



MULTILATERAL
COOPERATION CENTER
FOR DEVELOPMENT FINANCE

SUSTAINABLE FINANCING OF DEVELOPMENT AND INFRASTRUCTURE

A Handbook for Borrowers and Lenders

Edited by:
Marcelo M. Giugale



© 2022 Multilateral Cooperation Center for Development Finance (MCDF)

Asian Infrastructure Investment Bank (Administrator of MCDF)
Tower A, Asia Financial Center, No.1 Tianchen East Road,
Chaoyang District
Beijing, China 100101
Tel: +86-10-8358-0000
secretariat@themcdf.org

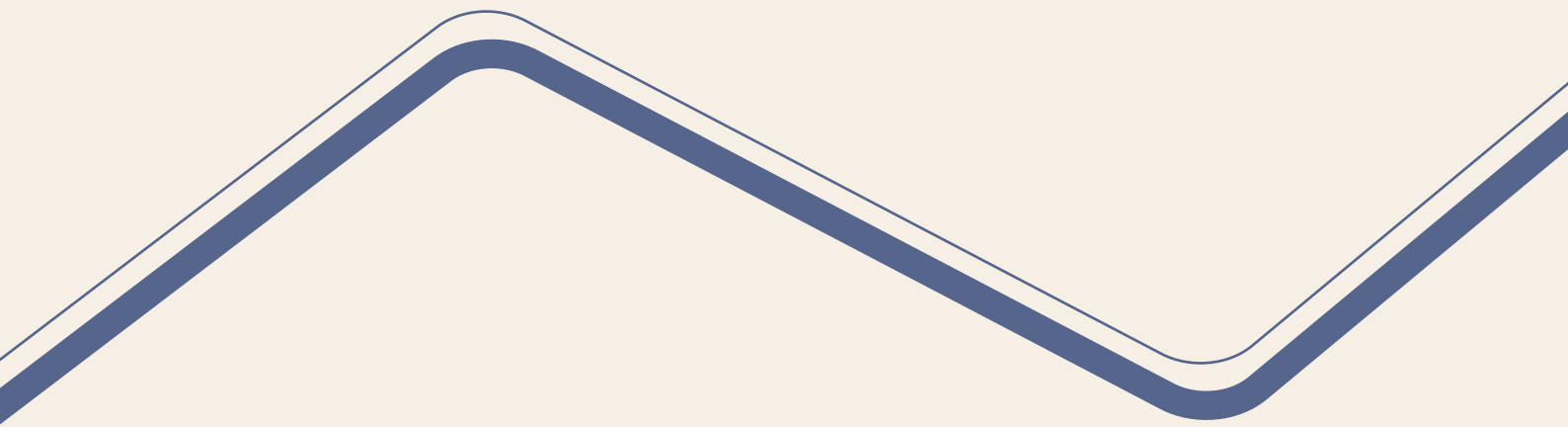
CC BY-NC-ND 3.0 IGO. The content of this publication is subject to
copyright with some rights reserved. Standard disclaimer applies:
www.themcdf.org/en/general/disclaimer/index.html



SUSTAINABLE FINANCING OF DEVELOPMENT AND INFRASTRUCTURE

A Handbook for Borrowers and Lenders

Edited by:
Marcelo M. Giugale



Contents

<i>Abbreviations</i>	<i>ix</i>
<i>Foreword</i>	<i>xi</i>
<i>Acknowledgments</i>	<i>xiii</i>
<i>Synthesis</i>	<i>1</i>
Chapter 1: Debt Dynamics and Sustainability	28
Chapter 2: Formulating a Debt Management Strategy	106
Chapter 3: Annual Borrowing Plan and Issuance of Debt Instruments	132
Chapter 4: Old and New Instruments for Public Debt Management	153
Chapter 5: Old and New Instruments for Fiscal Risk Management	191
Chapter 6: Contingent Liabilities and “Hidden Debt”	218
Chapter 7: Financing Options for Infrastructure Projects, with an Emphasis on Public-Private Partnerships	243
Chapter 8: Legal Aspects of External Debt and Lending	265
Chapter 9: Debt Accounting, Reporting and Disclosure	299
Chapter 10: Institutional Arrangements for Public Debt Management	321
<i>About the Authors</i>	<i>349</i>

List of Figures, Tables and Boxes

Chapter 1

Figures

Figure 1.1. Macroland Government's Debt Indicators—Baseline Scenario	51
Figure 1.2. Macroland Government's Debt Dynamics Decomposition—Baseline Scenario	60
Figure 1.3. Macroland Government's Debt Dynamics Decomposition—Revisited	63
Figure 1.4. Public Debt Ratios	65
Figure 1.5. Macroland Government's Debt-to-GDP Ratio—Baseline and Alternative Scenarios	70
Figure 1.6. Macroland Government's Debt-to-GDP Ratio and Intertemporal Budget Constraint	73
Figure 1.7. Macroland Government's Debt Targets and Required Fiscal Adjustment.	76
Figure 1.8. Frameworks for Debt Sustainability Analysis	79
Figure 1.9. Sovereign Risk and Debt Sustainability Framework Thresholds	83
Figure 1.10. Market-Access Country Debt Sustainability Analysis Vulnerability Indicators	85
Figure 1.11. Low-Income Country Debt Sustainability Framework Thresholds	87

Tables

Table 1.1. Macroland Government's Fiscal, Financing and Debt Data	32
Table 1.2. Macroland Government's Macroeconomic, Fiscal, Financing and Debt Data	37
Table 1.3. Macroland Government's Flow of Funds and Debt Dynamics	40
Table 1.4. Macroland Government's Flow of Funds and Debt Repayments	44
Table 1.5. Macroland Government's Debt Dynamics—Baseline Scenario	50
Table 1.6. Macroland Government's Debt Dynamics Decomposition—Baseline Scenario	58
Table 1.7. Macroland Government's Debt Dynamics Decomposition—Revisited	62
Table 1.8. Public Debt Levels and Ratios	64

