most important task and the greatest challenge facing governments across the world. Priorities are many, resources are scarce, and systems and capacities are often inadequate, especially in developing countries. In 2015, the United Nations adopted the 2030 Agenda for Sustainable Development (UN 2015), reflecting years of painstaking negotiation among governments worldwide, and incorporating the views of a large number of citizens and organizations who participated in the extensive consultations that went into its drafting (UNDG 2013; Fox and Stoett 2016). The resulting Sustainable Development Goals (SDGs) set out an ambitious agenda for promoting development over the next decade, encompassing three complementary dimensions – economic, social and environmental – and identifying key areas for governments' focus. With the job of identifying shared priorities accomplished, many have turned their attention to the concrete implementation challenges confronting governments in the years ahead. These are inevitably numerous but can be broadly considered to fall into two categories: (1) raising the necessary resources to finance the envisaged expansion of public services and public investment, and (2) addressing the weaknesses of developing countries' policies and institutions to make them more targeted and effective.

As with the previous set of global development objectives, the Millennium Development Goals (MDGs), a critical question for many observers is: how will countries finance the investments needed to reach the goals? Studies that assess SDG spending needs have already started to appear (e.g., Schmidt-Traub 2015, IMF 2019), at times giving the impression that a lack of sufficient resources is the main stumbling block. Yet, while necessary, additional resources alone will not be sufficient. Many important objectives do not depend solely on additional funds for their achievement. For example, advancing gender equality may depend on legal and regulatory reforms just as much as on funding targeted interventions. And reducing inequality can partly be achieved by making the tax system more progressive, rather than by spending to boost poor people's incomes. We also know that the links between public spending, service delivery and poverty reduction may vary across countries and are at best complex (Fan 2008; Clemens et al. 2007; Paternostro et al. 2007, Anderson et al. 2006; Wilhelm and Fiestas 2005). Transforming increased public spending into improved development outcomes requires many intermediate steps and depends on governments' capacities and on the quality of governance and institutions.

Among the various forms of institutional capacity that are relevant for converting public funds into services is the ability of governments to plan and budget effectively. This paper aims to contribute to a better understanding of this area by analyzing the use of public resources from the perspective of "budget credibility," defined here as the extent to which governments spend the financial resources at their disposal according to their own approved

[1] This paper was originally published in July 2019 and updated in September 2019 to include additional information.

budgets. We investigate issues related to budget implementation as a key aspect of governments' capacities to deliver on their promises and contribute to the achievement of development objectives. Even though more resources can and should be made available to various priority sectors in pursuit of the SDGs, it is important to verify that governments are in fact able to spend the resources that they say they can already count on. To that end, the key questions that this paper tries to address are:

1. How credible are government budgets across the world and in specific countries?

2. How do deviations from approved budgets affect spending in different areas of government intervention?

To answer these questions, we use data that has become available in recent years for 35 countries at various income levels and provides detailed information on approved vs. executed budgets across various sectors.

This analysis demonstrates that budget credibility is an important challenge across countries: on average, governments significantly underspend compared to their originally approved budgets and the underspending is more pronounced in lower-income countries. The numbers also show that significant shifts in the composition of spending underlie the aggregate deviations, meaning that executed budgets often look quite different from approved ones. On average, governments increase recurrent spending and reduce capital investment, and shift resources to sectors such as defense, public safety, general public services, education and social protection, while substantially reducing funding for economic affairs, environment and housing. This raises many questions about governments' capacity to manage infrastructure investment and to effectively promote socioeconomic development.

2. GOVERNMENT BUDGETS AND THEIR CREDIBILITY

Budgets are the key policy tool that governments have at their disposal to translate their policies and plans into specific programs and activities. They have been defined by some as a "social contract" between governments and citizens, where citizens pay taxes in exchange for the delivery of a specified set of goods and services (Wildavsky 1984; Schick 2011). In this sense, their importance in government efforts to achieve their policy objectives – e.g., the goods and services that they agree to deliver to citizens – is quite obvious. For example, if a government wants to improve educational levels, several resource-intensive activities are likely to be necessary, from additional investment in school infrastructure to recruitment and training of new teachers, to purchase of school materials, and so on. Such additional investments need to be planned over a multi-year period and funded through the annual budget.

In most countries, a budget proposal is prepared by the executive and sent to the legislature for approval, after a period of review during which amendments can be introduced. The approved budget then becomes law, authorizing the executive to raise and spend resources on specific programs and activities during a set period, which normally covers one year. This does not automatically ensure that the money is spent on these services during the budget year, however.

What happens during budget implementation is very important in terms of ensuring that authorized amounts are duly collected, allocated and disbursed to support government operations. This is what allows for the payment of teachers and doctors' salaries, infrastructure contracts, and all other items that guarantee the delivery of public services and the normal functioning of government. Differences between the originally approved funding and the money-actually-spent will occur, and in some cases are well justified, as in the case of responding to external economic shocks or to natural disasters. In fact, some governments go through a formal process of revising their originally approved budgets when changes in external circumstances demand it or when substantial policy shifts occur; they do this through so-called "supplementary budgets" which are again submitted to and approved by the legislature. In most cases, however, it is reasonable to expect governments to deviate from approved budgets only in a limited way, both as a sign of their capacity to plan adequately, and of their commitment to delivering on stated policy priorities.

In this paper, we use the term "budget credibility" to refer to the degree to which governments execute budgets as planned – and as approved by legislatures. Budget credibility has been recognized in the SDG framework as an important component of effective institutions (SDG 16) through indicator 16.6.1. This indicator is part of target 16.6 on developing "effective, transparent and accountable institutions at all levels," and measures "primary government expenditures as a proportion of original approved budget, by sector (or by budget codes or similar)."[2] In other words, it is meant to monitor the deviations between original resource allocations and actual expenditures in government budgets, looking not just at aggregate deviations, but at discrepancies across different ministries, sectors, or types of expenditure (e.g., recurrent vs. capital spending).[3]

2.1 PRIOR RESEARCH ON BUDGET CREDIBILITY

Past research on budget credibility is biased toward the credibility of aggregate revenue and expenditure. The literature on public financial management has recognized the challenges that governments face during budget execution for a long time (Caiden and Wildavsky 1980; Schick 1998) and highlighted how such challenges are likely

[2] See https://sustainabledevelopment.un.org/sdg16.

[3] Using originally approved budgets as the yardstick against which credibility is measured can be considered inadequate for poor countries with weak planning capacity and which are subject to frequent shocks. For the purposes of comparative analysis, however, this is about the only possible choice, as it provides a common starting point for all countries that using adjusted or modified budgets does not.

to result in actual budgets that differ substantially from originally approved ones (Rakner et al. 2004; Killick 2005; Andrews 2011). However, many of these studies are based on limited empirical analysis of detailed budget data.

In the field of public finance, there has been a focus on the credibility of broader fiscal policies, focused on the extent to which governments are able to stick to their declared fiscal policy goals (i.e., deficit and debt targets), often in the context of the application of fiscal rules or fiscal responsibility laws.[4] This research only looks at deviations in aggregate revenues and spending, and at their macroeconomic impact. Other research has also looked at the credibility of revenue projections, either across countries (Buettner and Kauder 2010) or across subnational units within a country (Couture and Imbeau 2009).

More detailed empirical research on budget credibility is very limited, and in most cases looks at individual countries only.[5] Ablo and Reinikka (1999) show how using budget allocations to study delivery of education services in Uganda can be highly misleading. A survey they carried out to track funding from the Ministry of Finance all the way to individual schools revealed that less than a third of funding intended for non-salary public spending actually reached the schools, due to weak governance and a lack of accountability.

Stasavage and Moyo (2000) show how the introduction of cash budgeting in Zambia and Uganda meant that there was "heavy reallocation of expenditures between different ministries. Some ministries have received much more than they were originally budgeted, while others have received substantially less" (p2106). This is associated, according to the authors, with the degree of flexibility that the finance ministry is given in implementing cash budgeting to avoid deficits, and with political pressures to increase spending in certain areas.

Williams (2015) looks at budget deviations at both aggregate level and ministry by ministry in Ghana, finding consistent aggregate overspending over a decade, and large deviations for non-personnel spending across ministries for the years 2009 to 2012. The drivers of ministries' budget performance are heterogeneous and often idiosyncratic, and not easily linked to various aspects of budget processes or outcomes, making it difficult to identify a clear set of factors linked to lack of budget credibility.

Finally, Simson and Welham (2014) look at the different steps in the budget execution chain that might result in deviations and analyze them through examples drawn from three African countries. They highlight the importance of investigating credibility at different levels, understanding the impacts that deviations can have not just on fiscal balances, but also on resource allocation and on public investments. Looking at the budgets of Uganda, Tanzania

[4] See, for example, Chapters 2 and 4 in Cangiano et al. (2013).

[5] Here we draw on research produced by academics and independent researchers. There is a large additional body of country-specific evidence on budget credibility contained in Public Expenditure Reviews produced by the World Bank over the years. To see a sample of such documents, see: http://documents.worldbank.org/curated/en/docsearch/document-type/904591.

and Liberia over the period 2007-2012, they find consistent aggregate underspending (often more than 10%), unevenly distributed allocations – with institutions like State House, Defense and Parliament consistently getting more money than key infrastructure ministries – and higher volatility for capital spending.

To our knowledge, there are only two studies that look at budget credibility across a larger number of countries. The first is part of a broader study of infrastructure investment in Sub-Saharan Africa (World Bank 2017) and looks at capital spending in infrastructure sectors (roads, electricity, water, etc.) across 26 countries in SSA over the period 2009-2015, using data from the BOOST dataset, which is the main source for the analysis in this paper as well. It finds that on average, governments execute less than 70% of their capital budget for infrastructure, underspending the equivalent of almost 1% of GDP, with roads accounting for two-thirds of that gap. Among the possible causes cited: inflated revenue projections that lead to in-year cuts in capital spending, inefficient procurement systems, pervasive corruption and weak accountability.

Addison (2013) was the first to exploit the richness of budget data from Public Expenditure and Financial Accountability (PEFA) assessments – another important source of budget credibility data – to look at budget deviations in 45 countries across the world, covering different 3-year periods depending on when the assessment was carried out. The findings show great variation in budget credibility, both across countries and over time, and large variations in the composition of spending, but without assessing which ministries gain or lose from such variation. Improving revenue projections, introducing reforms to limit common pool pressures and strengthening budget systems are all identified as possible strategies to deal with lack of budget credibility.

