OVERVIEW

OFF the BOOKS

Understanding and Mitigating the Fiscal Risks of Infrastructure

> Matías Herrera Dappe Vivien Foster Aldo Musacchio Teresa Ter-Minassian Burak Turkgulu



OFF THE BOOKS

Overview

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SUSTAINABLE INFRASTRUCTURE SERIES

Overview

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Understanding and Mitigating the Fiscal Risks of Infrastructure

Matías Herrera Dappe, Vivien Foster, Aldo Musacchio, Teresa Ter-Minassian, and Burak Turkgulu



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Foreword

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Worldwide more than 700 million people lack access to electricity, and about 1 billion people live more than two kilometers from an all-season road. By 2050, the number of people living in cities will increase by 2.5 billion, with most of the increase occurring in developing countries. All of these people need access to reliable electricity networks and dependable transport alternatives, lack of which hampers economic and social development in low- and middle-income countries (LMICs) by constraining private sector investments, the integration and efficiency of goods and labor markets, and access to educational opportunities and health care services.

A recent report in this series (*Beyond the Gap*) estimates that LMICs will need to invest at least 3.5 percent of their GDP per year in the electricity and transport sectors to close the infrastructure gap and achieve the Sustainable Development Goals while staying on track to keep the rise in global temperature to 2°C. Undertaking this level of investment—and the related operations and maintenance expense—will require governments to mobilize massive resources through all means available, including on-budget spending and off-budget vehicles, namely state-owned enterprises (SOEs) and public-private partnerships (PPPs).

Especially given the strong headwinds currently facing LMICs, governments will need to use their fiscal space efficiently and sustainably. As evidenced by the January 2023 edition of the *World Economic Prospects* report, developing economies are now facing the triple challenge of heavy debt burdens, the global tightening of financial conditions, and declining growth rates, all of which put pressure on infrastructure sector budgets. Combined with the needs to invest in infrastructure as part of the postpandemic recovery and to finance resilience to climate change and the transition to cleaner fuels, these global challenges increase the urgency of creating sustainable fiscal space for infrastructure.

To do so, LMIC governments need to improve their understanding of the fiscal risks of infrastructure, which often arise because significant swathes of infrastructure spending take place "off the books," through a variety of extra-budgetary vehicles. Realization of such risks can present countries with large unanticipated demands on the public purse—through either a steady drain or an occasional major liability—that increase the life-cycle cost of infrastructure provision.

Experience shows that such risks can be mitigated when governments account for and manage them properly. Doing so requires improved planning and implementation of infra-

structure projects regardless of the financing method used. Governance reforms to improve the financial sustainability of SOEs and clarify their mandate are also essential to make infrastructure spending and management sustainable. Mobilizing private capital will be increasingly important to access additional expertise and promote efficiency gains, but governments should not ignore the explicit and implicit fiscal risks PPPs pose when projects do not go according to plan.

This report takes a comprehensive look at the fiscal risks of infrastructure. It provides a conceptual framework for understanding the risks based on the modality of provision, presents quantitative evidence on the risks, and proposes concrete reforms for managing them. The powerful conceptual framework proposed, and the evidence (based on rigorous analytical work) presented, are accessible to policy makers and a general audience familiar with the infrastructure sector.

Good governance of infrastructure can help governments deliver infrastructure to the billions of people for whom it is currently inadequate. By targeting reforms to areas in which they can be expected to have the greatest impact in ensuring sustainable infrastructure for all and recognizing the unique situations every country faces, this report presents policy makers with a realistic roadmap to success.

Guangzhe Chen Vice President for Infrastructure The World Bank

Acknowledgments

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Main Messages

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Developing countries face significant infrastructure needs—and rising debt levels and tightening fiscal and monetary conditions are increasing pressure on the funds available for infrastructure. Whether governments spend directly on budget, spend at arm's length through state-owned enterprises (SOEs), or delegate spending via public-private partnerships (PPPs), the risks of fiscal surprises—infrastructure costing more than projected—are high. It is therefore critical that governments tackle the governance challenges undermining the efficiency of infrastructure spending and absorbing scarce fiscal space.

This report quantifies the magnitude and prevalence of fiscal risks from electricity and transport infrastructure, identifying their root causes across a range of low- and middle-income countries and putting forward policy options to tackle fiscal risks from infrastructure in a comprehensive and cohesive manner. By providing policy makers with a deeper understanding of the fiscal risks of infrastructure, it can help them understand just how much is at stake in the good governance of infrastructure and target reforms to areas in which those efforts can be expected to have the greatest impact.

Three main findings stand out from the analysis:

• Off-budget modalities drain public finances more often and on a larger scale than usually assumed. Infrastructure SOEs require average annual fiscal injections of 0.25 percent of gross domestic product (GDP) to remain afloat. In 57 percent of the cases studied, SOEs received net fiscal injections, with the injections reaching as high as 3 percent of GDP in some cases. One reason the full extent of fiscal dependency is not always clearly understood is that governments use a wide range of fiscal instruments to support infrastructure SOEs, including operations subsidies, equity injections, and loans from government and other SOEs. As a result, assessing the full extent of the problem is challenging.

A large share of PPP contracts is renegotiated, leading to a small but frequent drain of fiscal resources. The annual fiscal cost of renegotiation averages about 0.2 percent of GDP in the countries studied (this figure should be viewed as a lower bound, because these countries are among the best in the world in terms of PPP governance). Early termination of PPPs is less frequent than renegotiation, but terminations can be costly, because multiple terminations often occur at the same time. The predicted fiscal risks from early termination in a sample of developing countries are 0.1–2.8 percent of 2020 GDP.

- Inefficiencies in public provision lead to fiscal surprises in the near, medium, and long term. Developing countries executed only about 70 percent of infrastructure investment budgets in 2010–18, indicating a potentially significant risk of project delay and cost overruns. There is also evidence of a pronounced capital bias in infrastructure expenditure, especially in the road sector. Coupled with expenditure that is not as productive or efficient as it could be, this bias leads to growing investment liabilities because of asset deterioration, which extreme weather events can exacerbate. In addition, public infrastructure spending has been low and investment has declined in recent years, falling well short of normative estimates of what is required to meet development goals.
- When it rains, it pours. On-budget spending on infrastructure was procyclical in 2005–20, suggesting that public infrastructure spending is a soft target for budget cuts. During economic downturns, SOEs can weaken a country's overall fiscal situation and amplify the negative macroeconomic shock, because SOEs need fiscal injections precisely when governments are under pressure from the fall in total tax revenues. A profound macroeconomic crisis also increases the fiscal risks from early termination of PPPs by an order of magnitude immediately after the shock.

Vulnerability to exogenous shocks and the prevalence of perverse incentives faced by government officials, SOE managers, and private partners (which, in turn, lead to moral hazard and principal–agent problems) explain the prevalence of fiscal risks in the provision of infrastructure service. A reform agenda to mitigate the fiscal risks from infrastructure should be grounded in an effort to build government capacity and include the following four building blocks:

- Robust integrated public investment management (PIM) leads to projects being selected because they are aligned with a country's development goals and yield the highest net benefits and provision modalities being selected based on value for money and fiscal affordability. Robust integrated PIM requires consistent assessment of all potential projects and consistent fiscal treatment of all implemented projects (projects delivered through direct public provision, PPPs and, in some cases, SOEs). Such management is needed to ensure that projects and modalities are not selected because of differential fiscal treatment. Countries should also adopt rolling medium-term fiscal frameworks that include PPPs, in order to ensure alignment of investment plans with available funding. The effectiveness of integrated PIM rests on granting the ministry of finance final authority to approve projects and contract renegotiations and modifications.
- Effective fiscal and corporate governance of SOEs allows and incentivizes boards and managers to operate SOEs efficiently, thereby mitigating fiscal risks. It requires clearly specifying the SOEs' mandates and avoiding government interference in SOEs' operations, particularly through the imposition of policy mandates or quasi-fiscal operations. If interference cannot be avoided, SOEs should be compensated in a commensurate, timely, and transparent manner. Where an independent sector regulator exists, it should work with the ministry of finance to determine appropriate compensation. SOEs' access to financing should be based on their debt-servicing capacity and approved by the ministry of finance in a nondiscretionary manner. To mitigate the need for fiscal injections, the government should establish clear requirements for financial management and monitoring.