Chapter 2

Figures

Figure 2.1. Factors Determining the Design of a Debt Management Strategy	111
Figure 2.2. Redemption Profile in Sierra Leone as of the End of 2020	113
Figure 2.3. Uruguay Foreign Exchange Debt and Spread over United States Treasury Bills	114
Figure 2.4. Change in Uruguay's Redemption Profile, 2004-2010	115
Figure 2.5. Management of Interest-Rate Risk in the Czech Republic	118
Figure 2.6. Monitoring Foreign-Currency Risk in Romania	120
Figure 2.7. Illustration of Debt-Servicing Flows of a Strategy under a Baseline and a Risk Scenario	124
Figure 2.8. Structure of a Simulation Model to Compute a Debt Management Strategy's Cost and Risk	124
Figure 2.9. Illustration of Cost and Risk of Alternative Debt Management Strategies	125

Tables

Table 2.1. Public Debt Management Strategy in Latvia 2021	108
Table 2.2. Public Debt Management Strategy in Bhutan 2021	109
Table 2.3. Macroeconomic Risks and Debt Management Strategies	129

Chapter 3

Figures

Figure 3.1. Number of Issues and Outstanding Volume (as of June 2021)	139
Figure 3.2. Diversified Investor Base	145
Figure 3.3. Reasons for International Bond Issuance and Underlying Dynamics	148
Figure 3.4. Major Risks and Mitigation Tools	149

Tables

Table 3.1. Financing Needs	134
Table 3.2. Funding Sources	137
Table 3.3. Liability Management Operations in the Organization for Economic Co-operation and Development Area	140
Table 3.4. Wholesale Issuance Techniques in the Organisation for Economic Co-operation and Development Area	141

Boxes

Box 3.1. Uruguay: Annual Borrowing Plan	134
Box 3.2. Brazil: Borrowing Requirement	135
Box 3.3. Italy: Variants of Issuance Techniques	142

Chapter 4

Figures

Figure 4.1. Debt Buyback	155
Figure 4.2. Debt Swap	157
Figure 4.3. Debt Swap and Buyback Decision Tree	158
Figure 4.4. Over-the-Counter Derivatives Market: Notional Outstanding	160
Figure 4.5. Evolution of the Environmental, Social and Governance and Thematic Bond Market Yearly Issuance (USD billion)	163
Figure 4.6. Global Bond Issuance: Outstanding Balance by Year (USD billion)	164
Figure 4.7. Overview of Major Steps in a Thematic Bond Issuance	165
Figure 4.8. Framework for Environmental, Social and Governance Bonds	166
Figure 4.9. Green Bond Milestones	167
Figure 4.10. Green Bond Issuance: Cumulative Issuance	169
Figure 4.11. Green Bond Issuance: Yearly Issuance by Issuer Type	169
Figure 4.12. Green Bond Issuance: Issuance Over Time by Region	170
Figure 4.13. Green Bond Issuance: Cumulative, by Issuing Country	171
Figure 4.14. Credit Rating of Green Bonds Over Time	172
Figure 4.15. Green vs. Plain Bond Spreads	173
Figure 4.16. Selected Market Views on the “Greenium”	173
Figure 4.17. Social Bonds: Issuance by Region and Issuer Type (USD billion)	175
Figure 4.18. Social Bonds: Cumulative Issuance by Country, Top Issuers	176
Figure 4.19. Sustainability Bonds, by Issuer Type and Country (USD billion)	180
Figure 4.20. Eni Sustainability-Linked Bond Second Party Opinion	182
Figure 4.22. Sukuk Bonds: Issuance by Issuer Type	185
Figure 4.23. Sukuk Bonds: Share of Market by Issuing Country	185
Figure 4.24. Catastrophe Bonds: Amounts Issued and Outstanding per Year	186

Tables

Table 4.1.	Main Risks Affecting Debt Portfolios and Financial Operations	159
Table 4.2.	Terms of the World Bank's Two Main Contingent Financing Instruments	161
Table 4.3.	Different Types of Green Bond Structures	168
Table 4.4.	Recent Blue Bond Issuances	177
Table 4.5.	Islamic Financing Techniques	184

Boxes

Box 4.1.	Brady Bonds: Precursor to Debt Swaps and Buybacks?	156
Box 4.2.	Seychelles: Issuer of the World's First Blue Bond	176
Box 4.3.	IDB Invest's Gender Bond	178
Box 4.4.	Eni Sustainability-Linked Bond	181
Box 4.5.	World Bank Pacific Alliance Catastrophe Bond	187
Box 4.6.	Special Considerations for Infrastructure Financiers	188

Chapter 5**Figures**

Figure 5.1.	International Architecture for Development Finance	195
Figure 5.2.	Interest Rate Swap	203
Figure 5.3.	Currency Swap	204
Figure 5.4.	Currency Swap	205
Figure 5.5.	ANCAP Commodity Hedging	207
Figure 5.6.	Natural Disaster Financing Phases	209
Figure 5.7.	Natural Disaster Financing Options	210
Figure 5.8.	Philippines Catastrophe Insurance	211
Figure 5.9.	Pacific Catastrophe Risk Insurance Pilot	212
Figure 5.10.	Uruguay's Weather and Oil Insurance	213
Figure 5.11.	Pacific Alliance Catastrophe Bond	214

Tables

Table 5.1.	Alternative Reference Rates	200
------------	-----------------------------	-----

Boxes

Box 5.1.	Interest Rate Swap	196
Box 5.2.	Currency Swap	197
Box 5.3.	Commodity Swap	198
Box 5.4.	Disaster Risk Management Swap	199
Box 5.5.	Hypothetical Infrastructure Project	203

Chapter 6**Figures**

Figure 6.1.	Contingent Liability Realizations, by Year and Type	220
Figure 6.2.	Fiscal Risk Management Cycle	221
Figure 6.3.	International Monetary Fund Fiscal Risk Toolkit	223
Figure 6.4.	Generic Approaches to Mitigating Fiscal Risks from Contingent Liabilities	224
Figure 6.5.	Stock of Government Guarantees in European Countries, 2015	226
Figure 6.6.	Generic Approaches to Managing Fiscal Risks from Guarantees	229

Figure 6.7.	Liabilities of Financial and Nonfinancial Public Corporations in Europe, 2015	234
Figure 6.8.	Generic Approaches to Managing Fiscal Risks from State-Owned Enterprises and Public Financial Corporations	235
Figure 6.9.	The Increasing Incidence of Disasters	236