In sum, the way in which governments allocate and spend public resources is a very important factor in their efforts to promote socioeconomic development, but little is known about budget credibility at the global level (its nature or extent), and few studies examine the degree to which particular sectors are affected consistently by budget deviations. While in the past attention has focused mostly on how many resources governments allocated to key priority sectors – and on how many resources were missing for them to be able to achieve key objectives – it is important to also look at how credible they are – i.e., the extent to which governments stick to their plans. Existing evidence is still scarce, but points to major budget credibility challenges across countries.

3. OUTLINE AND DATA SOURCES

Our analysis relies on the BOOST dataset, created in 2010 by the World Bank "to facilitate access to budget data and promote effective use for improved decision-making processes, transparency and accountability."[6] The

[6] See http://boost.worldbank.org/. The full BOOST dataset at the moment includes about 60 countries, not all of which are fully public, and many of which have missing data. Time coverage varies across countries.

dataset brings together detailed and disaggregated expenditure data for a considerable number of mostly developing countries, either drawing on these countries' own budget transparency portals or on datasets produced by the government in collaboration with World Bank teams. Budget data include annual figures for the period between 2009 to 2017 (or a subset of those years) for both approved and executed budgets. In some cases, where actual disbursement or expenditure data are unavailable or incomplete, obligation or committed data are used instead for executed budgets.[7] BOOST datasets cover either the public sector as a whole, the general government sector – that is including both national and subnational spending (where relevant) – or just central government spending, broken down by a combination of functional, administrative and economic classifications.[8]

The detailed and disaggregated nature of BOOST data allow us to carry out a number of different analyses of budget credibility. In this paper, we first look at budget deviations at the aggregate level – i.e., for overall spending. To better understand some of the underlying dynamics of budget credibility, we then turn to what we call "compositional" credibility, looking at changes in the composition of spending during budget execution. To do this, we look at deviations across different types of spending, based on economic classification, i.e., whether money is being spent on salaries, purchase of goods and services, transfers, etc. or is being used for capital investments. Furthermore, we compare deviations across different sectors to see how each is affected by lack of budget credibility. This provides a prima facie assessment on which sectors are prioritized by governments vis-à-vis their spending. We delve deeper into some sectors which are particularly important for the SDGs (health, education and agriculture) to shed further light on what happens during budget implementation. Finally, we combine the two analyses to show how different types of spending vary within sectors, and we look at whether the patterns we observe across all country-years also hold within individual countries.

When we move from aggregate deviations to the economic or sectoral composition of spending, we mostly focus on "net" deviations – calculated as the deviation from the original budget for a specific item, say salaries or health spending, minus the deviation in aggregate spending – in order to capture the relative gains or losses for each budget item, which reflect choices that governments make independently of changes affecting the budget as a whole.[9] This means that often the net deviation figures that we show are smaller than the actual gross deviations.

[7] In our sample of 35 countries, there are 4 to 5 such cases. For example, in the Dominican Republic, accrued amounts are used instead of paid amounts because the latter data are not available for central government during the period 2014-2017. In the Dominican Republic, accrued and paid amounts were essentially equal (difference of less than 1%) for the central government over the period 2009-2013. Generally, however, using obligation or commitment data can underestimate budget deviations by failing to take into account challenges during the payment stage.

[8] An alternative source of data for budget credibility analysis are Public Expenditure and Financial Accountability (PEFA) assessments, which have been carried out for a large number of countries. However, these have shorter and more variable time coverage, and do not go into the same level of detail as BOOST. We have used them in some instances to check the robustness of our findings.

[9] For example, consider a situation in which health spending is executed at a rate of 105%, and the overall budget at 120%. While it may seem that a 5% overspend might be a signal of government favoring the health sector, it hides the fact that health is in effect heavily underspent, vis-à-vis at least some other sectors. The net deviation of -15% shows this relative loss.

In most cases, and for different categories of spending, we present both the size of net deviations – to give a sense of how much actual expenditures differ from originally approved ones – and the changes in the budget shares, as a way to show the impact that such deviation has on the overall budget. This is to take into account the fact that, for example, large deviations in small sectors (e.g., culture) may be less important than smaller deviations in large sectors (e.g., education).

Given our interest in looking at compositional credibility, we have selected a sample of 35 countries[10] for which detailed, credible and consistent budget classification systems were available. Economic classification is very common across countries and usually compliant with international standards, and therefore more easily comparable. Thus, our sample selection was mostly based on the availability of functional classification in line with the first tier of the UN Classification of the Functions of Government (COFOG), which identifies ten key functions corresponding to different sectors or areas of government intervention (see Table 1).

TABLE 1. CLASSIFICATION OF FUNCTIONS OF GOVERNMENT (COFOG)

Code	Function	*Sectors/Areas of intervention*
1	General Public Services	*Executive and legislative organs, financial and fiscal affairs, foreign aid, basic research, public debt, local government transfers, etc.*
2	Defense	*Military and civil defense, foreign military aid, etc.*
3	Public Order and Safety	*Police, fire protection, courts, prisons, etc.*
4	Economic Affairs	*Agriculture, forestry, fishing, energy, mining, manufacturing, transport, communications, etc.*
5	Environmental Protection	*Waste management, pollution control, protection of biodiversity and landscape, etc.*
6	Housing and Community Amenities	*Housing, community development, water supply, urban infrastructure, etc.*
7	Health	*Medical products and equipment, hospital services, public health services, etc.*
8	Recreation, Culture and Religion	*Sports, culture, broadcasting and publishing, etc.*
9	Education	*Primary, secondary, tertiary education, etc.*
10	Social Protection	*Support for disability, old age, children, unemployment, etc.*

Source: IMF Government Finance Statistics Manual (2011).

More than half of the countries in our sample use a functional classification that is identical or very close to COFOG. For the remaining countries, we had to regroup and reassign some items based on their nomenclature, to make the classification more consistent with the original COFOG one. For example, in Kenya we had to split the sector called "Environment Protection, Water and Natural Resources" using program-level data. Programs that

When we look at sub-sectoral spending, net deviations are calculated compared to deviations in the total sectoral budget, not the overall budget.

[10] The sample covers various regions and income levels. It includes 8 low-income, 10 lower-middle-income, 14 upper-middle-income, and 3 high-income countries. There are 12 countries from Sub-Saharan Africa, 10 each from the Latin America & the Caribbean and the Eastern Europe & Central Asia regions, 2 countries from East Asia & the Pacific, and one country from South Asia. See the Appendix Table for a full list.

were referred to as environmental in nature (e.g., "Environment Management and Protection") were assigned to the environmental protection function, while those that referred to housing development or water supply (e.g., "Housing Development and Human Settlement") were assigned to the housing and community amenities function. The rest – including irrigation, mineral resources management and rural electrification – were assigned to economic affairs. It is possible that we were not able to correctly assign all sub-programs, as some were only shown as numeric codes.

In limited cases, where a detailed functional classification was not available, we used administrative classification to assign funding for different government ministries or departments to corresponding government functions. In Uruguay, for instance, the sub-functional item closest to agriculture was labelled "productive development" ("Desarrollo Productivo"). To avoid counting expenditures that were not related to agricultural activities, we only considered items that fell under the administrative responsibility of the Ministry for Livestock, Agriculture and Fisheries ("Ministerio de Ganadería, Agricultura y Pesca"). Many such decisions were necessary, and such an approach did not always lead to easy and clear-cut choices. As a consequence, concerns with cross-country comparability and consistency remain an important limitation of the data used in this paper.[11]

4. OVERALL BUDGET CREDIBILITY AND THE COMPOSITION OF SPENDING ACROSS COUNTRIES

To assess the degree to which governments, on average, stick to their plans during budget execution, we use BOOST data to look at overall budget credibility over the period 2009-2017 across the 35 countries in our sample, for a total of 233 country/year observations. Table 2 summarizes the aggregate data. On average, budgets are underspent by a significant proportion (9.2%), and the variation is very large, spanning from -55.7% (Benin 2010) to +19.9% (Myanmar 2011). This indicates a significant budget credibility problem, suggesting that governments find it very difficult to implement budgets as originally planned, and that they often end up reducing spending over the course of the fiscal year, affecting service delivery and disrupting other government functions. If we create a country average by averaging budget deviations across available years for each country, the picture does not change substantially in terms of average deviations, even if the variance inevitably drops.

TABLE 2. OVERALL BUDGET CREDIBILITY STATISTICS (PERCENT)

	obs	mean	sd	min	med	max
Aggregate budget deviations	233	-9.2	14.0	-55.7	-7.0	19.9
Using country averages	*35*	*-8.8*	*11.2*	*-31.9*	*-8.2*	*8.0*

Source: BOOST dataset and authors' calculations.
Note: obs = number of observations; sd = standard deviation; min = minimum; med = median; max = maximum

[11] For more information about our approach to data cleaning and reclassification, contact Chloe Cho at ccho@internationalbudget.org.