- A robust PPP preparation, procurement, and contract management framework that allocates risk optimally and limits opportunistic behavior is needed to mitigate the risks from renegotiation and early termination of PPPs. A robust framework should avoid allocating demand risk to the private partner when it has no or minimal control over demand. Flexible-term contracts, such as present-value-of-revenue contracts, are a good option for allocating the demand risk to the government in such cases. Measures to reduce financing risk can help reduce the risk of early termination. Clearly regulating contract renegotiations, modifications, and early terminations and establishing alternative dispute resolution mechanisms are important measures for mitigating fiscal risks.
- **Integrated fiscal risk management** leads to the most efficient outcomes, because of potential interactions among different risks and portfolio effects. It requires a central institutional structure, within the ministry of finance or chaired by the minister, that is responsible for managing all fiscal risks. It also requires comprehensive disclosure of fiscal information. A risk mitigation strategy should start with sound macroeconomic and debt management. Risks from natural disasters, for example, particularly disasters related to extreme weather events, affect different types of infrastructure and noninfrastructure assets, requiring integrated approaches to mitigate those risks.

Abbreviations

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GDP	gross domestic product
IPSAS	International Public Sector Accounting Standards
MTEF	medium-term expenditure framework
MTFF	medium-term fiscal framework
PIM	public investment management
PPI	Private Participation in Infrastructure
PPP	public-private partnership
QFO	quasi-fiscal operation
ROAA	return on average assets
SOE	state-owned enterprise

All dollar amounts are US dollars unless otherwise indicated.

Overview: Key Findings and Policy Recommendations

economic growth and development; it can also increase resilience to shocks and help countries meet global climate targets. Electricity and transport infrastructure allow firms to produce and trade and people to access economic and social opportunities. Resilient infrastructure allows areas to remain connected and receive needed support in the event of shocks. Electricity and transport systems together account for over half of global greenhouse gas emissions. If the right infrastructure investments in these sectors are made, both sectors can contribute significantly to the reduction of greenhouse gas emissions.

Governments play a key role in providing infrastructure, because of its socioeconomic and environmental implications and because infrastructure investments tend to be large, risky, and affected by market failures. Investments in highways, railways, ports, and power plants require hundreds of millions of dollars in site-specific and longlived assets that are exposed to significant risks. The network characteristic of electricity and transport infrastructure means that coordinated planning and development is needed to maximize their benefits and reduce the risk of "bridges to nowhere." Some infrastructure assets, such as power transmission networks, are natural monopolies, which require some level of government involvement.

Governments provide infrastructure directly (through line ministries or public authorities) and indirectly (through off-budget provision modalities such as stateowned enterprises [SOEs] and public–private partnership [PPPs]). Capital spending on electricity and transport through direct public provision declined from a peak of 1.8 percent of gross domestic product (GDP) in 2012 to 1.2 percent of GDP in 2018. Between 2009 and 2018, average spending on infrastructure by SOEs and PPPs in a sample of developing countries represented 37–53 percent of total capital spending through the three modalities (figure 0.1).

Developing countries face significant infrastructure needs, and rising debt levels and tightening fiscal and monetary conditions are increasing pressure on the funds available for infrastructure. Recent estimates put the electricity and transport infrastructure investment needed in the developing world to deliver on the Sustainable Development Goals and the Paris Climate Agreement at 3.5 percent of GDP a year through 2030



FIGURE 0.1 Share of capital spending on infrastructure in developing countries, by modality, 2009–18

Source: Original figure for this publication, based on data from the BOOST, World Bank Infrastructure SOEs, and PPI databases. Note: Capital expenditures in PPPs were distributed over a five-year period beginning in the investment year indicated in the PPI Database. Expenditures through direct public provision are expenditures by the general government. When spending through direct public provision in the power sector was not available for a country in the BOOST data, total energy spending was used. Countries include Albania, Argentina, Bhutan, Bulgaria, Burundi, Ethiopia, Georgia, Indonesia, Kenya, Kosovo, Peru, Romania, Solomon Islands, South Africa, and Ukraine. PPP = public-private partnership; SOE = state-owned enterprise.

(Rozenberg and Fay 2019). Government debt has grown to critical levels for developing countries since 2010, exacerbated by the pandemic (Kose and others 2021). Fiscal deficits are projected to remain above their pre-pandemic levels, putting further pressure on public debt. The cost of borrowing, in both global and domestic markets, is increasing as central banks tighten monetary policy in response to inflationary pressures. Rising interest rates may make current levels of debt unsustainable for many developing countries (World Bank 2022), hindering their ability to invest in needed infrastructure.

Governance challenges undermine the efficiency of spending and absorb scarce fiscal space. Whether governments spend directly on budget, spend at arm's length through SOEs, or delegate spending via PPPs, the risk of fiscal surprises—infrastructure costing more than projected—is high.

Closing the infrastructure gap while supporting the postpandemic recovery requires the creation of sustainable fiscal space for infrastructure. Fiscal risks must be mitigated in order to increase the value for money from existing resources and additional capital that will need to be mobilized to close the gap. Because of current macroeconomic conditions, developing countries will try to increase private capital mobilization through PPPs and likely call on their SOEs to increase investments and help implement social and employment generation programs, heightening the need to mitigate the fiscal risks associated with these channels.

This report quantifies the magnitude and prevalence of fiscal risks from electricity and transport infrastructure and identifies their root causes across a range of low- and middle-income countries. Drawing on important new sources of evidence, such as the World Bank Infrastructure SOEs Database, and compiling many others, the report quantifies the magnitude of different types of risks and examines how risks vary across contexts.¹ The results make it possible to answer several important questions: How much of an ongoing fiscal drain do off-budget infrastructure vehicles like SOEs and PPPs routinely represent? How frequent and large are major bailouts? How do major macroeconomic shocks affect SOEs and PPPs? What fiscal surprises are associated with on-budget spending? How does the magnitude and profile of fiscal surprises differ across types of infrastructure, such as electricity and transport?

A deeper understanding of the fiscal risks of infrastructure can help policy makers understand how much is at stake in the good governance of infrastructure and target reforms in areas in which they can be expected to have the greatest impact. **This report contributes to the debate on creating sustainable fiscal space for infrastructure by putting forward policy options to tackle fiscal risks from infrastructure in a comprehensive and cohesive manner.**

The report begins by presenting a conceptual framework for assessing fiscal risks from infrastructure, focusing on direct public provision, SOEs, and PPPs (chapter 1). It then provides new empirical evidence on the prevalence, magnitude, and sources of fiscal risks in developing countries from direct public provision (chapter 2), SOEs (chapter 3), and PPPs (chapter 4). The last chapter presents a reform agenda for mitigating fiscal risks from infrastructure. The rest of this overview presents the main findings and policy recommendations.

WHAT ARE THE MAIN SOURCES OF FISCAL RISKS FROM INFRASTRUCTURE?