Tables

Table 6.1.	Contingent Liability Realizations	220
Table 6.2.	Odisha Fiscal Risk Register	222
Table 6.3.	Different Approaches to Managing Subnational Fiscal Risks	237

Boxes

Box 6.1.	Criteria for Assessing the Justification for a Guarantee	227
Box 6.2.	Types of Government Contingent Liabilities in Public-Private Partnerships	232
Box 6.3.	Criteria for Evaluating and Reforming Extra-Budgetary Funds	239

Chapter 7

Figures

Figure 7.1.	Classification of Risk Mitigation Instruments along Three Key Dimensions	250
Figure 7.2.	Typology of Infrastructure Projects, Costs Compared with (Market) Values	252
Figure 7.3.	Typical Project Structure	257
Figure 7.4.	Typical Flow of Funds	258

Boxes

Box 7.1.	Capital Markets and Infrastructure Financing	254
Box 7.2.	Additional Readings	263

Chapter 8

Boxes

Box 8.1.	The Risk of Having Sovereign Bonds Governed by the Domestic Law of the Issuer	275
Box 8.2.	The <i>pari passu</i> : Covenant and the Case against the Republic of Argentina	276
Box 8.3.	Financing Jargon	277
Box 8.4.	Lenders Beware: Structural Subordination	280
Box 8.5.	Customary Basic Representations and Warranties	283
Box 8.6.	Commonly Used Financial Covenants	284
Box 8.7.	Typical Events of Default	285
Box 8.8.	Cross-Default Clauses	286

Chapter 9

Figures

Figure 9.1.	Role of Accounting in Fiscal Management	301
Figure 9.2.	Spectrum of Debt Reporting	305
Figure 9.3.	Accountability in the Governance Framework of Public Debt Management	306
Figure 9.4.	Importance of Comprehensive, Timely and Reliable Debt Data	310
Figure 9.5.	Processes of Operational Risk Management	313
Figure 9.6.	Operational Risk Exposure Matrix	313

Tables

Table 9.1.	Valuation of Debt Instruments	303
Table 9.2.	Disclosure Practices of Contingent Liabilities in Selected Countries	309

Boxes

Box 9.1.	Türkiye: Setting Public Sector Accounting Standards in Debt Management	302
Box 9.2.	France: Ensuring Debt Transparency	307
Box 9.3.	Mozambique: Undisclosed State-Owned Enterprise Debt	308
Box 9.4.	Brazil: Integrated Public Debt System	311
Box 9.5.	Australia: Predictability of Operational Risks	313
Box 9.6.	New Zealand: Performance Audit	315

Chapter 10**Figures**

Figure 10.1.	Policy Interdependencies and Tradeoffs	328
Figure 10.2.	Overview of Budget Execution and Financing	330
Figure 10.3.	Internal Structure of the Debt Management Office	333
Figure 10.4.	Risk Exposure Matrix	337
Figure 10.5.	Changes in Debt Management Performance Assessment Scores for 37 Low-Income and Lower-Middle-Income Countries	346

Tables

Table 10.1.	Policy Objectives and Tools	328
Table 10.2.	Additional Functions Required in a Debt Management Office and Their Locations	334
Table 10.3.	Investor Relations Tools and Activities (except websites)	341
Table 10.4.	Debt Management Performance Assessment Indicators	343

Abbreviations

ABP	annual borrowing plan
ABS	asset-backed security
ATM	average time to maturity
ATR	average time to refixing
BIS	Bank for International Settlements
BOOT	build-own-operate-transfer
BOT	build-operate-transfer
BTO	build-transfer-operate
CAT	Catastrophe
CBI	Climate Bonds Initiative
CL	contingent liability
COVID-19	coronavirus disease
DBFOM	design-build-finance-operate maintain
DCMF	design-construct-manage-finance
DDT	Debt Dynamics Tool
DeMPA	Debt Management Performance Assessment
DMIS	debt management information system
DMO	debt management office
DPI	debt performance indicator
DPL-DDO	development policy loan—deferred draw-down option
DRM	disaster risk management
DSA	debt sustainability analysis
EBF	extra-budgetary funds
ESG	environmental, social or governance
EU	European Union
EURIBOR	Euro Interbank Offered Rate
FX	foreign currency
GDP	gross domestic product
GFN	gross financing needs
GoS	government securities
GRGDP	growth rate of nominal GDP
ICMA	International Capital Market Association
IFC	International Finance Corporation
IFI	International Financial Institution
IMF	International Monetary Fund
IPSAS	International Public Sector Accounting Standards
IPSASB	International Public Sector Accounting Standards Board
ISDA	International Swap and Derivatives Association
ISSAI	International Standards of Supreme Audit Institutions
IT	information technology
KPI	key performance indicator
LIBOR	London Inter-Bank Offered Rate
LIC DSF	World Bank's Low-Income Country Debt Sustainability Framework
LMO	liability management operations
LX	local currency
MAC	Market Access Countries

MCDF	Multilateral Cooperation Center for Development Finance
MFI	multilateral financial institution
MOF	ministry of finance
NDB	national development bank
NIB	national infrastructure bank
O&M	operation and maintenance
OECD	Organisation for Economic Co-operation and Development
OTC	over the counter
PB	primary balance
PCG	partial credit guarantee
PDM	public debt management
PEFA	Public Expenditure and Financial Accountability
PPG	public and publicly guaranteed
PPI	private participation in infrastructure
PPP	public-private partnership
PRG	political risk guarantee
ROT	rehabilitate-operate-transfer
S&P	Standard and Poor's
SDG	Sustainable Development Goal
SIAFI	Integrated System of Financial Administration
SNG	subnational government
SOE	state-owned enterprise
SOFR	Secured Overnight Financing Rate
SPT	sustainability performance target
UK	United Kingdom
UN	United Nations
US	United States

Foreword

Financing sustainable development is a team effort. Multilateral institutions, bilateral aid agencies, national development banks, lenders, foundations and many others contribute capital to help developing countries turn poverty into prosperity. While the objective is common to all, each financier has its own governance, mandate, strategies and systems. Achieving the objective calls for close and constant coordination if the total is to be more than the sum of the parts.