BOX 1. BENIN AND MYANMAR: A CLOSER LOOK AT EXTREME LEVELS OF AGGREGATE BUDGET DEVIATIONS

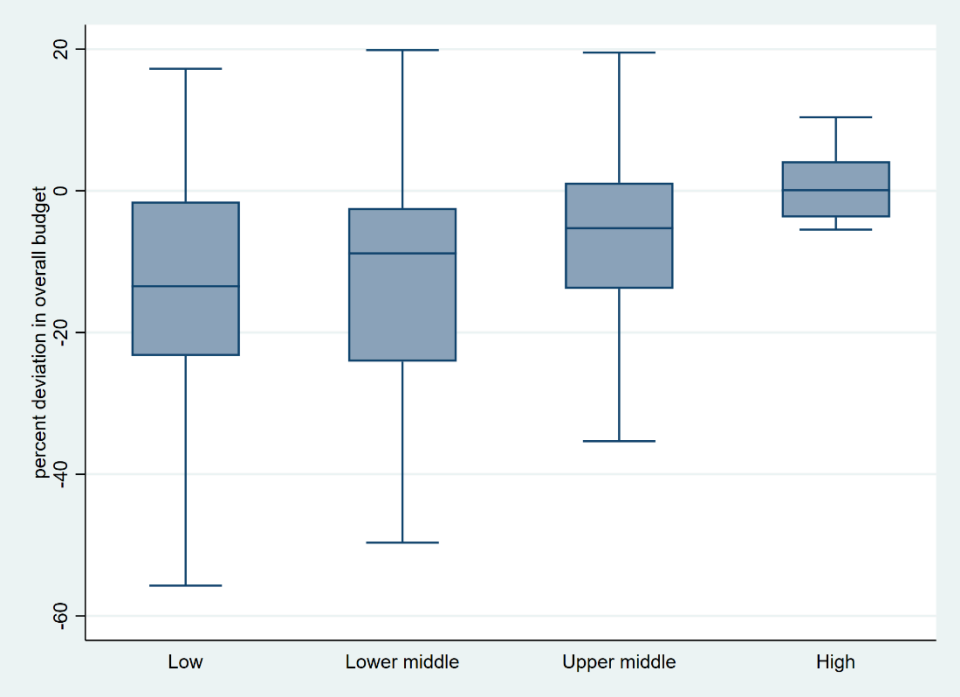
In 2010, the Government of Benin spent less than half of its originally approved budget. According to the Audit Report for that fiscal year, published by Benin's Chambre des Comptes, this dismal execution rate is mostly due to minimal execution of planned capital expenditure. The execution rate for recurrent spending was 83%, with slight overspending on personnel and underspending of about 20% for goods & services and transfers. On the side of capital spending, the execution rate was just 11% - 26% on domestically financed investment and a mere 2% on externally financed investment. The Audit Report cites a number of reasons for this, from the complexity of donor procedures to delays in procurement, and from lack of integration of donor spending into the country's IFMIS to the difficulty in complying with donor conditionalities. It is worth noting, however, that overall capital spending represented 56% of the originally approved budget, which may have been unrealistically large to be credible in the first place. Findings from more recent research conducted by Social Watch Benin, which focused on health spending over 2013-2017, reinforce this overall picture and suggest that credibility challenges are still present. Execution rates for the operating budget of the Ministry of Health often exceed 100%, while those for investment projects range from 38% to 53% – with even lower rates for externally financed projects.

In contrast, Myanmar overspent its budget by more than 10% in all years between 2009/10 and 2012/13. In 2010/11, the deviation was closer to 20%. The World Bank's 2015 Public Expenditure Review (PER) cites revenue surpluses as a reason for this. Collected revenues exceeded projected revenues by 0.9% - 1.8% of GDP over the period 2009/10-2012/13, with the highest deviation in 2010/11. The 2012 PEFA assessment – also produced by the World Bank – confirms this and shows that actual revenue collection was almost 118% of the original forecasted amount in 2010/11. In addition, the 2012 PEFA assessment suggests net financing as another "main cause of aggregate deviations," as new information regarding net financing can also lead to revisions in the budget. Both the PER and PEFA reports mention specific areas of the budget where overspending was most felt. The PER notes that "over-realized revenues financed extra, unbudgeted (mostly capital) spending." PEFA finds that ministries responsible for agriculture, construction, defense, finance and social welfare, as well as the state administrative organizations, overspent their budgets "well beyond what would have been reasonable after taking into account unexpected shocks to revenues and net financing." Meanwhile, ministries responsible for energy and for livestock were underspent in all 3 years during 2008/09-2010/11, which illustrate how not all areas of budget receive their fair share of additional revenues.

Sources: For Benin, République du Bénin (2012) and IBP (2019); For Myanmar, World Bank (2012, 2015).

Low- and lower-middle-income countries suffer from greater budget credibility problems, with larger underspending and broader variation. This could be related to several different factors, like weaknesses in budget planning and execution systems and procedures. Figure 1 presents the data on aggregate budget deviations in our sample, by country income level. We found that the extent of underspending lessened as country income level increased; the low-income countries in our study experienced aggregate budget deviations, on average, of -13.8%, lower-middle-income countries -12.8%, upper-middle-income countries -6.6%, and high-income countries averaged +0.3%. Also, as country income level rose, the large variation in budget deviations generally narrowed.

FIGURE 1. DEVIATIONS IN AGGREGATE SPENDING, BY INCOME LEVEL



Source: BOOST dataset and authors' calculations.

Our data also suggest, however, that external financing might play a role in the lack of overall budget credibility. In countries for which information on financing sources is available, average underspending is much larger for expenditures that are externally financed rather than funded from domestic sources. When external financing is excluded from the analysis, average overall deviation across the 35 countries drops to -5.6%. This figure is closer to budget credibility data from selected PEFA assessments, which show a much smaller average deviation at -2.8%.[12]

[12] We use PEFA assessments released since 2012, which provide data for more than 90 countries and 335 country/years over the period 2009-2017.

The difference is partly due to PEFA's coverage, which is limited to central government and primary expenditures but also to the fact that before the introduction of the 2016 PEFA framework, PEFA data excluded all donor-funded project expenditure. For example, data from PEFA assessments show that the government of the Solomon Islands in 2010 overspent its overall budget by 3.7%. Yet, BOOST data suggest that it was underspent by 42.1%. This is largely because donor-funded projects were underspent by more than 90%. If those are excluded, we get the same deviation in both datasets. Likewise, the average deviation for 22 countries in our sample covered by both BOOST and PEFA is -12.6% according to BOOST, but -6.2% if we exclude foreign financing – much closer to the -5.0% deviation calculated from PEFA data.

Understanding when or how external financing aggravates overall budget credibility in aid-dependent countries will require further analysis, but two possible factors can be considered important here. The first one relates to problems of unpredictability and volatility of aid flows, which have been recognized and studied before.[13] If donors' budgets are not credible – i.e., if donors do not deliver on their funding promises – this will inevitably have an effect on the credibility of recipient governments' budgets, as far as donor funding is fully reflected in the government's own budget systems. The second one is linked to the fact that information on donor-funded projects and activities is not always well captured in the budget systems of aid-recipient countries and, if anything, its coverage is usually more complete during budget formulation than in the execution and reporting stages of the budget cycle.[14] Therefore, unless reporting arrangements are improved, external financing is likely to result – or appear to result – in lower budget credibility.

Deviations in aggregate spending are clearly important as an indicator of the overall capacity of governments to deliver on planned budgets. In order to better understand what happens during budget implementation, however, and the differential impact that lack of budget credibility has on different types of spending, it is necessary to look at disaggregated data. In the following pages, we look at variations in the composition of spending based on economic and functional classifications. We show results for each separately first, and then combine the two.

4.1 BUDGET DEVIATIONS BY ECONOMIC CLASSIFICATION

In line with previous research on the topic of budget credibility, our main finding is that average underspending is much larger for capital spending, which involves complex procedures, including procurement for large investment projects, and which are more easily reduced, delayed or cancelled. Capital budget is underspent by an average of

[13] See, for example, Celasun and Walliser (2008) and Kodama (2012).
[14] See Moon and Williamson (2010) and Ramkumar and de Renzio (2009).

17.7%, compared to 4.3% for the recurrent budget – which mostly consists of obligatory spending for salaries, pensions, etc.

To get a sense of how the composition of spending varies above and beyond the under or overspending of overall budgets, we looked at variations in spending by economic classification, calculating them net of aggregate variations (see Table 3). Average net deviation is large and negative for capital spending (-8.5%), and lower and positive for recurrent spending (+4.8%). This implies that no matter how credible the overall budget, governments tend to spend relatively more on recurrent items while they reduce capital spending, which may have a long-term effect on their capacity to achieve improved development outcomes. Some countries show very large variations in items that are not easily classified as either recurrent or capital, which often consist of contingency reserves or financial operations of different kinds, but these items usually represent a very small share of the total budget.

TABLE 3. NET DEVIATIONS BY ECONOMIC CLASSIFICATION (PERCENT, EXCEPT FOR THE NUMBER OF OBSERVATIONS)

	obs	mean	sd	min	med	max
Recurrent spending	233	**4.8**	8.6	-23.5	3.6	47.5
Wage bill	*227*	*8.2*	*14.5*	*-36.1*	*5.7*	*57.6*
Goods & services	*233*	*0.0*	*15.9*	*-42.2*	*-1.8*	*64. 3*
Interest payments	*229*	*4.5*	*26.3*	*-73.4*	*-0.1*	*124.9*
Other recurrent	*233*	*5.2*	*16.2*	*-39.8*	*3.9*	*81.1*
Capital spending	*233*	***-8.5***	*20.5*	*-47.5*	*-11.0*	*131.0*
Other (reserve, etc.)	82	-8.4	458.4	-1,902.1	-12.3	3,126.7

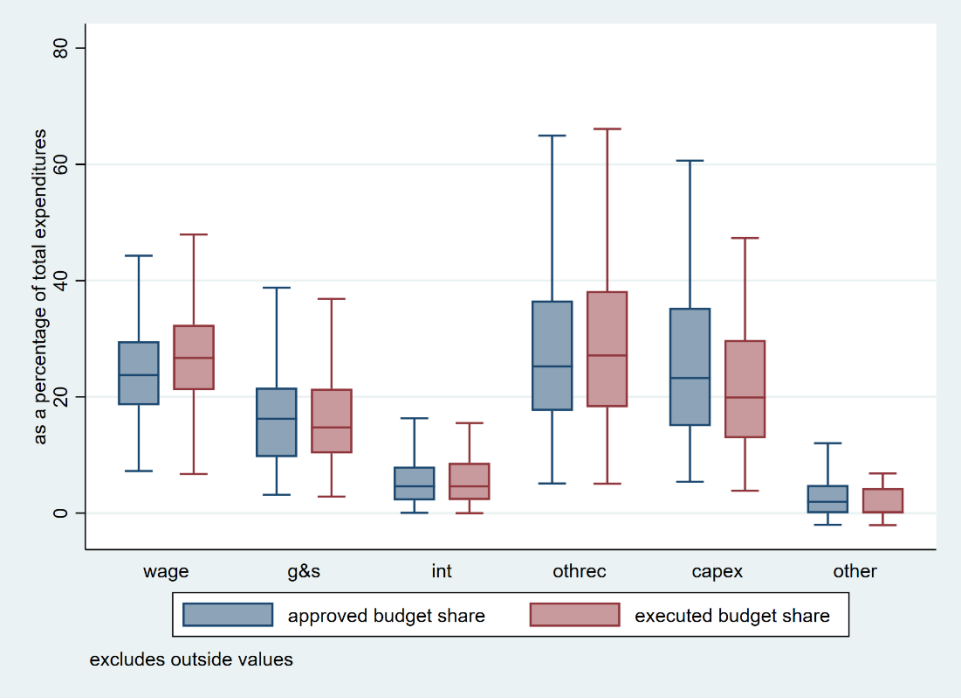
Source: BOOST dataset and authors' calculations.
Note: obs = number of observations; sd = standard deviation; min = minimum; med = median; max = maximum

Looking at items of recurrent spending in more detail, we see that the two categories that benefit the most, on average, from the shifting of resources during budget execution are the compensation of civil servants (+8.2%) and payments related to interest on government debt (+4.5%), although the value here may be skewed by positive outliers.[15] Transfers, benefits and subsidies of various kinds – including pensions and transfers to local governments – which fall under the "other recurrent" expenditure category also tend to gain (+5.2%).