Fiscal risks from infrastructure manifest themselves in different ways, depending on the modality of provision (figure 0.2). Direct public provision of infrastructure can lead to fiscal surprises through unanticipated additional expenditures caused by cost



FIGURE 0.2 Sources of fiscal costs and risks associated with provision of infrastructure

Source: Original figure for this publication.

Note: PPP = public-private partnership; SOE = state-owned enterprise.

overruns or asset deterioration. Infrastructure SOEs can create substantial risks for public finances through explicit guarantees, public insurance schemes, and cashflow and bailout risk. Cashflow risk stems from the volatility of SOE net income, which requires fiscal transfers to cover occasional and modest losses associated with exogenous shocks and inefficiencies related to soft budget constraints. Bailout risk refers to the risk associated with having to recapitalize an SOE; help it avoid default or bankruptcy; or cancel its liabilities because it had insufficient capital buffers to deal with large, unexpected shocks and the continuous write-off of losses.

Involving the private sector in the provision of infrastructure through PPPs changes the nature of the fiscal risks. Direct liabilities, such as upfront capital subsidies and availability payments, can lead to fiscal surprises if PPPs are kept off the fiscal balance sheet and the budget. Guarantees of minimum revenue or demand, the foreign exchange rate, and debt (provided by the government to ensure the commercial feasibility and bankability of PPPs) can lead to fiscal surprises. Infrastructure PPP contracts themselves create contingent liabilities from renegotiations and early terminations that can also lead to fiscal surprises.

No matter how good government plans and projections are, uncertainties exist; when realized, they can put financing pressure on the fiscal authorities. Most of these uncertainties are common to all provision modalities. Some are specific to infrastructure projects; others are related to economic factors or natural disasters. Infrastructure projects tend to be technically complex and involve large budgetary outlays, including substantial sunk costs. Infrastructure is site specific, which makes its cost depend on the availability and geological characteristics of the land it is built on as well as on environmental regulations. The fact that infrastructure investments are typically long-lived increases the uncertainties associated with both construction and operations and maintenance costs as well as demand for their services, leaving them vulnerable to unforeseen exogenous shocks, including macroeconomic cycles or crises, exchange rate fluctuations, and natural disasters. The complexity and long-term nature of infrastructure greatly complicates both forecasting and provisioning for risks.

Governance challenges can create and increase the magnitude of fiscal risks. Significant social and political pressures may distort governments' decisions regarding the selection of projects and provision modalities. Especially in low-income countries, public administrations may have limited technical skills and data to undertake integrated transport and electricity planning and select the optimal provision modality for each project.

Weaknesses in public investment management (PIM) can lead to fiscal risks. Lack of coordination across and within levels of government in planning and budgeting lead to projects being only partially implemented. The political benefit of new infrastructure and low capacity often create incentives to prioritize capital spending over maintenance spending (capital bias) and underestimate the likelihood and impact of possible adverse shocks. Flaws in contract and asset management can lead to inefficient spending. All these weaknesses can lead to inadequate maintenance and poor-quality construction, eventually requiring additional spending on maintenance to avoid asset impairment, which disaster and extreme weather events can exacerbate. The fact that public spending on infrastructure tends to be the first victim of fiscal crises adds to the risk of asset impairment.

Flaws in fiscal and corporate governance that create soft budget constraints are the main SOE–specific source of fiscal risks. Soft budget constraints arise whenever a government is unable to credibly commit not to provide unjustified financial support. Soft budget constraints hurt SOEs by encouraging them to take excessive risks and sapping their incentive to be efficient.

One of the main causes of soft budget constraints are quasi-fiscal operations (QFOs)—the imposition of public policy objectives and practices on SOEs. Examples of QFOs include the pricing of goods and services below cost-recovery levels (to moderate the headline inflation rate or prevent social discontent, for example); the imposition of labor market policies that constrain SOEs' ability to adjust their workforces; the excessive extraction of resources by their owner governments; the granting of preferential access to financing; information asymmetries between SOEs and their owners; and flaws in corporate governance that exacerbate information asymmetries and allow government interference in the selection of SOE boards and management.

Flaws in PPP governance—including inadequate fiscal treatment of PPPs, the uncertainty around infrastructure. and the long-term contractual nature of PPPs—can give public authorities and private partners incentives to behave opportunistically, creating fiscal risks. Governments have incentives to deliver projects through PPPs rather than directly because of the fiscal implications rather than because of value for money. The off-budget nature and information asymmetries between different government authorities may give awarding authorities the incentive to behave strategically and use renegotiations to fulfill policy and political objectives. When the government is unable to commit not to renegotiate a PPP or there is significant uncertainty regarding the return on investment of a PPP, strategic and opportunistic behavior by the private partner can lead to renegotiations and even early termination.

OFF-BUDGET MODALITIES DRAIN PUBLIC FINANCES MORE OFTEN AND ON A LARGER SCALE THAN USUALLY ASSUMED

It has long been known that infrastructure SOEs and PPPs can lead to extreme fiscal surprises (tail risk) (Bova and others 2019; Musacchio and Pineda Ayerbe 2019; Schwartz and others 2020). This report shows that during good times SOEs and PPPs represent a more frequent and much larger drain on public finances than usually assumed.

Fiscal risks from SOEs

Infrastructure SOEs require average annual fiscal injections of 0.25 percent of GDP to remain afloat. In 57 percent of the 187 country-year observations captured for the period 2009–18, infrastructure SOEs received fiscal injections (net of asset increases).² These injections included 4 events with fiscal injections of more than 1 percent of GDP, 38 with fiscal injections of 0.2–1.0 percent of GDP, and 64 with fiscal injections of less than 0.2 percent of GDP (figure 0.3). Fiscal risk from SOEs should therefore be thought of as a series of small to medium-size deviations from budgeted figures requiring frequent fiscal injections.

One reason why the full extent of fiscal dependency is not always clearly understood is that governments use a wide range of fiscal instruments to support infrastructure SOEs—including operations subsidies, equity injections, and loans from government and other SOEs—which make assessing the full extent of the problem challenging. The type and extent of fiscal injections used to support infrastructure SOEs varies across countries (figure O.4). During 2009–18, for example, Bulgaria supported its infrastructure SOEs with average annual fiscal injections of 0.8 percent of GDP, using operations subsidies and loans from SOEs as the main instruments. In Bhutan and Croatia, average



FIGURE 0.3 Distribution of fiscal injections to infrastructure SOEs

Source: Original figure for this publication, based on data from the World Bank Infrastructure SOEs Database. *Note:* Data are from 2009–18. Box shows interquartile variation (25–75 percent) of fiscal injections to GDP. Horizontal line across the box shows the median. Whiskers show the maximum and minimum, capped at 1.5 times the interquartile range. Dots represent outliers. Distribution is over positive fiscal injection events. GDP = gross domestic product; SOE = state-owned enterprise.



FIGURE 0.4 Average annual fiscal injections to infrastructure SOEs, 2008–19, by country

Source: Original figure for this publication, based on data from the World Bank Infrastructure SOEs Database. Note: Government loans and SOE loans capture the annual increase in long-term debt or loans. Figure was constructed by adding operations subsidies, government equity injections, and increases in government loans and SOE loans and subtracting change in assets from the previous year by SOE for each year to determine whether there was a fiscal injection (that is, a positive difference). Fiscal injections by sector were then added in each country for each year and the resulting figure was divided by GDP, which was then averaged over years. GDP = gross domestic product; SOE = state-owned enterprise. annual fiscal injections to infrastructure SOEs amounted to about 0.5 percent of GDP, with Bhutan using mostly SOE loans and government equity injections and Croatia using mostly operations subsidies and government loans.