Coordination is still a work in progress. Aligning financial support from different sources behind the homegrown visions of individual countries is not easy, and making that support sustainable across time and natural resources is even less so. The Multilateral Cooperation Center for Development Finance (MCDF) was created to facilitate that alignment in one specific aspect of the development process: the funding of high-quality infrastructure and connectivity investments.

Since it opened its doors in 2020, MCDF has provided both a platform where development financiers and their clients can share investment opportunities and knowledge of international standards and best practices, and a fund to finance the preparation of projects and capacity building. Despite the enormous pent-up demand for connectivity infrastructure, the target is more than just the quantity of projects. The target is also project quality. Every project—and the financing that goes with it—must answer three questions: Will it improve people's lives? Will the improvement respect and preserve the environment? Will it be financially sustainable?

The handbook deals with the last question, which has become increasingly important in recent years as developing countries face heightened risks of debt distress. The handbook is a byproduct of—and a tool for—MCDF's Workshop Series on Sustainable Financing for Development and Infrastructure, a 10-module capacity-building program launched in 2021 and delivered by some of the best practitioners in the profession. The handbook and the series contain state-of-the-art information on the entire debt process, from how, when and how much countries should borrow to how they should organize themselves to ensure borrowing does not become a problem. But, for all their technical content, the handbook and series attempt to bring official borrowers and lenders together and onto the same page. In other words, the handbook and series build the capacity to generate mutual understanding and, ultimately, better outcomes for all.

A key objective of the knowledge products that MCDF supports is to put down in writing the international best practices and standards that are communicated at our events, not only to assist the original participants further but also to disseminate the content to new audiences. I hope the handbook succeeds in doing so for sustainable financing development and infrastructure.

Finally, I sincerely thank Marcelo M. Giugale for his leadership in designing and directing the workshop series and expertly editing the publication.



Zhongjing Wang
Chief Executive Officer
Multilateral Cooperation Center
for Development Finance

Acknowledgments

The handbook is the product of extensive collaboration among some of the brightest minds in development finance. The list of gratitude starts with the instructors at the Multilateral Cooperation Center for Development Finance (MCDF) Workshop Series on Sustainable Financing for Development and Infrastructure: Phillip Anderson, M. Coşkun Cangöz, Antonio Davila, Marcelo M. Giugale, Ede Ijjasz, Kanyi Lui, Tomas Magnusson, Murray Petrie, Luis de la Plaza, Juan Pradelli and Antonio Velandia. They generously put down on paper—and in a language accessible to all—the state-of-the-art knowledge that they delivered in their respective modules of the series. Their chapters truly summarize the frontier of the practice.

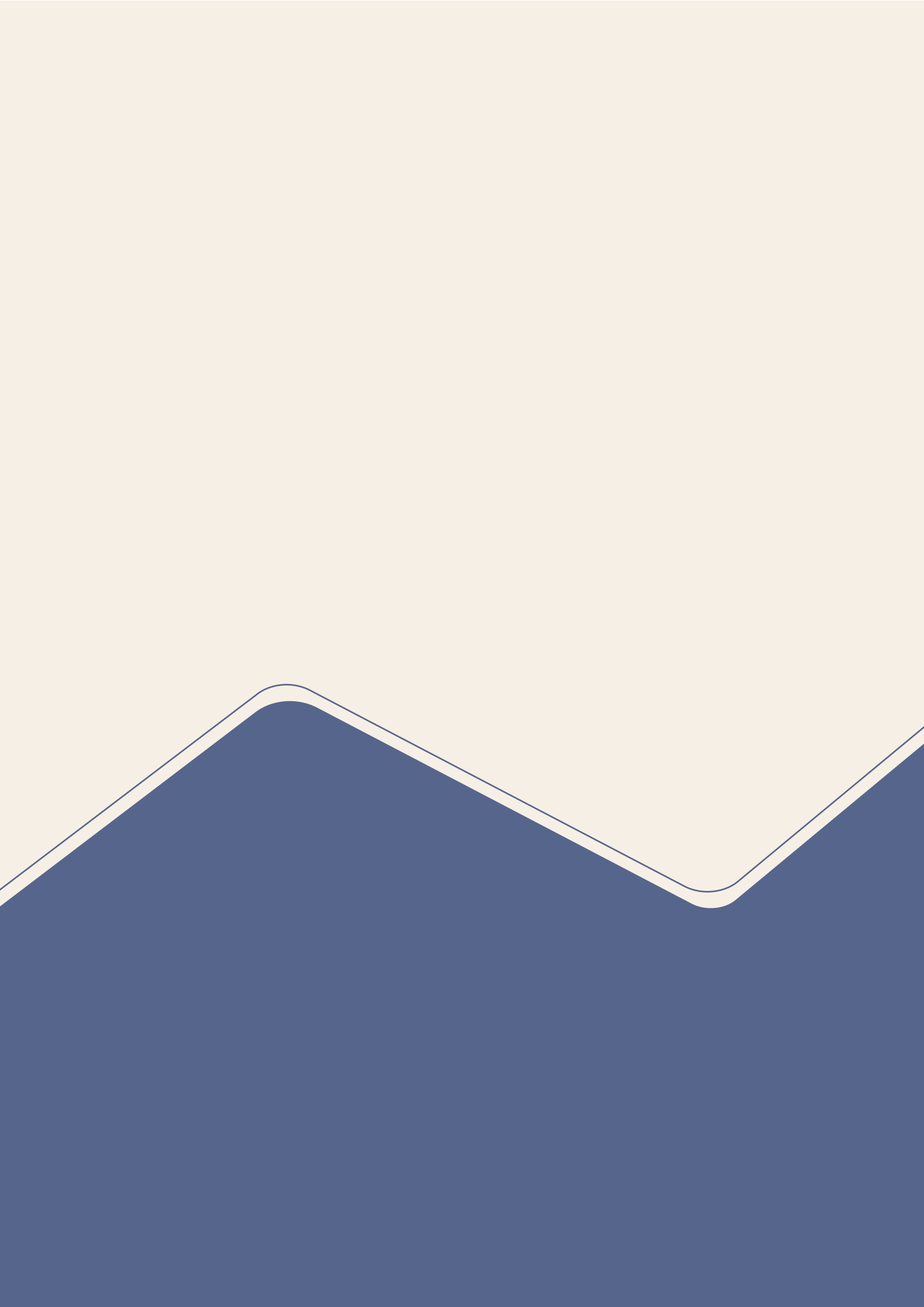
Our instructors were ably guided and supported by the Platform Team of the MCDF Secretariat: Strahan Spencer, Omar Ezzat, and especially Xin Zhang and Victoria Goettlicher, who effectively task-managed the overall production process. Our copy editor Muriel Ordoñez tirelessly worked her magic to make our writing not just readable but enjoyable. Maria Guardia Marin was our graphic designer and creator of the volume's beautiful cover.