[15] For example, Angola's interest payments almost doubled from Kz. 57.4 billion to 101.7 billion in 2009 (from under 2% to almost 7% of the total expenditures); as the overall budget was underspent by almost 50%, the net deviation shows as 124.9%. Excluding outliers, including this observation, average net deviation for interest is just under 1%. There were also cases like Albania in 2014, in which interest payments were missing in the approved budget but amounted to Lek. 40 billion of actual spending (more than 10% of the executed budget).

Clearly, the relevance of the variations shown above depends on how much each of the items weighs on the total budget. Figure 2 shows data again broken down by economic classification, but rather than report on the deviations between approved and executed budgets, it presents the changes in the share of the total budget that each item represents at both the approved and executed stages of the budget cycle. Interest payments and the category referred to as "other" represent small shares of the total budget, so even large deviations will have a limited impact on overall spending patterns. For the larger economic categories of spending, on average the share of spending on salaries and transfers/subsidies increased by a few percentage points, with the latter representing more than 50% of total budget in some countries. On the other hand, the share of spending dropped for goods & services and, more markedly, for capital investment, which decreased by almost 3 percentage points on average. While it seems reasonable that governments need to honor their statutory commitments to pay salaries and pensions before spending on road construction, constantly undermining the investments necessary to boost growth and expand the government's capacity to deliver services will undoubtedly affect the development prospects of a country.

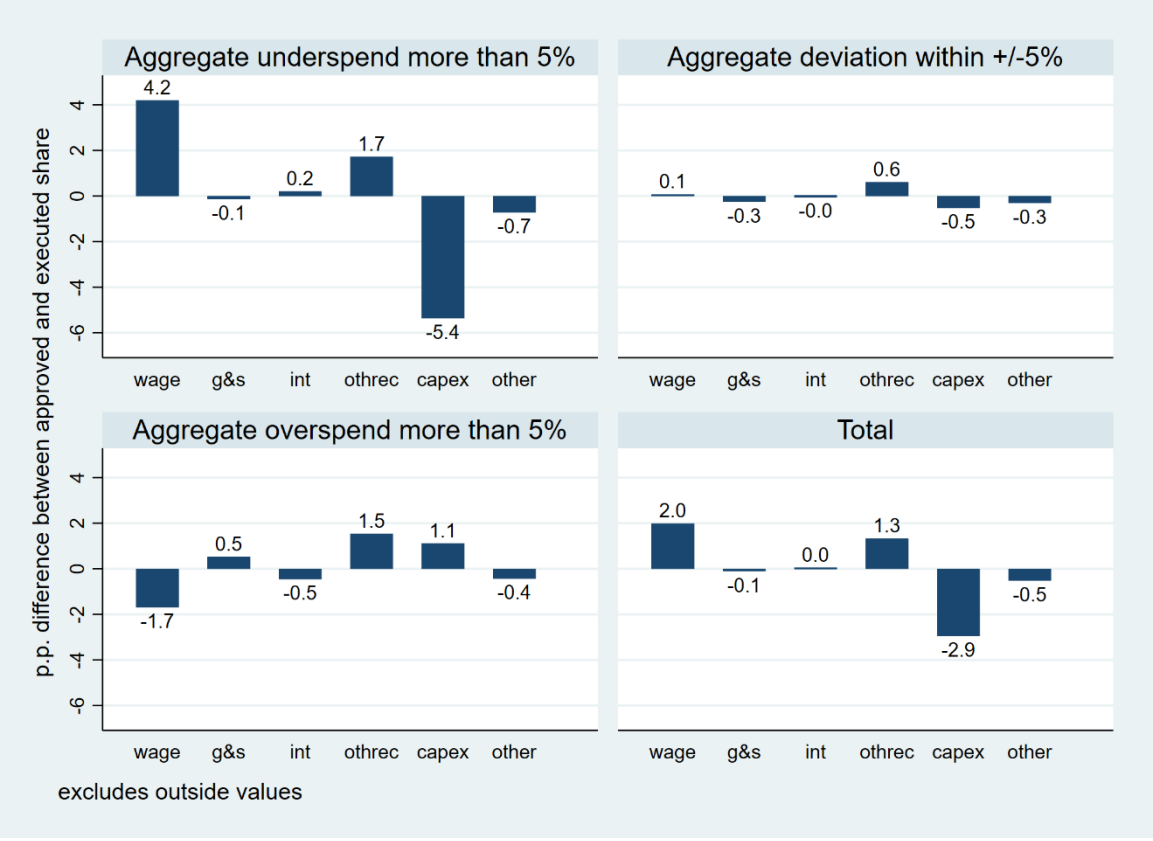
FIGURE 2. APPROVED AND EXECUTED BUDGET SHARES BY ECONOMIC CLASSIFICATION (EXCLUDING OUTLIERS)



Source: BOOST dataset and authors' calculations.
Note: g&s = goods & services; int = interest; othrec = other recurrent spending; capex = capital expenditure

If we look separately at instances where the overall budget was overspent vs. underspent, and at whether such over/under spending was large or small, we can see that capital spending suffers most when aggregate deviations are negative and larger than 5% (Figure 3). In such cases, the share of spending on capital investments decreased by 5.4 percentage points on average, compared to the share on compensation, which increased by 4.2 percentage points – all excluding outliers. When aggregate deviations are kept within ±5%, variations are much smaller, though capital spending is still negatively affected (by 0.5 percentage points on average). It is only when overall budgets are overspent by more than 5% that the picture changes, with the relative share of spending on salaries going down by 1.7 percentage points, and additional resources being spent on increasing transfers and subsidies and capital investment, which increase by over 1 percentage point each.

FIGURE 3. SHIFTS IN BUDGET SHARES BY ECONOMIC CLASSIFICATION FOR VARIOUS AGGREGATE DEVIATION SCENARIOS (EXCLUDING OUTLIERS)



Source: BOOST dataset and authors' calculations.
Note: g&s = goods & services; int = interest; othrec = other recurrent spending; capex = capital expenditure

Similar and important differences can also be seen if we look at changes in budget shares across countries at different levels of income (Figure 4). Relative overspending on wages and transfers is highest for low-income countries and gradually decreases as countries become richer. Similarly, the reduction to the relative share of the

budget that is spent on capital investment in low-income countries is large (7.1 percentage points on average, again excluding outliers) but is negligible (only 0.2 percentage points) in high-income countries.

FIGURE 4. SHIFTS IN BUDGET SHARES BY ECONOMIC CLASSIFICATION, BY COUNTRY INCOME LEVEL (EXCLUDING OUTLIERS)

Source: BOOST dataset and authors' calculations.
Note: g&s = goods & services; int = interest; othrec = other recurrent spending; capex = capital expenditure

4.2 BUDGET DEVIATIONS BY FUNCTIONAL CLASSIFICATION

Turning our attention to what happens with sectoral spending, we now look at how the distribution of spending changes across various key government functions during budget execution – again, above and beyond aggregate deviations. Examining functional classification is particularly important when thinking about development outcomes, as several government functions are directly linked to service delivery areas that contribute to the SDGs and to improvements in development indicators.

The results are shown in Table 4; the number of actual observations is affected by the availability or reliability of functional classification for each category in the 35 countries in our sample. For example, due to problems with the relevant data, deviations for environmental protection and housing cannot be calculated for Afghanistan, and because Kenya provides no data on actual spending on defense, the country is excluded from calculations on that sector. In fact, many countries either do not report on, or did not agree to make information on their levels of defense spending public as part of the BOOST database, which is reflected in the much smaller number of observations for defense than for other sectors in Table 4.

TABLE 4. NET DEVIATIONS BY FUNCTIONAL CLASSIFICATION (PERCENT, EXCEPT FOR THE NUMBER OF OBSERVATIONS)

	obs	mean	sd	min	med	max
General public services	232	2.1	15.8	-35.1	0.7	123.1
Defense	102	12.6	34.9	-22.5	5.7	285.0
Public order & safety	232	4.0	15.4	-71.8	3.2	62.7
Economic affairs	232	-6.1	16.7	-45.3	-7.8	90.3
Environmental protection	223	-13.2	27.3	-85.1	-9.3	69.3
Housing & community amenities	227	-10.6	36.6	-87.6	-9.3	306.4
Health	232	-0.9	14.1	-52.4	0.2	64.6
Recreation, culture & religion	224	4.3	34.6	-66.7	-0.1	239.4
Education	232	2.8	11.2	-27.2	1.6	42.4
Social protection	231	11.1	37.2	-48.5	3.9	338.3
n/a	92	6.6	52.0	-93.7	-0.2	317.1

Source: BOOST dataset and authors' calculations.
Note: obs = number of observations; sd = standard deviation; min = minimum; med = median; max = maximum

From our review of average deviations, then, the key findings can be summarized as follows:

1. The sectors that gain most in relative terms, experiencing the largest average positive deviations, are defense (+12.6%) and social protection (+11.1%)[16]

2. Two other sectors that see significant increases in their funding are culture (+4.3%) and public safety (+4.0%). General public services experience a positive but smaller deviation (+2.1%).

[16] These are the only two sectors that experience average positive gross deviations as well, of 6.1% and 1.9% respectively.

3. Education also sees a positive deviation (+2.8%), while the average overall deviation in the health sector is negative, although small (-0.9%).

4. The sectors that tend to lose out most during budget execution are economic affairs (-6.2%), environment (-13.2%) and housing (-10.6%).[17]

However, these findings need to be interpreted very carefully. A striking feature of the data in Table 4 is the evidence of very large variations in sector deviations across the sample, indicating how much sector spending can change and shift during budget execution – something that is not readily obvious in the aggregate deviation figures for the overall budget. Thus, we see that even in sectors that, on average, were overspent, there are cases where funding was cut by more than a third (e.g., general public services) or by more than two thirds (e.g., public safety and culture) in certain years. The extent of shifting that occurs highlights how the lack of budget credibility can wreak havoc on sector planning, given the high degree of uncertainty about what share of the approved funding will end up being available for each sector.