The negative return on assets of infrastructure SOEs shows that governments provide an implicit subsidy to them on top of their explicit fiscal injections. The average adjusted return on average assets (ROAA) of infrastructure SOEs once operations subsidies are netted from net income is –5.1 percent. The average ROAA when operations subsidies are considered is –0.14. Both the ROAA and the adjusted ROAA are significantly lower than those of comparable private firms (2.4 and 5.2 percentage points lower, respectively, on average), revealing the extent of the implicit subsidy provided by the government.

The underperformance of infrastructure SOEs is associated with state ownership and QFOs. SOEs underperform similar private firms, with the former yielding lower return on assets gross and net of operations subsidies than the latter. The difference in the ratios of employee costs to total expenses between SOEs and private companies is 20.5 percentage points (Herrera Dappe and others 2022). One of the QFOs SOEs undertake on behalf of governments is generating employment, often paying salaries that are at least as high as in the private sector. The larger share of employment expenses relative to revenues is likely a consequence of the role SOEs play as employers. QFOs that cap tariffs can lead to net losses, which in many cases are not adequately compensated by the government.

The magnitude and likelihood of fiscal risks from power and transport SOEs present interesting differences (box 0.1). Transport SOEs are more likely to have received

BOX 0.1 Sectoral features affecting the size and profile of fiscal risks from SOEs

On average, SOEs in the power sector absorb the most fiscal resources, with annual fiscal injections representing 0.25 percent of GDP (figure BO.1.1). They are followed by SOEs in the road, rail, and airline and airport sectors, with average annual fiscal injections of 0.24, 0.12, and 0.04 percent of GDP, respectively. In the power sector, average annual fiscal injections are equivalent to 10 percent of average assets; in the transport sectors, they are equivalent to 20–35 percent of average assets. Fiscal support to SOEs therefore provides significant recapitalization, most of it through operations subsidies. Loans from government and other SOEs are also important for power and road SOEs.

Transport SOEs were more likely to have received fiscal injections, but the power sector was more likely to have received larger injections. In the 156 country-year observations captured in this report for the transport sector, there were 77 instances of fiscal injections (49 percent). In the 180 country-year observations captured for the power sector, there were 59 instances of fiscal injections (33 percent). The share of injections that exceeded 0.2 percent of GDP was 36 percent in the transport sector and 34 percent in the power sector. In the transport sector, only 1 percent of the injections exceeded 0.6 percent of GDP; in the power sector, 17 percent did so (figure BO.1.2).

Power SOEs had a modest positive rate of return on average assets (ROAA). The average adjusted ROAA was 1.0 percent and the average ROAA 1.9 percent (figure BO.1.3). Power SOEs





Source: Original figure for this publication, based on data from the World Bank Infrastructure SOEs Database. *Note:* Government loans and SOE loans capture annual positive increases in long-term debt or loans. Figure was constructed by adding operations subsidies, government equity injections, and increases in government loans and SOE loans and subtracting the change in assets from the previous year by SOE for each year to determine whether there was a fiscal injection (that is, a positive difference). Fiscal injections by sector in each country were then added for each year and the resulting figure was divided by GDP. All country-year observations of positive fiscal injection events were then averaged by sector. GDP = gross domestic product; SOE = state-owned enterprise.



FIGURE BO.1.2 Size distribution of fiscal injections in the transport and power sectors

Source: Original figure for this publication, based on data from the World Bank Infrastructure SOEs Database. *Note:* GDP = gross domestic product.

BOX 0.1 Continued

FIGURE BO.1.3 Return on average assets of infrastructure SOEs, with and without adjustment for operations subsidies, by sector



Source: Original figure for this publication, based on data from the World Bank Infrastructure SOEs Database. *Note:* Data are averages for 2009–18. SOE = state-owned enterprise.

have manageable payroll costs (17 percent of revenues on average) but are highly exposed to fluctuations in fuel prices, which account for a significant share of revenues (40 percent on average) and affect their profitability. Several governments cap electricity tariffs at below cost-recovery levels, one of the main reasons for the underperformance of SOEs. In some cases, SOEs are properly compensated for QFOs through operations subsidies.

Transport SOEs performed worse financially than power SOEs. The average adjusted ROAA of rail, road, and airline and airport SOEs ranged between -16 and -12 percent; the average ROAA was 1.4 percent for road SOEs and about -4.0 percent for rail and airline and airport SOEs. These differences partly reflect the fact that payroll expenses tend to absorb the bulk of revenues in roads (62 percent) and airlines and airports (91 percent), and substantially exceed revenues in railways (188 percent).

Note: SOE = state-owned enterprise.

fiscal injections, but the power sector is more likely to have received larger injections. SOEs in the power sector therefore absorb the most fiscal resources. Power SOEs had a modest positive rate of return on average assets and performed better financially than transport SOEs.

Fiscal risks from PPPs

PPP renegotiations represent a small but frequent drain on fiscal resources. Evidence on the fiscal costs of PPP renegotiations is scarce. Data from Chile and Peru collected for this study indicate that the annual fiscal costs of transport PPP renegotiations tend to be less than 0.54 percent of GDP. Renegotiations in both countries have been frequent (figure 0.5), with average annual fiscal costs of 0.14 percent of GDP in Chile and 0.2 percent in Peru.³ The high



Sources: (a) Engel and others 2022; (b) Original figure for this publication, based on data from Marchesi 2022. *Note:* Peru incurred no renegotiation costs between 2001 and 2005, although there were PPPs. GDP = gross domestic product; PPP = public-private partnership.

frequency of renegotiations in Chile and Peru is consistent with global evidence showing that 42–91 percent of transport PPPs are renegotiated.

Early termination of PPPs is less common than renegotiations, but the fiscal costs tend to be higher. Almost 3 percent of electricity and transport PPPs in developing countries (151 PPPs) were terminated early between 1990 and 2020. Cancellations are costly because three-quarters of them occur in clusters. The number of cancelled power and transport PPPs was 25 in India in 2012–14, 15 in Mexico in 1996–97, 9 in China in 2002–04, 6 in Brazil in 2004–06, 5 in China in 1999–2001, and 5 in Malaysia in 2001–02 (figure O.6). In Mexico, the cancellations of toll roads imposed a significant cost on the Treasury, including a 1.6 percent of GDP debt assumption in 1997 (Bova and others 2019).

Developing countries need to set aside significant resources to be prepared to cover the fiscal costs from early termination of infrastructure PPPs. Using the



FIGURE 0.6 Number of early terminations of PPPs in developing countries, 1990–2020

Source: Original figure for this publication, based on data from the PPI Database.

Note: The size of the bubbles represents total investment in the cancelled PPPs, and each color represents a country. The bubbles that cover several years are centered at the middle of the period (the second year if only two years are covered). Only the largest bubbles have been labeled. PPP = public-private partnership.

value-at-risk approach, this report estimates the maximum expected loss from early termination of PPP portfolios with 99 percent confidence—99 percent value-at-risk—for 17 developing countries under three scenarios. The value-at-risk from early termination of active PPPs over their lifetime is highest in Brazil (0.89–2.82 percent of 2020 GDP), Peru (0.47–1.25 percent), and Albania (0.39–1.02 percent) (figure O.7). These figures represent the amount each government needs to set aside in a contingency fund to cover the maximum expected loss, with 99 percent confidence, over the entire contract period. The amount in the contingency fund needs to be adjusted every year, because projects age, changing their probability of early termination; some PPPs reach the end of their contract; and new PPPs are awarded.

The risk allocation in PPP contracts affects the likelihood of renegotiation and early termination. In general, PPP contracts that shift market-related risks, such as demand risk, to the private partner are more susceptible to renegotiation if the private partner has limited or no control over demand. Evidence from Chile indicates that variable-term highway PPPs are renegotiated less frequently and have much lower renegotiated costs than fixed-term highway PPPs (Engel and others 2022). Measures that reduce the financing risk of a project, such as the provision of support through capital grants, revenue subsidies, or in-kind transfers, can reduce the rates of early termination (Herrera Dappe, Melecky, and Turkgulu 2022).