Early drafts of the handbook were discussed in technical seminars held during July and August 2022, at which excellent comments and suggestions were received from seminar participants and our external peer reviewers: Santiago Acosta, Christopher Damandl, Benno Ferrarini, Azzedine Lazizi, Jason Zhengrong Lu, Jen Jung Eun Oh, Leandro Puccini Secunho, Mohsin Sharif, Ian Storkey and Chrystol Thomas.

Finally, we owe special gratitude to Zhongjing Wang, MCDF's chief executive officer, for supporting the workshop series from which the handbook originated.

Marcelo M. Giugale

Senior Advisor to the Chief Executive Officer
Program Director of the Workshop Series for
Sustainable Financing for Development and Infrastructure
Multilateral Cooperation Center for Development Finance



Synthesis

Marcelo M. Giugale

1. Introduction

Debt has become a global priority again. Early in 2022, the data showed that 60% of low-income countries were in or near debt distress, and a dozen emerging and developing economies faced default. Worse, not all creditors were donors and multilaterals, the type that gave up their claims in the past. They were also bondholders and banks, which recoil at relief.

In a way, this is not surprising. Debt burdens were high before the coronavirus disease (COVID-19) pandemic, ballooned in its aftermath and are projected to keep growing due to the massive need for infrastructure. Surprising is how the build-up can become unsustainable again without governments and financiers adjusting their behaviors. Do borrowers and lenders have the same information when they sign a loan agreement or issue a bond? Do they have the same capacity and methods to assess debt sustainability? Do they understand each other's incentives, constraints and decision-making? Clearly not. And they pay a high price for the asymmetry.

Fortunately, that is a problem that can be solved. An experiment by the Multilateral Cooperation Center for Development Finance (MCDF) has shown a way forward. In November 2021, together with the Asian Infrastructure Investment Bank's Economics Department, MCDF launched the Workshop Series on Sustainable Financing for Development and Infrastructure. The 10-module capacity-building initiative heeded the lessons from similar experiences of the International Monetary Fund (IMF), the World Bank and the Organization for Economic Co-operation and Development (OECD). But the series has been unique and unprecedented in two ways.

First, it was offered to and attended by borrowers *and* lenders. They came from public debt management offices (DMOs) and multilateral and state-owned banks. Those practitioners—more than 300 from some 60 countries—sit on opposite sides of the finance table. But they all have the same objective: sustainable prosperity. Second, the series' content covered the *entire* debt process, from its macroeconomic genesis, medium-term strategies and annual borrowing plans (ABPs) to its accounting, reporting, legal and institutional arrangements. No wonder the 10 modules had to be spread over six months.

The results were eye-opening. Borrowers valued the comprehensive nature of the series; there cannot be skills gaps if debt is to be sustainable. Lenders valued understanding—in some cases for the first time—the context in which public debt managers operate and why they act the way they do. And borrowers and lenders confirmed what has long been suspected: the evidence does not bear out the assumption that, at the time of lending, creditors and debtors have the same

relevant information. Even for public debt offices that dutifully publish their debt sustainability analyses, medium-term strategies and ABPs, the documents' mechanics and parameters are not always understood by or available to all parties. Transparency *ex ante* is as essential as transparency *ex post*. That is why capacity-building programs catering to both sides of the debt contract can have a powerful impact.

This handbook is a supporting tool for MCDF's workshop series and one that participants identified as essential. It is a written record of the knowledge conveyed, instructional material for those who attend the workshops and a stand-alone reference for those who do not.

The 10 chapters are by the workshop series instructors. They are renowned in their fields, long experienced in managing public debt and building capacity worldwide. Their approach is practical. Rather than presenting original research, they share what is known about development and infrastructure financing, its established international standards and how it can be applied to make public debt more sustainable: What needs to be done, how it is done and what the good practices are.

The wide thematic span of the workshop series is maintained here, from macro frameworks to institutions and from ABPs to the reporting of debt. So is the focus on a joint audience of borrowers and lenders. Plenty of country examples and case studies are presented, not as blueprints to be followed but as indicators of what is possible or not possible. They come from advanced, emerging and developing economies alike. After all, debt crises have happened in countries rich and poor. Infrastructure is emphasized because it is central to development and requires financing.

This synthesis summarizes the handbook, distilling the substance of each chapter and putting it into a nontechnical narrative. Along the way, it collects common threads across chapters and highlights problems, solutions and lessons. Its target audience are those seeking a bottom-line understanding of where sustainable sovereign financing currently stands and where it is heading.

2. Structure and Main Messages

Saying what makes development financing—and public debt—sustainable is no different from saying what makes a car run safely.¹ Is it the engine that generates motion? The brakes, seatbelts and airbags that curb risks? Or the steel frame on which everything is mounted? It is not easy to credit one part over the other; it all has to work and work together.

Sustainable sovereign borrowing is no different. It has many moving parts. If one fails, all fail. To facilitate the exposition, we organize those parts into three functions: debt generation, risk management and operational framework. The key concepts and the profession's best practices for each are presented.

¹ "Sustainable" is used here in its fiscal and financial sense.

We begin with debt generation. We analyze borrowing volume, composition and timing. In the long run, debt is as sustainable as the fiscal accounts it comes from.² Run large and persistent budget deficits, and your creditworthiness is compromised sooner or later. From there to macroeconomic trouble—if not crisis—is a short step. Shocks to the economy as a whole—say, a jump in international interest rates—can turn a weak debt position into an untenable one.

But volume is only part of the story. The composition of debt is equally important. It requires a well-thought-out medium-term strategy that hits the best possible trade-off between cost and risk. At the heart of the trade-off is the fact that short-term, floating-rate or foreign-currency-denominated financing instruments may be cheaper but can also be a red flag of turbulence on the horizon.