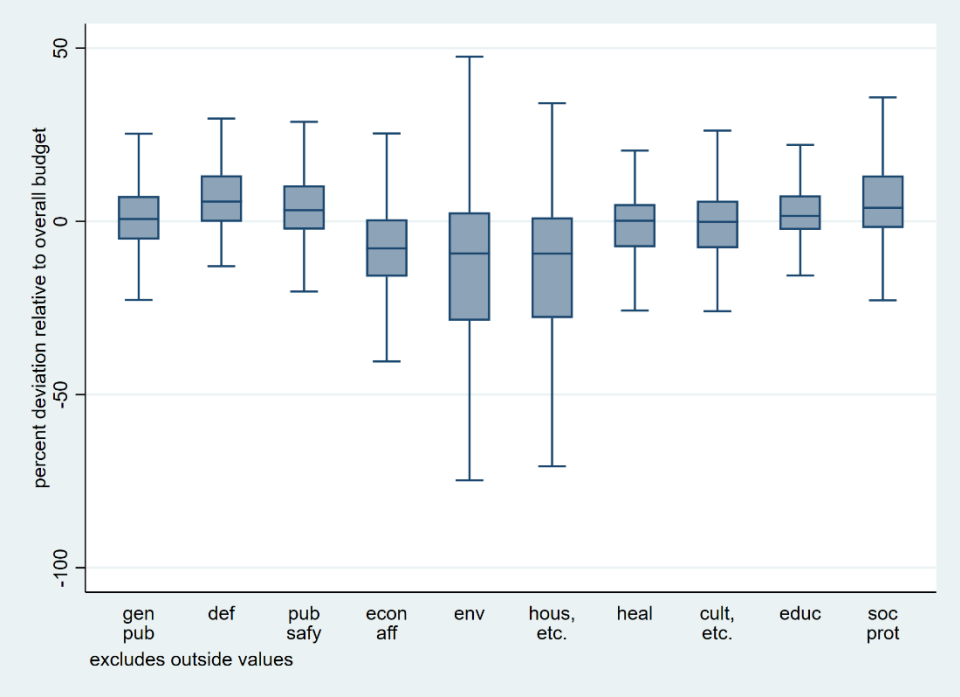
In more extreme instances, funding was virtually cancelled, especially in sectors that suffer from overall underspending. In Burkina Faso, for example, funding for housing and community amenities was reduced by 89.1% in 2009; as the overall budget deviated by only about 2%, this represented a net deviation of -87.6%. In São Tomé and Príncipe, the same function was underspent by 93.1% in 2016 – but net deviation was smaller compared to Burkina Faso, as the overall budget deviation was also large at -45.0%. On the opposite side, the same sector in Ecuador was overspent by more than 300% in 2012. Funding for housing and community amenities seems to fluctuate often and substantially in Ecuador, with net deviations ranging from -30.7% to +116.2% in other years.

Such dramatic variations across countries significantly skews the data, as shown by the large differences between mean and median values for many sectors, but most notably for culture, which would see a negative deviation if extreme cases were excluded. Defense and social protection would also see much smaller increases.

If we exclude outliers and present the data in a box plot graph (Figure 5), the relative gains of the defense, public safety and social protection sectors are more evident, as are the relative losses of the economic affairs, environment and housing sectors, which also show larger variations.

[17] Looking at average gross deviations, these sectors are all underspent by more than 15%.

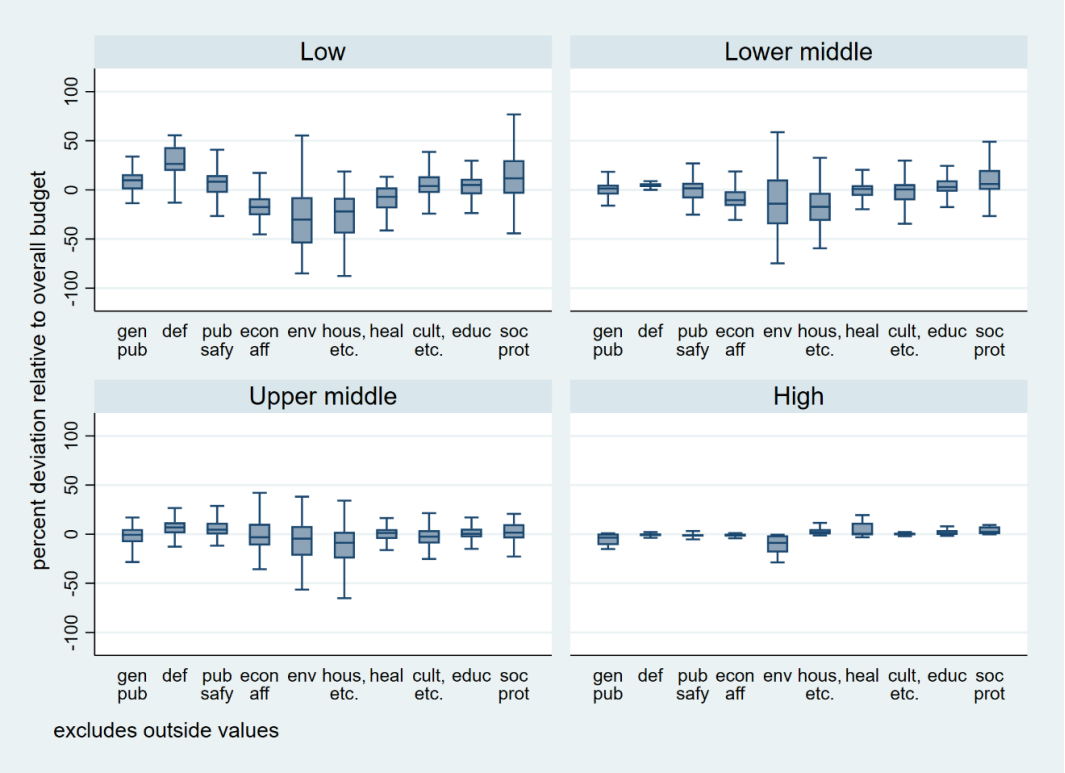
FIGURE 5. NET DEVIATIONS BY FUNCTIONAL CLASSIFICATION (EXCLUDING OUTLIERS)



Source: BOOST dataset and authors' calculations.
Note: gen pub = general public services; def = defense; pub safy = public order & safety; econ aff = economic affairs; env = environmental protection; hous, etc. = housing & community amenities; heal = health; cult, etc. = recreation, culture & religion; educ = education; soc prot = social protection; n/a not shown

The same data can be analyzed by countries with different levels of national income, to see whether deviations look similar in richer vs. poorer countries (see Figure 6).

FIGURE 6. NET DEVIATIONS BY FUNCTIONAL CLASSIFICATION, BY INCOME LEVELS (EXCLUDING OUTLIERS)



Source: BOOST dataset and authors' calculations.
Note: gen pub = general public services; def = defense; pub safy = public order & safety; econ aff = economic affairs; env = environmental protection; hous, etc. = housing & community amenities; heal = health; cult, etc. = recreation, culture & religion; educ = education; soc prot = social protection; n/a not shown

Some of the trends described above are much more evident in low- and lower-middle-income countries: not only are deviations much larger but shifts in budget shares during execution are much more accentuated, with median values further away from the 0 line. More generally, average net deviations across sectors are much smaller in high- and upper-middle-income countries – from -7.7% in environmental protection to +5.1% in defense – compared to -29.4% in environmental protection and +51.0% in defense in low-income countries. Looking in more detail at some of the larger sectors that are particularly important for the SDGs in low-income countries, the picture is mixed. Education and social protection reassuringly seem to do relatively well, gaining additional resources during budget execution compared to other sectors. On the other hand, health does worse in low-income than in better-off countries, with an average net deviation of -8.0% compared to +0.6% in high- and upper-middle-income countries. The same is true for economic affairs, a key area for economic growth which is linked to several different SDGs, which on average sees funding reduced by net deviation of 16.6% in low-income countries and by 0.4% in high- and upper-middle-income countries.

These trends can also be seen in Table 5, which presents shifts in budget shares rather than in net deviations, allowing us to assess the weight that should be given to the relative gains and losses across sectors. Looking at the actual size of budget shares, and at how composition of the overall budget shifts during budget execution, the picture becomes somewhat clearer. With the usual caveat that looking at mean values can – and does – hide great variation, the large deviations seen above in spending on environment and housing lose part of their importance given the small shares of the overall budget that they affect. The positive gains that remain important are those in social protection (5.1% increase in budget share on average) and defense (15.8% increase). The decrease in the share of funding going to economic affairs, however, is probably the single most important finding from this analysis. On average, the share of the overall budget dedicated to economic affairs, which includes vital investment in agriculture, energy and roads, for example, drops from 21.1% to 18.9% – a 10.4% drop – between the beginning and the end of the fiscal year; this is even more pronounced in low-income countries, where the share going to the function drops by 20.8% on average

TABLE 5. APPROVED AND EXECUTED BUDGET SHARES BY FUNCTIONAL CLASSIFICATION (PERCENT)