Governance features are also associated with the likelihood of renegotiation and early termination, as they can affect the incentives to renegotiate or terminate **PPPs.** Limiting the causes for renegotiation and requiring competitive procurement for any additional work reduce the private partner's bargaining power and the incentives of both the private partner and the government to renegotiate (Engel and others 2022). In countries with better bureaucratic quality and an independent PPP regulatory body, PPP contracts tend to be





Source: Original figure for this publication, based on data from PPI Database, Polity IV Project, World Development Indicators Database, and Laeven and Valencia 2020.

Note: Fiscal risks are the maximum expected loss over the entire contract period with 99 percent confidence, expressed as a percent of GDP of a single year. The low scenario assumes that 79.3 percent of the PPP's debt (the average ultimate recovery rate of debt to PPPs estimated by Moody's Investor Service [2019]) is covered by the government in the event of early termination and no private equity is covered. The medium scenario assumes that the government covers all debt and private equity. The high scenario assumes that on top of the debt, the government compensates the private party for 150 percent of the equity it invested in the project. The estimations for Ukraine do not consider the impact of the Russian invasion. GDP = gross domestic product; PPP = public-private partnership.

renegotiated less often (Guasch, Laffont, and Straub 2008), because such institutions allow less opportunistic behavior by the government and the private partner (Guasch and Straub 2009). In countries with stronger constraints on executive power, PPPs have lower probability of early termination, because the constraints limit the government's incentive to terminate PPPs or unilaterally change the economic and financial balance of the contract (Herrera Dappe, Melecky, and Turkgulu 2022).

Fiscal risks from demand guarantees tend to be smaller than those from renegotiations and early termination, particularly when guarantees are used prudently. Both Chile and Peru have been conservative in providing guarantees to attract private investment; the fiscal costs from guarantees were therefore low. In Chile, the annual fiscal costs from traffic demand guarantees on toll road PPPs were as high as 0.04 percent of GDP during 2003–21. The highest cost was incurred in 2020, during the COVID-19 pandemic. Peru paid a guarantee just once, costing the government only \$2.6 million. Chile and Peru's experience differs markedly from that of Türkiye, which initiated an ambitious program of highway and bridge PPPs in the late 2000s. It provided generous minimum revenue guarantees in hard currency to attract the private sector. The fiscal cost of these guarantees ranged from 0.04 percent of GDP in 2017 to 0.21 percent of GDP in 2021.

Most countries do not have a robust framework for the fiscal treatment of PPPs, which creates a fertile ground for fiscal risks. If the cost of PPP projects is not accounted as public investment in the budget and the debt to the concessionaire is not recorded, only when fiscal commitments and contingent liabilities materialize is the true cost of PPPs recognized. According to the World Bank's *Benchmarking Infrastructure Development 2020* report, only 17 of the 140 surveyed economies had provisions for the budgetary, reporting, and accounting treatment of PPPs, and only 9 had adopted the International Public Sector Accounting Standards (IPSAS), which require PPPs to be consolidated in the public sector's balance sheet. In 101 of the 140 economies surveyed, the ministry of finance has the authority to approve PPPs, but in only 22 economies it has the authority to approve renegotiations. The lack of such authority can lead to opportunistic renegotiations and fiscal surprises.

The magnitude and likelihood of fiscal risks from power and transport PPPs present interesting differences (box 0.2). Transport PPPs have a higher rate of renegotiation, are renegotiated sooner, and are more likely to result in direct fiscal transfers than power PPPs. Transport PPPs are more likely to be terminated early and lead to higher fiscal risks from early termination than electricity PPPs.

BOX 0.2 Sectoral features affecting the size and profile of fiscal risks from PPPs

The power sector attracted more private capital through PPPs than the transport sector did. More than 50 percent of all PPPs (transport, energy, water, and information and communications technology) and investments through PPPs in developing countries were in the power sector. Twenty-eight percent of all PPPs and 38 percent of all investments through PPPs were in the transport sector.

Transport PPPs have a higher rate of renegotiation, are renegotiated sooner, and are more likely to result in direct fiscal transfers than power PPPs. The share of PPPs that is renegotiated is 42–91 percent in the transport sector and 24–41 percent in the power sector, depending on the country. In developing countries, the first renegotiation takes place about a year after signing in the transport sector and about 1.7 years after signing in the power sector. Renegotiation of PPPs in the power sector tends to lead to minimal, if any, fiscal transfers, because electricity tariffs paid by final consumers are regulated and can be readily adjusted to maintain the profitability of electricity PPPs, even transmission and generation PPPs. In Peru, for example, transmission projects are awarded on the basis of required payments for investment and maintenance of the infrastructure, but concessionaires are compensated through electricity tariffs that are routinely adjusted to make the concessionaire whole (Marchesi 2022). In contrast, the revenues of transport PPPs come from direct users or government payments, and it is usually politically difficult to increase tolls or railway fares.

Transport PPPs are more likely to be terminated early and lead to higher fiscal risks from early termination than electricity PPPs. Airport, rail, and road PPPs are about five times more likely to be terminated early than electricity PPPs; port PPPs are as likely to be terminated early as electricity PPPs. The higher likelihood of early termination and the larger average size of transport PPPs lead to higher fiscal risks from early termination of transport PPPs than electricity PPPs. The average fiscal risks are 6-14 percent of the portfolio size in the transport sector and 2-4 percent in the power sector. As a share of the portfolio, the fiscal risks from early termination are larger for transport PPPs than for electricity PPPs in almost all countries studied (figure BO.2.1).







Source: Original figure for this publication.

Note: Fiscal risks are the maximum expected loss over the entire contract period with 99 percent confidence, expressed as a percent of a sectoral portfolio. The estimations assume that the government compensates the private party for 100 percent of the debt and 150 percent of the equity it invested in the project. The estimations for Ukraine do not consider the impact of the Russian invasion. PPP = public-private partnership.

Note: PPP = public-private partnership.

INEFFICIENCIES IN PUBLIC PROVISION LEAD TO FISCAL SURPRISES IN THE NEAR, MEDIUM, AND LONG TERM

Low budget execution, particularly in transport, indicates a potentially significant risk of project delays and cost overruns. In transport, 82 percent of capital spending is made through direct public provision (on budget), 11 percent through SOEs, and 7 percent through PPPs. In electricity, just 9 percent of capital spending is on budget; SOEs and PPPs represent 60 percent and 31 percent of total capital spending, respectively (figure O.8). Underexecution of infrastructure investment budgets, which may signify delays in project implementation and translate into cost overruns, is observed in more than 80 percent of the 65 developing countries in the World Bank's BOOST Database (Foster, Rana, and Gorgulu 2022). The budget execution rate is much higher for road projects (about 69 percent) than for power projects (about 37 percent).

A strong capital bias in road and electricity expenditure leads to growing investment liabilities because of asset deterioration. A regime of undermaintenance and periodic rehabilitation leads to a much higher present value of costs than a regime of prudent preventive maintenance (Labi and Sinha 2003; Burningham and Stankevich 2005). Road spending is strongly skewed toward capital expenditure, with almost all of the



FIGURE 0.8 Shares of capital spending in the power and transport sectors, by modality, 2009–18

Source: Original figure for this publication, based on data from the BOOST, World Bank Infrastructure SOEs, and PPI databases. *Note:* Capital expenditures in PPPs were distributed over a five-year period beginning in the investment year indicated in the PPI Database. Expenditures through direct public provision are for the general government. When data on spending through direct public provision in the power sector were not available for a country in the BOOST data, total energy spending was used. Countries include Albania, Argentina, Bhutan, Bulgaria, Burundi, Ethiopia, Georgia, Indonesia, Kenya, Kosovo, Peru, Romania, Solomon Islands, South Africa, and Ukraine. PPP = public-private partnership; SOE = state-owned enterprise.