With volume and composition decided, the next question is about timing. When during the year should the sovereign tap the market? How is the borrowing calendar affected by the budget cycle, the state of the global economy, central bank operations or upcoming redemptions? And how exactly will investors be engaged and nurtured? All this is more art than science, a matter of judgment and nimbleness.

Once debt has happened, the task of keeping it as riskless as possible begins. Exposures to currency, interest rate and rollover risks can be minimized. Liability management operations, primarily through swaps, do that—at a price. But they require a level of institutional capacity and legal documentation that few developing countries have, opening a role for multilateral assistance.

Of course, debt sustainability risks exist outside the debt portfolio itself. They lie in the kinds of financial obligations that the government may face. Two risks stand out: natural disasters and contingent liabilities. Natural disasters, which seem ever more frequent and correlated with climate change, can be hedged through a new class of instruments: catastrophe (CAT) bonds. The proceeds of a CAT bond are held in escrow and released to the issuer only if a predefined event, such as an earthquake or hurricane, happens. The proceeds do not have to be paid back if released. They are, de facto, an insurance policy.

No such policies exist for contingent liabilities: the explicit or implicit obligations that **might** or **might not** fall on the government to pay. These range widely, from a guarantee given to an investor to pension promises made to workers. One form merits special attention: public-private partnerships (PPPs) in infrastructure. They can provide an answer to the vast, pent-up demand for public capital investment, a demand that climate change is enlarging by the day. But, while there are many good reasons to use PPPs to build ports, railways and electricity grids, the details of their design can make or break their outcomes.

Neither the generation nor the risk management of debt can happen without an operational framework, let alone happen sustainably. Laws, accounting and

² Efficiency and effectiveness in spending borrowed money on infrastructure significantly affect fiscal outcomes. However, the selection and preparation of high-quality projects are beyond the handbook's scope.

institutions are needed. Domestic laws authorize who can borrow on behalf of the government, for what purposes, on what terms and with what protections. But creditors have their own ideas and, over the years, have crafted lending contracts that shield their own interests. The result is an international legal body for sovereign financing that keeps evolving.

Also evolving are the standards to account for and report debt. While international professional associations and multilaterals advocate sound practices, accounting principles vary greatly across countries. Accrual, cash and hybrid systems are equally common. In some cases, the perimeter of public debt stops at the central government, while in others, it wraps around sub-nationals and state-owned enterprises, too. And the valuation and reporting of contingent liabilities go from explicitly booking potential costs to, well, ignoring them. Markets, however, take note. Complete, reliable and transparent debt reports eventually translate into cheaper borrowing.

The last component of the operational framework for sustainable development financing is a human one. It concerns the institutions mandated to contract and manage public debt. DMOs come in many degrees of technical capacity, partly because their staff turnover tends to be high. Most are organized around a front, a middle and a back office, responsible for trading, strategy and settlements and payments, respectively. Their location within the organogram of the civil service matters: when placed inside the ministry of finance, coordination with overall economic policy improves, but independence may suffer. Whatever the office's reporting line, successful public debt management demands constant and constructive interaction with all areas and levels of government, from federal infrastructure ministries to municipal pension funds.

The rest of the synthesis unpacks the messages described above. It is based on the handbook chapters, which deliver more detailed information and deeper explanations.

3. Debt Generation

In this section, we tackle the three decisions at the front end of the development financing process: the amount, composition and timing of borrowing. We identify methodologies and practices used by public debt managers and the implications for sustainability.

3.1. The macroeconomic sustainability of public debt (chapter 1)

Why do governments borrow? How does debt accumulate? And how much debt is too much? These are fundamental questions that can be best answered from the perspective of fiscal policy: how much the government needs to borrow each year, given its policy decisions about revenues and expenditures and its sales or purchases of financial assets—things like withdrawals from deposits, debt buybacks or debt relief collectively known as “other net inflows.”

Assume those other net inflows away, and a government's "gross borrowing requirement" in a given year equals the debt amortizations that come due minus the fiscal balance. Therefore, a fiscal **deficit** implies that new borrowing will exceed amortizations and the debt stock will grow. Debt becomes the result of the accumulation of deficits.³

Since its roots are in the fiscal budget, when is public debt considered sustainable? When the government is able—or perceived to be able—to meet its current **and** future debt obligations. This involves two concepts that are the essence of financial sustainability: liquidity (ability to make short-term payments, no matter how) and solvency (ability to meet long-term obligations out of budgetary resources without additional borrowing, unrealistic austerity or debt restructuring).⁴

Several indicators of liquidity and solvency are commonly used. Most contrast financial obligations, such as interest payments and amortizations, with broad proxies of capacity to pay, such as gross domestic product (GDP) and fiscal revenues. For example, a government or country is seen as liquid when the ratios of debt service to GDP, fiscal revenues or exports are low. And a government or country is seen as solvent when the ratio of total debt to GDP (the debt burden) is below a certain threshold, say, 60%. Some indicators focus on the sheer size of the gross financing requirement, now and in the future; a government needing funding that is multiples of its tax collection is a worrisome sight. And others focus on the exposure of the debt stock to changes in interest and exchange rates or on the frequency with which the stock must be rolled over.

How low or high do liquidity and solvency indicators have to be before we can say that debt is unsustainable or at risk of becoming unsustainable? Multilaterals, credit-rating agencies, banks and others have created their own frameworks to answer that question. The three most widely used for public debt sustainability analysis (DSA) are the IMF's Sovereign Risk and Debt Sustainability Framework (SRDSF), the World Bank's Low-Income Country Debt Sustainability Framework (LIC DSF) and the Debt Dynamics Tool (DDT). They can be deployed to assess the sustainability of public and external debt. Public debt comprises public and publicly guaranteed (PPG) external debt and public domestic debt, while external debt is the sum of external PPG and private debt.