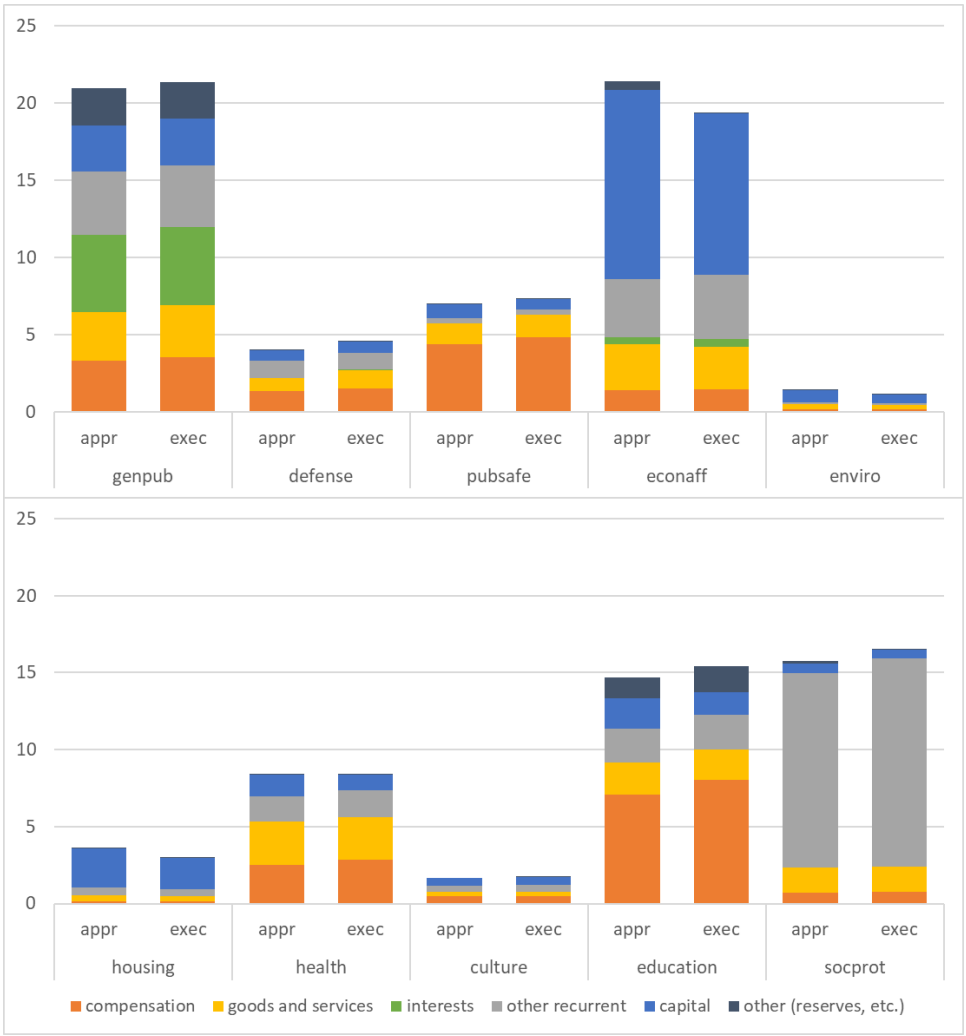
		mean	sd	min	med	max
General public services	appr	20.6	8.9	4.9	21.5	46.2
	exec	21.0	9.4	5.2	21.1	46.7
Defense	appr	3.8	3.9	0.3	2.5	16.3
	exec	4.4	4.6	0.3	2.6	24.5
Public order & safety	appr	6.9	3.5	1.3	6.9	31.9
	exec	7.2	3.5	1.3	7.3	22.2
Economic affairs	appr	21.1	10.3	5.7	19.1	65.8
	exec	19.0	9.7	5.7	17.1	55.5
Environmental protection	appr	1.4	1.4	0.0	0.9	6.8
	exec	1.1	1.3	0.0	0.7	6.0
Housing & community amenities	appr	3.6	2.3	0.1	2.9	10.4
	exec	2.9	2.1	0.1	2.4	10.2
Health	appr	8.5	3.3	0.9	8.9	19.5
	exec	8.4	3.6	0.9	8.8	21.7
Recreation, culture & religion	appr	1.7	1.3	0.0	1.2	6.8
	exec	1.7	1.4	0.0	1.4	7.3
Education	appr	14.5	4.5	3.7	14.9	25.7
	exec	15.2	5.0	3.7	15.1	27.6
Social protection	appr	15.7	13.0	0.5	13.5	67.0
	exec	16.5	13.9	0.4	14.2	73.4
n/a	appr	4.5	6.3	-0.3	1.6	20.7
	exec	5.2	7.5	-0.4	2.2	34.7

Source: BOOST dataset and authors' calculations.
Note: appr = approved; exec = executed; sd = standard deviation; min = minimum; med = median; max = maximum

4.3 LOOKING AT ECONOMIC AND FUNCTIONAL CLASSIFICATION TOGETHER

To further explore the nature of these changes, we look at data that brings together the two kinds of analyses presented above on economic and functional classifications. Figure 7 shows the changes in average shares for each sector in the overall budget between approved and executed budgets but adds in the composition of spending for each sector based on economic classification.

FIGURE 7. APPROVED AND EXECUTED BUDGET SHARES BY FUNCTIONAL AND ECONOMIC CLASSIFICATION (PERCENT)



Source: BOOST dataset and authors' calculations.
Note: genpub = general public services; pubsafe = public order & safety; econaff = economic affairs; enviro = environmental protection; housing = housing & community amenities; culture = recreation, culture & religion; socprot = social protection; n/a not shown; appr = approved; exec = executed

For each sector, then, we can see not just whether budget shares increased or decreased, but also if these shifts were due, for example, to increases in recurrent or capital spending, etc. The picture that emerges provides additional details and nuance to the findings already presented. Increases in budget shares – for general public services, defense, public safety or education, for example – are almost always due to increases in the wage bill, except for social protection, where the increase, as expected, mostly relates to transfers and subsidies. The decrease in budget shares for economic affairs and housing, on the other hand, is almost entirely linked to reductions in capital spending. Capital spending also seems to get squeezed during budget execution in both the health and education sectors, even as the wage bill increases.

In other words, the data indicate that governments across our sample of countries suffer from several inter-related budget credibility problems, which can be summarized as follows:

1. Governments tend to significantly underspend on their approved budgets.

2. Governments shift significant resources across functions and types of spending during budget execution in ways that favor certain sectors and activities and undermine others. Sectors with large shares of mandatory spending like salaries and transfers – for example education, public safety and social protection – tend to benefit in comparison to other sectors where capital spending is predominant. The latter includes mostly economic sectors, but to some extent also health.

3. These trends are more accentuated in lower-income countries.

These findings, coupled with the fact that defense and general public services also gain additional resources during budget execution, provide a useful snapshot of the technical and political challenges that countries across the world – and low-income ones, in particular – face in effectively responding to the SDGs. Siphoning resources away from capital investment in economic sectors to pay for recurrent spending obligations could be considered a poor policy choice given the need for economic growth to tackle persistent poverty.

4.4 BUDGET DEVIATIONS IN SPECIFIC SUB-SECTORS

As highlighted earlier, some sectors are particularly important for development, service delivery, and the SDGs. In this section, we take a closer look at spending on economic affairs, health and education to see what happens within each one of these sectors during budget execution and to learn to what extent governments shift resources around within specific sectors as well. Unfortunately, as we get more specific in our analysis of sub-sectors – or sub-functions, in this case – we face more severe data limitations. Fewer countries consistently provide a breakdown of budget information by sub-function, and issues of comparability become more evident, as not all

countries classify sub-functions in the same way. Moreover, some observations are clearly outliers that tend to skew data in ways that are not always easily explainable. Therefore, this analysis should be regarded as preliminary and incomplete, and in need of further probing and in-depth country verification.

The government function labelled economic affairs includes several important areas of government intervention, which are linked to a number of the SDGs. We examine a few that are classified somewhat consistently across countries: (a) agriculture – which includes forestry and fishing; (b) fuel & energy – which includes oil & gas and electricity; and (c) transport – which includes road, rail, water and air transport. Other spending on economic affairs – including mining, manufacturing, tourism, communication, labor affairs, etc. – is all bundled together as it is not consistently classified across countries.

The data in Table 6 show that agriculture – a sector that accounts for around 18% of total spending on economic affairs – loses the most in relative terms, experiencing an average net reduction of 2.5% (excluding outliers).[18] The transport sector, on the other hand, sees its overall resources increase by 1.4% on average (also excluding outliers), reaching a share of about 38% of total spending on economic affairs. Again, these averages hide very large variations, but in all cases the largest reductions can be seen in capital spending – albeit with a much smaller one in the transport sector – while recurrent spending always sees an increase. This again demonstrates how governments have difficulties prioritizing and delivering on capital investment promises even in economic sectors where they are particularly important and where they could generate significant benefits.

[18] To calculate actual average deviation, this figure would have to be added to the overall negative deviations for the economic affairs function as a whole. That is, on average, 17.7% of agriculture budgets are not spent. Net of aggregate deviations, this represents a relative underspending of 8.5% – and, net of deviations for economic affairs, underspending of 2.4% (or 2.5% excluding outliers, as shown in Table 7). As expected, the difference between the two figures equals the average net deviation for economic affairs shown in Table 4 (-6.1%).

TABLE 6. NET BUDGET DEVIATIONS BY ECONOMIC AFFAIRS SUB-FUNCTIONS AND ECONOMIC CLASS (EXCLUDING OUTLIERS)

	obs	mean	sd	min	med	max
Agriculture, etc.	221	-2.5	18.1	-48.0	-1.2	45.7
Recurrent	208	1.2	20.3	-49.9	-0.2	50.8
Capital	210	-11.9	20.8	-64.6	-9.9	39.3
Fuel & energy	204	-1.7	22.3	-53.8	-1.3	59.0
Recurrent	195	4.6	27.6	-57.9	2.5	73.0
Capital	203	-14.5	27.0	-81.8	-11.2	57.7
Transport	209	1.4	16.3	-41.1	0.9	43.9
Recurrent	199	3.8	19.3	-47.7	3.8	43.7
Capital	209	-2.7	22.1	-59.2	-3.3	59.9
Other econ. affairs	210	-5.4	19.4	-57.4	-1.5	38.2
Recurrent	209	3.7	21.4	-46.0	3.0	57.4
Capital	200	-11.2	25.2	-73.7	-10.1	56.7

Source: BOOST dataset and authors' calculations.
Note: obs = number of observations; sd = standard deviation; min = minimum; med = median; max = maximum; agriculture, etc. = agriculture, forestry, fishing & hunting; other econ. affairs = other economic affairs subfunction, including general economic, commercial & labor affairs and mining, manufacturing & construction

BOX 2. WHAT DO WE KNOW ABOUT IRRIGATION SPENDING ACROSS COUNTRIES?

Of the three specific areas we look at within economic affairs, the agriculture budget is the hardest hit by low credibility. Within agriculture, for the 13 countries where data are available, we find that the extent of underspending tends to be greater for irrigation than for agriculture as a whole. In our subsample, irrigation budgets are underspent by 16.0% on average – compared to 8.5% for the agriculture sector as a whole and less than 3% for both economic affairs and total government expenditure. This is likely a drag on the achievement of sustainable development, since irrigation investment is associated with higher productivity and more diverse cropping patterns that may help to reduce poverty.