46 countries for which data were available spending more on capital expenditures than on maintenance. Indeed, capital bias is so marked that countries spend about seven times as much on investment as maintenance. Countries with road funds spend more on maintenance than their peers, but they still allocate more resources to investment than maintenance (Foster, Rana, and Gorgulu 2022). Power utility SOEs generally handle maintenance. Foster, Rana, and Gorgulu (2022) find that the ratio of capital to maintenance expenditure in electricity exhibits a capital bias in almost all of the countries they study. The bias is less pronounced than for roads.

Road sector expenditure became less productive and more inefficient over the 2006–18 period in many developing countries. Ten of the 18 countries analyzed saw a decrease in the productivity of their road spending—that is, they built fewer kilometers of roads per dollar spent (at constant prices) in 2018 than in 2006.⁴ In some countries, more stringent social and environmental requirements may have driven the change. However, more than half of the countries analyzed experienced a decline in the efficiency of road expenditure, delivering fewer kilometers of roads than comparable countries (countries with the same technology and level of spending) and fewer in 2018 than in 2006. Inefficiency in spending leads to road deterioration, which puts further pressure on growing investment liabilities in many developing countries.

WHEN IT RAINS, IT POURS: FISCAL RISKS FROM INFRASTRUCTURE DURING BAD TIMES

New evidence reveals that on-budget spending on infrastructure was procyclical in 2005–20, suggesting that public infrastructure spending is a soft target for budget cuts. During an economic downturn, on-budget infrastructure spending is expected to be particularly vulnerable to spending cuts, given that it is less socially sensitive than other types of spending; the damage from spending cuts may take years to materialize. Spending cuts can weaken the economic recovery from a recession, including the recession caused by the COVID-19 pandemic. Following the developing country debt crisis of the 1980s, East Asian countries rebounded more quickly than Latin American ones, because East Asia was better able to sustain infrastructure investment than Latin America (Kaminsky and Pereira 1996).

SOEs are sometimes thought to be able to act as countercyclical spending vehicles during a crisis or a severe negative shock, by increasing spending using their own resources. However, a systematic exploration of the effects of negative macroeconomic shocks on infrastructure SOEs' performance undertaken for this report shows that SOEs can increase fiscal risk and amplify negative macroeconomic shocks. Because infrastructure SOEs use most of their revenues to cover payroll, fuel, and maintenance expenses, they have little left over to buffer negative shocks. As a result, a significant negative shock that leads to a deterioration in financial performance prompts affected SOEs to ask for sizable fiscal injections and cut their capital spending.

SOEs that faced a negative shock received increases in fiscal injections as a percent of average assets of 3.5 percent the year after the shock. The increase in fiscal injections is almost 30 percent of the average capital ratio of these infrastructure SOEs—the equivalent of a significant recapitalization the year after the shock. SOEs need fiscal injections precisely when governments are under pressure from the decline in total tax revenues. Probably because of the narrowing fiscal space, fiscal injections take the form of loans from the government and state-owned financial enterprises. As a result, government loans as a percent of SOEs' assets increased by 5.5 percentage points one year after the shock and 4.0 percentage points two years after the shock.

Capital expenditure as a percent of average assets in fully owned infrastructure SOEs decreased by 3.5 percentage points the year after the negative shock. This decline is equivalent to 40 percent of average capital expenditure as a percent of average assets, implying that even after receiving additional fiscal injections, fully owned SOEs cannot keep up with their regular physical investment requirements after a shock. The finding also implies that there may be persistent effects after a shock, at least in the medium term, because a reduction in capital expenditures of fully owned SOEs in affected countries likely leads to a decrease in productivity and operational performance.

A profound macroeconomic crisis also increases the fiscal risks from early termination of PPPs by an order of magnitude immediately after the shock. Early terminations of PPPs are procyclical, because negative macro-financial shocks increase the probability of early termination, which increases fiscal risks. Analysis conducted for this report simulates the impact of a negative macro-financial shock. The simulation assumes a 48.3 percentage point depreciation shock and the occurrence of both a banking and a debt crisis in year 0. Such a profound macroeconomic crisis is similar to some crises in emerging markets and developing economies that led to the early termination of many PPPs.⁵ In the simulation, the year after the shock, the fiscal risks are 11.7–19.2 times the fiscal risks without a shock, depending on the country, with an average ratio of 15.9 (figure O.9).



FIGURE 0.9 Increase in fiscal risks from early termination of PPPs associated with a profound macro-financial shock

Source: Original figure for this publication, based on data from PPI Database, Polity IV Project, World Development Indicators Database, and Laeven and Valencia 2020.

Note: Each data point represents the ratio of fiscal risk from PPPs where there is a severe adverse shock to the fiscal risk when there is no shock. Fiscal risk is measured as the maximum expected losses with 99 percent confidence level from early termination of the PPP portfolio over the period starting in year 0 and ending in the corresponding year. The estimations for Ukraine do not take into account the impact of the Russian invasion. PPP = public-private partnership.

IMPLEMENTING A REFORM AGENDA CAN CREATE SUSTAINABLE FISCAL SPACE FOR INFRASTRUCTURE

Closing the infrastructure gap requires creating sustainable fiscal space for infrastructure. Doing so entails mitigating the fiscal risks from infrastructure to increase the value for money from existing resources and additional capital that need to be mobilized to close the gap. In some countries, it also entails raising additional budget revenues. The reform agenda proposed in this report focuses on mitigating fiscal risks.

The report shows that a combination of vulnerability to exogenous shocks and the prevalence of perverse incentives faced by government officials, SOE managers, and private partners, which lead to moral hazard and principal–agent problems, explain the prevalence of fiscal risks in infrastructure service provision. A reform agenda to mitigate the fiscal risks from infrastructure should aim to create good incentives and mitigate the risks that cannot be eliminated or that the government is best placed to deal with. Creating good incentives requires transparency to observe and control the actions of agents and accountability of government officials, SOE boards and managers, financial institutions, and private partners in PPPs.

All countries are different; the content and pace of implementation of each reform agenda therefore needs to be tailored to the sources of risk and the institutional and socio-political characteristics of each country, as well as the government's capacity. Country-specific strategies will involve different mixes of the preventive and corrective actions presented in this report. However, all reform agendas include four building blocks—integrated public investment management (PIM); effective fiscal and corporate governance of SOEs; robust PPP preparation, procurement, and contract management framework; and integrated fiscal risk management—and grounded in an effort to build adequate government capacity (figure 0.10).

The reform agenda includes both macro-fiscal and infrastructure-specific reforms, with some reforms tied to a particular provision modality and others covering all modalities. Most reforms are broadly applicable to both the electricity and transport sectors, with reforms specific to a provision modality being more relevant to the sector that relies more heavily on that modality.

Integrated public investment management

Mitigating the fiscal risks from infrastructure starts with selecting the right projects and provision modalities. In robust integrated PIM, projects are selected because they are aligned with the country's development goals and yield the highest net benefits; the provision modality is selected based on value for money and fiscal affordability (table O.1), not differential fiscal treatment. Robust integrated PIM requires consistent assessment of all potential projects and consistent fiscal treatment of all projects delivered through direct public provision and PPPs and in some cases also projects delivered by SOEs. To ensure consistent fiscal treatment,



FIGURE 0.10 Building blocks of a reform agenda to mitigate fiscal risks from infrastructure

Source: Original figure for this publication.