It is educational to peek into the inner chambers of those frameworks, as any public debt manager subjected to the scrutiny of multilaterals can attest. The SRDSF, formerly known as Market Access Countries DSA (or MAC DSA), dates to 2002

3 The calculation is more complicated when public debt is denominated in domestic currency but some borrowing is done in foreign currency. We must use an exchange rate between the two currencies to compute the debt stock. Changes in the rate change the value of the debt stock. When we value the stock of external debt, say, at the end of the year, the convention is to use the end-of-period exchange rate. And when we value the borrowing or amortizations done within the year, we use average exchange rates for that period. When there are differences between end-of-period and average rates in any given year, we speak of "stock-flow adjustments." And when the average rates differ across years, we speak of "valuation" effects. Adjustments and revaluations may represent much indebtedness, especially in countries with volatile macroeconomic frameworks.

4 This is similar to the IMF's official definition of "sustainable": "In general terms, public debt can be regarded as sustainable when the primary balance needed to at least stabilize debt under both the baseline and realistic shock scenarios is economically and politically feasible, such that the level of debt is consistent with an acceptably low rollover risk and with preserving potential growth at a satisfactory level" (International Monetary Fund 2021).

and underwent several revisions. Its latest version, launched in 2022 and still being rolled out, is a mix of econometrics, thresholds and judgment applied over three time horizons. For the near term (one to two years), the debt profile, institutional quality, cyclical indicators and global economic conditions are fed into a model that turns out the chances—the “logit stress probability”—of sovereign financial trouble. The case is considered low risk if those chances are less than one in 15. It is deemed high if they are more than one in five. Anything in between is moderate.

For its medium-term assessment (up to five years), the SRDSF focuses on the country’s public debt and the government’s gross financing needs. Public debt, a proxy for solvency, is projected along a baseline scenario and then “shocked” with changes in the underlying assumptions: budget shortfalls, recessions, changes in interest rates, currency depreciations and the like. This generates a fan chart of debt paths around the baseline, whose characteristics are captured in a debt fan-chart index based on the fan’s width, the fiscal discipline needed to stabilize debt and the institutional capacity necessary to carry the final debt burden. The index is compared with thresholds (below 1.3 or above 2.08) to say whether the risk of stress is low, moderate or high.

The government’s gross financing needs—a proxy for liquidity—are the second leg of the medium-term assessment. They are examined for their volume and the creditor base: Who is buying public debt, how much, what instruments are used and how stable demand is. Short maturities, foreign currencies, floating rates and nonresident investors are all seen as riskier. Sudden changes in macroeconomic conditions (say, a spike in commodity prices) and in the behavior of financiers (say, a burst of capital flight) are used to stress-test the financing needs and generate a financeability index (below 7.6 means low liquidity risk, while anything above 17.9 is high risk). The fan-chart (solvency) and the financeability (liquidity) indexes are then combined into a single medium-term index, which can show low (below 0.257), high (above 0.395) or moderate risk (in between).

The last horizon in the SRDSF is the long-run one (more than five years). The framework recommends an optional qualitative evaluation of the structural factors that are most significant for each country, such as demographics (and the pension and healthcare liabilities that go with it), discovery or depletion of natural resources and the impact of climate change.

What happens with those short-, medium- and long-term risk assessments, both quantitative and qualitative? They are inputs into an overall appraisal of the country’s debt sustainability by IMF staff. The bottom line is a judgment call. Public debt is declared to be either “sustainable with high probability” (more than 80%), “sustainable but not with high probability” or “unsustainable.” For all its mechanical calculations and precise thresholds, the SRDSF still allows for “realism adjustments,” “special cases,” “exit clauses,” “exceptional circumstances” and other ways for common sense to prevail. The conclusion of the analysis is published either in annual Article IV reports or as broad statements in the documentation of financing programs. Markets take note and price their lending accordingly.

What the SRDSF does for advanced and emerging economies, the World Bank's LIC DSF does for developing ones, where data for sophisticated calculations may not be available. Launched in 2005 and carried out jointly with the IMF, the DSA starts by categorizing countries according to their debt-carrying capacity (weak, medium, strong) based on a broad assessment of institutional and macroeconomic fundamentals. Each category has its thresholds for debt indicators: The less capacity, the lower the threshold. Baseline and stress scenarios are built, but over a much longer horizon (20 years) than the SRDSF's. Because of that extended view, debt indicators are calculated in present values, discounted by an interest rate. The indicators are total PPG to GDP, external PPG to GDP, external PPG to exports, external PPG service to exports and external PPG service to fiscal revenues.

The output of the LIC DSF is a measure of debt distress risk: low (no indicator breaches its threshold under any scenario), moderate (thresholds are breached in stress scenarios), high (breaches happen even in the baseline) or in debt distress (breaches already happened). The measure has a direct financial implication, for almost all multilaterals use it to decide how much and what type of funding to allocate to which country (grants, loans, blends and so on). The measure also impacts market perceptions as the results are made public.

Finally, the DDT is an increasingly popular and simple way of projecting, over a 12-year horizon, a single variable: the ratio of public debt to GDP. Informally developed by IMF economists, the method is based on historical, current and projected data for nine macroeconomic variables, ranging from debt stocks, fiscal balances and economic growth to exchange, interest and inflation rates. The baseline projections are then subjected to changes in the path of the variables, say, by a sudden depreciation of the local currency. The results begin to form a fan chart of possible outcomes for the debt path. The DDT can be engineered backward to help identify the policy decisions that can bring the evolution of the debt burden onto a declining trend.

Despite their technical beauty, the three frameworks—and the many others used in the finance industry—cannot, by themselves, assure debt sustainability. They are only tools for debt managers to choose a borrowing policy over another. The choice is made and reflected in the medium-term debt strategy.

3.2. The medium-term debt management strategy (chapter 2)

Macroeconomic frameworks give governments a sense of **how much** they can or should borrow (**volume**) rather than **how** they should borrow (**composition**). What combination of currencies, interest rates and maturities produces an appropriate trade-off between cost and risk at each point in time? This is the central question of debt management strategies. The answer is critical for the sustainability of public finance and the stability and development of the broader financial market. Get the strategy wrong, and chances are that a shock may become a crisis, as Mexico (1994), Thailand (1997), the Russian Federation (1998) and Argentina (2001) have shown.

A typical medium-term debt management strategy extends over three to five years. It is updated regularly as country and global circumstances change. And it is expressed as a set of ceilings and floors. For example, the maximum share of foreign-currency debt in the portfolio may be set at 20% to limit currency risk, the floor for medium- and long-term debt at fixed rates may be placed at 60% to cap interest risk, and the maximum share of debt maturing within a year may be 25% to curb refinancing risk. A target may be set for the stock of government securities held by investors in the domestic market to develop local funding sources. Low-income countries may seek to maximize concessional financing from donors and multilaterals before tapping markets and commercial lenders.