TABLE B-2. AVERAGE BUDGET DEVIATION FOR IRRIGATION, AGRICULTURE, ECONOMIC AFFAIRS AND TOTAL GOVERNMENT EXPENDITURE (PERCENT)

Country	Years	Irrigation	Agriculture	Econ affairs	Aggregate
Albania	2010-2017	-26.6	-19.9	-18.4	-15.1
Armenia[1]	2009-2017	11.9	9.9	5.5	1.4
Brazil	2009-2016	-76.7	-49.0	-27.2	-14.1
Cameroon	2014-2015	-58.7	-12.0	-20.4	-6.1
Dominican Republic[2]	2009-2016	-1.8	0.1	27.5	1.6
Kenya	2014-2017	-35.2	-19.9	-18.0	-14.6
Kyrgyz Republic	2011 only	-3.3	-4.7	-5.2	3.2
Mexico	2009-2016	-14.3	-3.7	12.2	5.9
Moldova	2009-2015	-0.9	5.3	-7.7	-2.6
Mozambique	2009-2017	-59.2	-37.8	-32.2	-8.8
Myanmar	2010-2017	26.3	18.3	-0.2	5.0
Peru	2009-2016	18.7	13.1	29.4	6.7
Tajikistan	2010-2011	-12.6	-20.4	14.6	4.6
Average using country year	**2009-2017**	**-16.0**	**-8.5**	**-2.4**	**-2.7**
Average across countries	***2009-2017***	***-17.9***	***-9.3***	***-3.1***	***-2.5***

[1] Deviations shown are positive mostly due to 2017, when capital expenditure was overspent by more than 140%.
[2] Looks at deviation in transfers from the central government to the institute responsible over the period 2009-2013 (average deviation of +27.6%) and then in actual expenditure by the institute over 2014-2016 (-50.8%).

Not surprisingly, we find that capital expenditure within irrigation is underspent even more, by 22.2% – compared to 3.4% for recurrent expenditure (excluding outliers). In the Dominican Republic, the program "construction and rehabilitation of dams" was underspent by 96.1% over the period 2014-2016. Donor financing also plays a role in countries like Mozambique, where in 2016 external investment expenditure accounted for more than 80% of the total irrigation budget and was underspent by 100%.

It is difficult to establish a direct link between financial and nonfinancial performance, as data on both sides are rarely consistent across budget documents or available at the project level. Regardless, in countries like Albania, Kenya and Mozambique, we find evidence that issues relating to procurement and budget execution can impede implementation of irrigation projects and, in turn, achievement of nonfinancial targets in the agriculture sector.

Sources: Budget data from BOOST and República de Moçambique (2017).

In the **health** sector, data are available for a smaller number of countries, and with less consistency across countries in the areas covered within the sector, calling comparability into question. As shown in Table 7, the areas that seem to suffer the largest reductions in spending are medical products, which includes the purchase of medicines – but which represents a small portion of total health spending, around 3% on average (excluding outliers) – and public health services, which includes services like health monitoring, health information campaigns, etc. The area that gains more in relative terms is outpatient services, which covers general and specialized medical assistance provided in clinics, health posts, etc. Interestingly, underspending for capital expenditure seems to be much more pronounced in the health sector than in the economic sectors seen above, even though they represent a smaller share of total sector spending.

TABLE 7. NET BUDGET DEVIATIONS BY HEALTH SUB-FUNCTIONS AND ECONOMIC CLASS (EXCLUDING OUTLIERS)

	obs	mean	sd	min	med	max
Medical products, etc.	89	-8.0	26.5	-75.1	-7.6	56.7
Recurrent	85	-0.8	31.6	-81.7	1.2	75.5
Capital	69	-29.2	41.5	-103.3	-31.8	85.3
Outpatient services	88	6.9	21.6	-46.9	4.6	56.8
Recurrent	77	8.4	18.3	-36.8	6.2	45.4
Capital	58	-2.5	55.9	-88.7	-8.7	165.2
Hospital services	112	-0.8	10.5	-29.0	0.6	21.1
Recurrent	103	6.1	14.0	-28.2	3.6	42.6
Capital	107	-20.1	31.9	-84.4	-23.1	61.9
Public health services	134	-4.5	20.7	-58.4	-2.3	47.5
Recurrent	118	4.4	18.5	-38.8	1.8	47.2
Capital	106	-21.5	30.4	-81.1	-22.4	50.2
Other health	129	-4.7	14.8	-40.6	-2.9	26.0
Recurrent	113	3.8	14.6	-29.0	1.8	39.4
Capital	121	-23.4	29.4	-86.7	-22.5	46.0

Source: BOOST dataset and authors' calculations.
Note: obs = number of observations; sd = standard deviation; min = minimum; med = median; max = maximum; medical products, etc. = medical products, appliances & equipment

BOX 3. WHAT DO WE KNOW ABOUT IMMUNIZATION SPENDING ACROSS COUNTRIES?

Immunization prevents an estimated 2 to 3 million deaths every year at the global level and is a highly cost-effective public health intervention. Yet, while many countries commit to universal immunization coverage on paper, there is substantial evidence of underspending of immunization budgets from a sample of 22 countries covered by the World Bank's BOOST data.

Relying mostly on administrative or programmatic classification and on their nomenclature, we identified immunization-related line items in each of these countries. While unlikely to be comprehensive, our analysis captures a critical part of immunization financing. It also relates mostly to acquisition of goods and services, where vaccine purchases tend to be located. We find that the selected line items in our sample are underspent by roughly 30% on average and severely underspent relative to health in half of the countries.

TABLE B-3. AVERAGE BUDGET DEVIATION FOR IMMUNIZATION (SELECTED ITEMS ONLY), HEALTH AND TOTAL GOVERNMENT EXPENDITURE (PERCENT)

Country	Years	Immunization	Health	Aggregate
Afghanistan	2012-2016	-27.4	-29.7	-26.6
Angola	2009-2016	-18.8	-32.1	-17.1
Argentina	2010-2016	-2.9	-5.0	-3.9
Armenia	2010-2017	14.5*	-1.7	1.9
Benin	2009-2016	-73.9	-44.3	-28.7
Burkina Faso	2009-2015	-25.4	-37.8	-5.4
Cameroon	2014-2015	-8.3	15.0	-6.1
Costa Rica	2009-2016	-31.9	-7.4	-10.2
Dominican Republic	2016 only	-8.0	-20.2	2.5
Guinea Bissau	2012-2014	-17.2	-0.5	6.4
Haiti	2011-2015	-69.0	-12.7	-18.9
Kenya	2015-2017	-62.2	-18.2	-11.5
Lesotho	2013-2016	-52.0	-15.4	-18.0
Macedonia	2011-2016	-34.0	-2.7	-9.3
Mali	2009-2016	-8.6	-20.0	-13.8
Mauritania	2009-2014	-39.9	-0.2	-9.8
Niger	2009-2016	-18.9	-30.1	-31.2
Paraguay	2009-2017	-44.4	-27.8	-27.1
Sao Tome and Principe	2009-2016	-36.4	-17.7	-31.9
Senegal	2010-2017	-8.5	-10.2	1.0
Tajikistan	2010-2011	2.1	-4.3	4.6
Uganda	2010-2016	-76.2	-37.6	-23.8
Average using country year	**2009-2017**	**-30.4**	**-18.8**	**-14.9**
Average across countries	***2009-2017***	***-29.4***	***-16.4***	***-12.6***

* Largely driven by the deviation of +114% in 2014, when the budget was revised from AMD 0.7 to 1.4 billion.
Note: This sample includes 6 countries from the BOOST database that are not included in our primary sample of 35 countries (Costa Rica, Lesotho, Mali, Mauritania, Niger, Senegal), as we do not rely on the functional classification for this particular analysis.

While we lack data on the impact of this underspending, 20 countries in our sample reported a total of 96 national stockout events (i.e., vaccine shortages). In other words, all but two countries – Cameroon and the

Dominican Republic, with one- or two-year data – ran out of at least one vaccine during at least one of the assessed years. Data from WHO and UNICEF suggest that vaccine stockouts are common around the globe and at least some of these are due to funding or procurement delays. In addition, national stockouts are often linked to district-level stockouts, which can cause interruption of vaccination services.

Sources: Budget data from BOOST; for the information on stockouts, see WHO (2018) for example.

Finally, looking at data on the **education** function – with Table 8 including only those countries which consistently report on the main levels of education – average deviations tend to be much smaller than in other sectors, with a small average increase for pre-primary and primary education and a similarly small average decrease for tertiary education. One notable exception that is not displayed here is that for those countries on which we have data, vocational and technical education experience significant underspending of -5.2% on average (excluding outliers). However, what is again most striking, like in the health sector, is the very high levels of underspending for capital expenditure. Regardless of which level of education we focus on, governments on average only manage to spend about 75% of planned capital investments even though, as in health, these represent very small shares of total sector spending.

TABLE 8. NET BUDGET DEVIATIONS BY EDUCATION SUB-FUNCTIONS AND ECONOMIC CLASS (EXCLUDING OUTLIERS)

	obs	mean	sd	min	med	max
Pre-primary and primary	128	2.1	8.3	-20.1	1.7	22.0
Recurrent	*128*	*3.4*	*8.8*	*-18.5*	*2.0*	*25.1*
Capital	*129*	*-26.9*	*37.2*	*-107.8*	*-24.5*	*69.3*
Secondary	129	0.7	10.8	-26.0	0.0	29.2
Recurrent	*120*	*2.4*	*8.6*	*-19.6*	*1.3*	*26.4*
Capital	*126*	*-24.1*	*37.5*	*-92.0*	*-24.6*	*83.7*
Tertiary	122	-2.1	8.5	-22.8	-1.0	19.4
Recurrent	*116*	*0.6*	*7.9*	*-17.8*	*0.3*	*20.5*
Capital	*118*	*-24.8*	*35.3*	*-107.8*	*-25.2*	*59.9*
Other education	135	-3.4	10.1	-26.3	-2.5	17.7
Recurrent	*127*	*2.2*	*8.8*	*-16.9*	*0.2*	*20.9*
Capital	*147*	*-23.6*	*29.4*	*-101.7*	*-23.8*	*54.4*

Source: BOOST dataset and authors' calculations.
Note: obs = number of observations; sd = standard deviation; min = minimum; med = median; max = maximum; other education = other education subfunction, including post-secondary non-tertiary education and subsidiary services to education

4.5 BUDGET DEVIATION PATTERNS WITHIN COUNTRIES

The final part of our analysis examines whether our broad findings on individual country/year observations still hold if we look at what happens within individual countries. We test this by reviewing the number of countries in which budget shares for different types of spending increase or decrease consistently over time – i.e., in all years or in most years. We limit this analysis to countries for which we have at least 5 years of data, which explains the smaller size of the sample used in Tables 9 and 10.