Note: SOEs = state-owned enterprises; PPP = public-private partnership.

High-level action	Detailed actions
Implement robust integrated public investment	 Identify, appraise, and select all public infrastructure investment projects together, in accordance with integrated infrastructure plans and strategies and based on robust appraisal methodologies.
management	 Select the best provision modality for each project based on value for money and affordability.
	 Apply IPSAS as the normative accrual accounting framework, and comply with the IMF's Government Finance Statistics Manual 2014 (IMF 2014) and the 2011 Public Sector Debt Statistics: Guide for Compilers and Users (IMF 2011).
	 To guide the annual budget process, prepare rolling MTFFs and MTEFs that are sufficiently disaggregated.
	 To strengthen asset management, implement appropriate asset management systems and create dedicated maintenance funds, such as road funds.
	 Strengthen project implementation process, from procurement to monitoring of the physical and financial execution of projects.
	 Give the ministry of finance a gatekeeping role in the selection of projects, the provision modalities, and renegotiations and modifications of PPP.

TABLE 0.1 Actions for strengthening public investment management

Source: Original table for this publication.

Note: IMF = International Monetary Fund; IPSAS = International Public Sector Accounting Standards; MTEF = medium-term expenditure framework; MTFF = medium-term fiscal framework; PPP = public-private partnership.

the government should apply IPSAS as the normative accrual accounting framework for financial reporting.

Countries should also adopt rolling medium-term fiscal frameworks (MTFFs) and medium-term expenditure frameworks (MTEFs) that include PPPs, in order to ensure proper alignment of investment plans with available funding. Doing so helps reduce the risk that overambitious infrastructure investment plans end up not being implemented and projects are delayed for lack of adequate budgetary resources. Such frameworks also help ensure that funds are available to meet PPP payment obligations.

Adoption of sufficiently disaggregated MTFFs and MTEFs also helps reduce the risks that capital investments are chosen over maintenance spending under direct public provision. Establishing appropriate asset management systems and dedicated maintenance funds, such as road funds, and strengthening project implementation processes, from procurement to monitoring of the physical and financial execution of projects, helps mitigate the risks of asset deterioration and cost overruns under direct public provision.

The effectiveness of integrated PIM rests on granting the ministry of finance the authority to approve investment projects, PPP contracts, and renegotiations and modifications. The ministry of finance is best positioned to decide whether public investment decisions are fiscally sustainable and act as a counterbalance to spending agencies, which usually act as procuring authorities.

Effective fiscal and corporate governance of SOEs

Effective fiscal and corporate governance allows and incentivizes SOE boards and managers to operate the enterprises efficiently, mitigating fiscal risks. Good governance clearly specifies the SOEs' mandates and avoids government interference in the operation of SOEs, particularly

through the imposition of policy mandates or QFOs (table O.2). If, for political reasons, the imposition of QFOs cannot be avoided, SOEs should be compensated in a commensurate, timely, and transparent manner. When there is an independent sector regulator, the ministry of finance and the regulator should work together to determine the appropriate compensation.

Sound financial management systems are key to the good operational and financial performance of SOEs—and therefore to reducing the fiscal risks posed by these enterprises. Accordingly, shareholder governments should take proactive steps to ensure that such systems are in place in their SOEs, regardless of the model of corporate governance and control chosen. Governments should establish clear requirements for their SOEs on all aspects of financial management, including preparation of multiyear business plans and annual budgets; monitoring of the execution and, if needed, revision of both; accounting and reporting; internal and external auditing; and asset-liability management. Governments should also monitor and enforce SOEs' compliance with such requirements.

Many of the considerations regarding the management of public investments also apply to investments by SOEs, particularly regarding project appraisal and selection and the maintenance of existing infrastructure. Sound corporate and fiscal governance is key to generating the right incentives for SOEs to adopt and consistently use strong investment management systems and practices.

To mitigate fiscal risks, it is essential that SOEs' access to financing be contained within limits consistent with their debt-servicing capacity, in both the short and the long term. For this purpose, governments should eliminate preferential channels or terms of access of SOEs to financing and introduce transparent, nondiscretionary, and effective systems of control of

High-level actions	Detailed actions
Reduce the risk from quasi-fiscal activities	 Avoid the imposition of quasi-fiscal burdens on SOEs. When quasi-fiscal activities cannot be avoided, quantify them and compensate the SOE from the budget for undertaking them.
Strengthen SOEs' financial management and monitoring	 Establish clear requirements for SOEs on the preparation of multiyear business plans and annual budgets, the monitoring of execution of both, accounting and reporting, and internal and external audits.
Limit SOEs' access to financing based on their debt-servicing capacity	 Introduce transparent, nondiscretionary systems of control of SOE borrowing, focused primarily on solvency and liquidity criteria.
	End policies that give SOEs preferential access to financing.
	 Limit the granting of explicit guarantees to SOEs to the financing of investment projects of clear public interest.
Avoid excessive and discretionary resource extraction from SOEs	 Subject SOEs to the same tax regime as other enterprises in the same sector.
	 Provide guidance on SOEs' expected rates of return and the distribution of dividends and reinvestment in the firm.

TABLE 0.2Actions for improving the effectiveness of the fiscal and corporate governance
of SOEs

Source: Original table for this publication. *Note:* SOE = state-owned enterprise.

SOEs' borrowing, focused primarily on solvency and liquidity criteria. The granting of explicit guarantees to SOEs should be strictly limited to the financing of investment projects of clear public interest, subject to an aggregate ceiling and granted based on the SOE's capacity to service the debt.

To reduce the risks from excessive extraction of resources from their SOEs—which is often dictated by short-term budgetary pressures—governments should subject them to the same tax and royalty regimes as other enterprises operating in the same sector. They should also provide guidance about expected rates of return and the distribution of dividends and reinvestment in the firm.

A robust PPP framework

A PPP framework that optimally allocates risk and limits opportunistic behavior is needed to mitigate the risks from renegotiation and early termination of PPPs. A robust preparation framework should avoid allocating demand risk to the private partner when it has minimal or no control over demand (table O.3). Flexible-term contracts, such as present-value-of-revenue contracts, are a good option for allocating demand risk to the government in such cases. Measures to reduce financing risk—such as providing support through capital grants, revenue subsidies, or in-kind transfers—can help reduce the risk of early termination.

A procurement process that awards the PPP to the private partner that can deliver the highest value for money can help mitigate fiscal risks. Because of the uncertainties around infrastructure projects, and PPPs in particular because of their long-term nature, it is important that the government provide as much information as possible on the project. Low transactions costs, clarity, fairness, and transparency of the procurement process can also help attract competition and ensure an efficient outcome.

High-level actions	Detailed actions
Implement a robust preparation framework	• Avoid allocating demand risk to the private partner when it has minimal or no control over demand.
	 Consider reducing the financing risk of PPPs by, for example, providing support through capital grants, revenue subsidies, or in-kind transfers.
Implement an efficient procurement framework	 Provide as much information as possible on the project to reduce uncertainty about the value of the project and ensure an efficient outcome.
	 Reduce transactions costs, and ensure clarity, fairness, and transparency of the procurement process.
Implement an effective contract	Establish alternative dispute-resolution mechanisms.
management framework	Regulate contract renegotiations and modifications.
	 Regulate causes that justify early termination and its associated consequences.