Looking first at economic classification, our general findings are broadly confirmed. More than half of these countries consistently overspend on wages and on transfers (which is part of "other recurrent") and underspend on capital investment, while trends for other categories of spending are less clear cut. What is interesting to note is that there are countries that behave differently. Three countries (i.e., Mexico, Peru, Uruguay) lower the share of the budget devoted to paying salaries in most years, and five of them (i.e., Armenia, Guatemala, Mexico, Myanmar, Peru) increase the share spent on capital investment in most years.

TABLE 9. SHIFTS IN BUDGET SHARES BY ECONOMIC CLASSIFICATION IN INDIVIDUAL COUNTRIES (NO. OF COUNTRIES)

Economic classification	Increased budget share		Reduced budget share		Mixed	Total # of countries reviewed
	all years	at least 70% of the years	all years	at least 70% of the years		
Recurrent spending	13	6	0	3	6	28
Wage bill	13	3	2	1	8	27
Goods & Services	5	3	7	6	7	28
Interest payments	3	9	3	7	5	27
Other recurrent	9	10	4	2	3	28
Capital spending	0	5	13	5	5	28
Other	0	1	3	4	2	10

Source: BOOST dataset and authors' calculations.

Turning our attention to spending on different functions, our findings – pointing to increases in relative budget shares for public safety, social protection and defense, and decreases in budget shares for economic affairs, environment and housing – are clearly confirmed. Here again, though, it is interesting to note that some countries go against the flow. For example, the Dominican Republic, Mexico and Peru increased the share of their budget devoted to economic affairs in most or all years covered, while Poland is the only country which decreased the share of funding going to defense. However, there are also countries which consistently reduced the budget share

going to the health sector (Albania, Angola, Benin, Burkina Faso and, again, Poland) and to the education sector (Dominican Republic).

TABLE 10. SHIFTS IN BUDGET SHARES BY FUNCTIONAL CLASSIFICATION IN INDIVIDUAL COUNTRIES (NO. OF COUNTRIES)

Function	Increased budget share		Reduced budget share		Mixed	Total # of countries reviewed
	all years	at least 70% of the years	all years	at least 70% of the years		
1 General pub. serv.	4	6	4	1	13	28
2 Defense	2	6	1	0	4	13
3 Public safety	7	9	3	2	7	28
4 Economic affairs	1	2	13	5	7	28
5 Environment	1	1	9	8	7	26
6 Housing & community amenities	1	2	8	8	8	27
7 Health	4	3	5	1	15	28
8 Recreation, culture & religion	2	5	2	7	10	26
9 Education	9	2	1	5	11	28
10 Social protection	6	8	3	4	6	27

Source: BOOST dataset and authors' calculations.

5. CONCLUSIONS

In this paper, we contribute to the limited existing work on budget credibility by analyzing information provided in a new dataset, created by the World Bank, that includes cross-country data on government spending – both as originally approved and as finally executed – over the period 2009 - 2017. We use data from a diverse sample of 35 countries for which a reliable functional classification is available, to look at both deviations in aggregate spending and at shifts in the composition of budgets during their implementation.

The evidence demonstrates that budget credibility is an important challenge for the governments in our sample and can undermine countries' efforts to live up to the commitments that they have signed up to as part of the UN 2030 Agenda for Sustainable Development. During execution, government budgets, especially in low- and lower-middle-income countries, tend to deviate substantially from their originally approved plan. Both when we look at individual country/year observations and at country averages, the result tends to point to substantial underspending – almost 10% of the total budget on average across our entire sample and 13.8% and 12.8%, on average, respectively, across the low- and lower-middle-income countries included in our study.

Above and beyond such aggregate deviations, our findings suggest that the composition of government budgets shifts substantially during execution. Recurrent spending – notably spending on public sector wages and on transfers – is increased at the expense of capital investment. Governments tend to increase spending on general public services, defense, public safety, education, and social protection, and substantially reduce funding for economic affairs, environment, and housing. The health sector also experiences a small average reduction in spending. These findings are clearly interlinked, as sectors that are favored during budget execution are those that tend to spend more on salaries (e.g., education and public safety) or transfers (e.g., social protection), while those that lose out are the more capital-intensive ones, like economic affairs and housing. This raises important questions about governments' de facto capacity to manage infrastructure investment that can contribute to the promotion of socioeconomic development.

When we look at trends within specific sectors, our data highlight areas of government intervention that appear to suffer from a steeper decrease in available resources during budget execution. These include agriculture, medical products, public health services and tertiary education. Spending on transport, primary healthcare and primary education, on the other hand, see some limited average increases in their spending levels, which represents positive news for some of the sub-sectors that are key to achieving development outcomes and the SDGs.

Finally, when we consider trends in budget deviations within individual countries, although the evidence broadly confirms our general findings, some interesting cases surface of governments that either manage their resources in ways that seem better aligned with efforts to improve development outcomes – putting additional resources into public investment in economic sectors or reducing defense spending – or that, on the contrary, consistently reduce funding to social sectors during budget implementation. Some of these country cases deserve further attention.

The results presented in this paper should be considered as work in progress, as they are based on a limited number of countries and use data that in some cases warrant further checking and cleaning. Nevertheless, they provide an interesting snapshot of patterns in public spending that might affect countries' development prospects and shed light on issues that are often under-researched. In future work, we intend to look more closely at some of the factors that lie behind the budget variations that have been documented here so as to paint a clearer picture of the dynamics at play. Ultimately, our hope is to arrive at a more thorough understanding of the budget credibility challenges that confront governments and to help them craft adequate interventions to address these.

Appropriate responses to budget credibility challenges will inevitably be very context-specific, but they are likely to include reforms in some of the following areas:

a) strengthening the capacity of governments to more accurately forecast future revenues, in order to limit the impact of poor revenue projections on the credibility of spending;[19]

b) improving planning processes, especially for capital investment projects, so that these can be more adequately costed, prioritized and linked to multi-year spending frameworks;[20]

c) identifying and addressing bottlenecks in budget execution, for example by strengthening and streamlining procurement processes, or by introducing better systems for real-time monitoring of spending across the public sector;[21] and

d) where appropriate, introducing or amending laws and regulations that limit budget deviations, providing better checks and balances to executive discretion in shifting resources during budget execution.

While governments inevitably bear the greatest share of responsibility for managing public resources in a way that promotes better budget credibility, other actors also play an important role in ensuring that budget deviations do not negatively affect service delivery and development outcomes. Oversight bodies including legislatures and audit institutions could monitor budget execution more closely and hold the executive to account for any deviations. Donor agencies could provide more predictable funding, improve the integration of their reporting systems with governments' own, and support capacity-building initiatives within recipient governments, for example in the areas identified in points a) to c) above. Finally, civil society groups and the media could follow the implementation of priority public services and programs and put pressure on governments to deliver them fully and effectively, highlighting the negative impacts of budget deviations.

[19] See Kyobe and Danninger (2005) and a recent IMF blog on the topic at https://blog-pfm.imf.org/pfmblog/2019/02/-the-politics-of-revenue-forecasting-.html.

[20] See, for example, Rajaram et al. (2014), Miller and Mustapha (2016) and World Bank (2013).

[21] See, for example, the chapters in Part III in Allen et al. (2013).

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APPENDIX TABLE

LIST OF COUNTRIES AND YEARS OF DATA FROM THE BOOST DATA SET INCLUDED IN THIS STUDY

Country	Region	Income level	Years
Afghanistan	South Asia	Low-income	2011-2016
Albania	Europe & Central Asia	Upper-middle-income	2010-2017
Angola	Sub-Saharan Africa	Lower-middle-income	2009-2016
Argentina	Latin America & Caribbean	High-income	2009-2016
Armenia	Europe & Central Asia	Upper-middle-income	2009-2016
Benin	Sub-Saharan Africa	Low-income	2009-2016
Brazil	Latin America & Caribbean	Upper-middle-income	2009-2016
Bulgaria	Europe & Central Asia	Upper-middle-income	2009-2017
Burkina Faso	Sub-Saharan Africa	Low-income	2009-2015
Cameroon	Sub-Saharan Africa	Lower-middle-income	2014-2015
Cape Verde	Sub-Saharan Africa	Lower-middle-income	2012-2016
Dominican Republic	Latin America & Caribbean	Upper-middle-income	2009-2016
Ecuador	Latin America & Caribbean	Upper-middle-income	2009-2018
Guatemala	Latin America & Caribbean	Upper-middle-income	2011-2015
Guinea Bissau	Sub-Saharan Africa	Low-income	2010-2015
Haiti	Latin America & Caribbean	Low-income	2012-2015
Kenya	Sub-Saharan Africa	Lower-middle-income	2014-2017
Kyrgyz Republic	Europe & Central Asia	Lower-middle-income	2009-2011
Macedonia	Europe & Central Asia	Upper-middle-income	2011-2016
Mauritius	Sub-Saharan Africa	Upper-middle-income	2009-2011
Mexico	Latin America & Caribbean	Upper-middle-income	2009-2016
Moldova	Europe & Central Asia	Lower-middle-income	2009-2017
Mozambique	Sub-Saharan Africa	Low-income	2009-2017
Myanmar	East Asia & Pacific	Lower-middle-income	2010-2017
Namibia	Sub-Saharan Africa	Upper-middle-income	2009-2015
Paraguay	Latin America & Caribbean	Upper-middle-income	2009-2017
Peru	Latin America & Caribbean	Upper-middle-income	2009-2016
Poland	Europe & Central Asia	High-income	2009-2014
Romania	Europe & Central Asia	Upper-middle-income	2009-2011
Sao Tome and Principe	Sub-Saharan Africa	Lower-middle-income	2009-2016
Solomon Islands	East Asia & Pacific	Lower-middle-income	2009-2015
Tajikistan	Europe & Central Asia	Low-income	2010-2011
Uganda	Sub-Saharan Africa	Low-income	2009-2015
Ukraine	Europe & Central Asia	Lower-middle-income	2009-2017
Uruguay	Latin America & Caribbean	High-income	2011-2016