TABLE 0.3 Actions for developing a robust framework for PPPs

Properly managing the implementation of a PPP contract is key to ensuring that the project delivers the expected value for money and fiscal risks are properly managed. Modification and renegotiation of the contract should be regulated, with only a narrow set of reasons allowed as justification for renegotiation. It is advisable that when renegotiations exceed specific thresholds or the scope of work is increased, a new tendering process be implemented to support competition and reduce incentives for renegotiation. Specific circumstances that may arise during the life of the contract should also be regulated, and mechanisms should be in place that allow the parties to resolve disputes without adversely affecting the project. To reduce the fiscal costs from early termination, the grounds for termination of the PPP contract and its associated consequences should be well defined (World Bank 2020).

Integrated fiscal risk management

There are risks that cannot be eliminated or that the government is best placed to deal with. They must be properly managed. Because of potential interactions among different risks and portfolio effects, integrated risk management—the management of risk across government, sectors, and provision modalities—will increase the efficiency of outcomes. A well-functioning fiscal risk management system should provide the right information to the right people at the right time. Doing so requires a fiscal risk management system that can identify, analyze, and disclose fiscal risks; incorporate them in the budget; mitigate them; and monitor and review them. Most of these tasks are best handled in a centralized manner, by either the ministry of finance or a high-level interagency committee chaired by it (table O.4).

Transparency is a central tenet of proper fiscal management. Transparency on public spending, public debt, SOE operations and liabilities, and PPP fiscal commitments and contingent liabilities can create stronger incentives to ensure that all risks are identified, quantified, and carefully managed. Transparency allows civil society to keep the government accountable. Progress has been made in recent years, but there are still significant actions that governments can take to improve debt transparency and the disclosure of fiscal risks.

Mitigating fiscal risks entails reducing potential risks before they are taken on or materialize and reducing the cost once a risk materializes. Mitigating fiscal risks from infrastructure starts with sound macroeconomic and debt management to reduce a country's vulnerability to

High-level action	Detailed actions
Implement integrated fiscal risk management	 Create a central institutional structure, within or chaired by the ministry of finance, in charge of managing all fiscal risks, including from infrastructure.
	 Improve debt transparency, including by publishing statistics on core public and publicly guaranteed debt annually, and disclose comprehensive information on fiscal risks.
	Undertake sound macroeconomic and debt management.
	Mitigate the fiscal impact of climate risk.

Source: Original table for this publication.

crises and the need to support SOEs and cover explicit and implicit contingent liabilities from PPPs.

Mitigating risks from natural disasters, particularly disasters related to extreme weather events, requires integrated approaches. Sometimes the assets most at risk can be relocated or strengthened. Some climate risk can be insured against, either through explicit insurance policies for physical infrastructure or through national disaster funds. Because of the increased variability in weather patterns and severity of extreme events, some insurance mechanisms may be insufficient to cover unexpected costs, however, especially in countries with no disaster relief endowments. Fiscal planning should therefore incorporate assessments of the fiscal impact of climate change to mitigate it.

Government capacity

Mitigating fiscal risks from infrastructure requires adequate government capacity. Governments need to develop the databases and staff capacities needed to appraise, select, procure, implement, and manage public investment projects, including PPPs (table O.5). In the case of SOEs, it is important to endow the oversight authority with adequate human resources and information systems to enable it to monitor and enforce compliance with budgeting and reporting requirements, analyze such budgets and reports, and request and enforce appropriate corrective actions. Governments must develop the capacity to structure and manage PPPs over their lifetime. Managing PPPs is different from managing typical construction contracts; not all emerging market and developing economies are able to do so. The contract management authority should be endowed with adequate human resources and systems to manage PPP contracts, including risk mitigation mechanisms.

The ministry of finance needs the capacity to analyze fiscal risks in an integrated manner in order to incorporate them into overall fiscal analysis. Approaches and tools to estimate the fiscal risks from contingent liabilities from PPPs and SOEs can be used as part of an integrated analysis. Examples include the value-at-risk method used in this report for contingent liabilities from early termination of PPPs (chapter 4), which can be used for other contingent liabilities as well; the Z" score for contingent liabilities from SOEs (chapter 3); and the PPP Fiscal Risk Assessment Model (chapter 4).

High-level action	Detailed actions
Develop adequate government capacity	 Implement clear and robust project appraisal and selection methodologies for all public investment projects, including PPPs.
	 Invest in the development of the required databases, tools, and staff capacities to undertake appraisal, selection, procurement, implementation, and management of public investment projects, including PPPs.
	 Endow the SOE oversight authority with adequate human resources and information systems to monitor SOEs.
	 Invest in the development of the required databases, tools, and staff capacities to assess fiscal risks from infrastructure.

TABLE 0.5 Actions for strengthening government capacity to mitigate fiscal risks

Source: Original table for this publication.

Note: PPP = public-private partnership; SOE = state-owned enterprise.

NOTES

- 1. See appendix A for a description of the databases used.
- 2. This measure of fiscal injections is intended to capture fiscal transfers that increase involvement in the financing of the operation of the SOE only rather than transfers that fund investments. SOEs can account for financial support from the government in other ways as well. For instance, governments can support SOEs through increases in trade payables payable to another SOE. As not all trade payables can be identified as government support, the methodology errs on the side of caution, underestimating fiscal injection ratios by leaving out trade payables from the calculations.
- 3. The figures from Chile are the cost of additional works agreed through renegotiation and so should be interpreted as lower bounds of the fiscal costs from renegotiations, as no concessionaire would agree to additional works unless it is compensated for the additional cost and it is possible that the government ended up overcompensating the concessionaire, given the stronger bargaining power of the latter. The figures from Peru are actual government payments, including payments to concessionaires and for land acquisitions because of changes in the scale and scope of PPP projects.
- 4. The sample includes Afghanistan, Bulgaria, Burkina Faso, Costa Rica, Ethiopia. Guatemala, Kenya, Kosovo, Macedonia, Mauritius, Mexico, Namibia, Niger, Paraguay, Peru, Senegal, Tanzania, and Tunisia.
- 5. The systematic banking crises dataset of Laeven and Valencia (2020) identifies 104 banking crisis episodes among the countries included in the PPI Database, 13 of which also involved sovereign debt and currency crises. During these 13 episodes, the maximum annual deviation in the depreciation rate from its long-run average ranged from 15.1 to 116.0 percentage points, with an average of 48.3 percentage points.

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OFF the **BOOKS**

Developing countries face massive infrastructure needs, but public spending on infrastructure is inadequate, and public investment has been declining in recent years. Rising debt levels and tightening fiscal and monetary conditions are putting further pressure on the funds available for infrastructure, heightening the importance of increasing the efficiency of infrastructure spending.

Off the Books: Understanding and Mitigating the Fiscal Risks of Infrastructure shows that however governments deliver infrastructure—through direct public provision, state-owned enterprises (SOEs), or public-private partnerships (PPPs), the risk of fiscal surprises is high in both good times and bad. As a result, infrastructure service delivery often ends up costing significantly more than expected, eroding limited fiscal space for productive spending.

This book makes a unique contribution by quantifying the magnitude and prevalence of fiscal risks from electricity and transport infrastructure and identifying their root causes across a range of low- and middle-income countries. Drawing on important new sources of evidence and compiling many others, the analysis sheds light on how much is at stake in the good governance of infrastructure sectors. It allows policy makers to weigh the magnitudes of different types of risks and examine how they vary across contexts.

Off the Books shows how a deeper understanding of the fiscal risks of infrastructure can help policy makers target reforms to areas where they can be expected to have the greatest impact. It lays out a reform agenda for mitigating the fiscal risks associated with infrastructure based on building government capacity; adopting integrated public investment management and integrated fiscal risk management; improving fiscal and corporate governance of SOEs; and ensuring robust PPP preparation, procurement, and contract management. The book will be of enormous value to policy makers, practitioners, and academics who have an interest in infrastructure and fiscal policy.





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