Debt strategies are not good or bad. Given the borrower's priorities, preferences and possibilities, such strategies are optimal or suboptimal. Today, most governments produce public debt management strategies. These have become a sign of institutional maturity, which financiers value as a critical input in their know-your-client due diligence.

What risks should a debt management strategy keep in mind? There are three main ones. First, refinancing risk or the likelihood that a debt will have to be rolled over at a high or prohibitive cost. This can turn an illiquid government into an insolvent one. To detect refinancing risk, you can look at the concentration of repayments over the next 12 months. You can also look at the shape of the redemption curve, which shows how much is due in each of the coming years. Or you can compute the average time to maturity (ATM), a weighted average of the number of years remaining until all debts are canceled, where the weights are how much has to be canceled each year as a proportion of the initial stock of debt. The ATM tells us how fast public debt matures: An ATM of three years is comfortable; one of six months is worrisome. Note that the three ways to measure refinancing risk should be used together as, respectively, one detects imminent problems, one highlights problems in a given year and one shows the overall trend in the portfolio.

The second type of risk that is integral to a debt management strategy has to do with the interest rate. If market rates rise at the moment when a floating-rate debt is to be reset or a fixed-rate debt is to be refinanced, the cost of servicing will also rise, sometimes substantially. To estimate this risk, debt managers calculate the proportion of debt whose interest rate will change within, for example, a year. They also compute the average time to refixing (ATR), which is the weighted average of years for the entire portfolio to change its interest rate. The weights are given by how much debt needs refixing each year as a proportion of the initial stock of debt. An ATR of 18 years is much better than one of 18 months.

Last, and perhaps most relevant for developing countries, is foreign currency risk: the possibility that debt service becomes more expensive in the local currency because of a depreciation of the exchange rate. The most usual way of looking at this risk is through the share of foreign currency-denominated debt in the total debt stock, which does not indicate time. For that, analysts consider the share of short-term foreign currency debt. A deeper evaluation would explore the currency composition of the debt portfolio—crucial when multiple currencies are involved—compared with the country's main sources of external revenue.

All the risks mentioned here can be mitigated before and after the debt is contracted. The debt management strategy is a plan to minimize risk **before** borrowing occurs. The strategy can be executed by, among others, taking out loans of staggered maturities, issuing amortizing loans (rather than “bullets”), diversifying the investor base or maintaining liquidity cushions. **After** the debt portfolio is formed, the tools for liability management kick in, involving instruments such as debt buybacks and debt swaps, interest and currency swaps and contingent lines of credit (explained later).

How do measures of risk relate to cost in the debt management strategy? In general, riskier borrowing tends to be cheaper. For instance, local currency, short-term T-bills carry lower interest payments than long-term securities but more considerable refinancing risk. Similarly, domestic bonds tend to have a higher interest charge than foreign-currency ones but are not exposed to currency depreciations. And floating-rate debt may be less expensive than fixed-rate debt if interest rates do not increase too much.

To find the sweet spot in the cost-risk trade-offs, many a DMO uses models. The modeling starts with building a baseline scenario. Basic assumptions are made about key variables such as interest and exchange rates, the primary fiscal balance and economic growth. A strategy is laid out detailing the amount and type of borrowing. The resulting cost is estimated and expressed as interest payments in proportion to GDP, budget revenues or total resulting debt over GDP. The baseline scenario is then shocked with changes in the basic assumptions—spikes in interest rates, currency collapses, budgetary deviations, slumps in growth and so on—and the cost of the strategy is re-estimated. The difference in cost between the baseline and the shock scenarios is the cost at risk in the strategy. The exercise is repeated for alternative strategies until one best meets the government’s preferences and constraints. While the process sounds simple enough, it tends to be tripped up by a technical input: How to quantify the probability of each type of shock, so we know which ones to worry about. The process calls for a level of statistical capacity that not every government has.

Modeling cannot—and, in practice, does not—replace sound judgment in debt management. While quantitative models focus the mind on the variables that matter most in a strategy, policymakers still need to consider the broader context in which their decisions happen. Paramount is the interaction between fiscal, monetary and debt policies. They feed on each other but cannot act for each other. Even the most ingenious borrowing strategy is no substitute for fiscal discipline.

3.3. The annual borrowing plan (chapter 3)

If debt sustainability analysis is about the **quantity** of debt, and the debt management strategy is about its **composition**, then the ABP is about its **timing**. But the plan is more than a calendar of bond sales – important as a calendar is to give investors predictability. The plan is a sequence of many steps, each critical for the success of the others.

Start with calculating the government's gross financing needs for the year. Generally, that sum equals the sum of the primary fiscal **cash** deficit, interest payments, amortizations and any borrowing necessary to carry out liability management operations. The last item is special, for it has to do with debt buybacks or debt swaps meant to change the composition of the stock of debt (more on this later).

The choice of funding sources is the second step. Some countries—usually poorer ones—will first maximize their borrowing from concessional lenders such as multilateral banks and bilateral donors. Others—usually richer ones—may tap their cash deposits. Once the sources are factored in, the remainder is called the “financing gap.” To fill it, debt managers borrow in the market.

Which market? The preferred choice is the domestic capital market, where debt can be denominated in local currency, and currency risk can thus be avoided. But the domestic market may not be large enough or offer long enough maturities. That is when borrowing abroad in foreign currency becomes unavoidable, and trade-offs between cost and risk come in. The final decision is guided—it must abide—by the objectives and the parameters set out in the debt management strategy. That is why a sound strategy is necessary—albeit insufficient—for a sound ABP.

With amounts and currencies decided, the selection of instruments is next. Two things are considered: How urgently the cash is needed and what the investor base will bear. For example, zero-coupon bonds generate less cash upfront but do not require interest payments during the year. Similarly, “bullet” bonds do not require any principal repayment until maturity, as compared with the amortizing kind, but carry more refinancing risk. And, while budget-support loans from multilaterals disburse fast, they may carry policy conditions. In contrast, bond issuances in the international market are equally fast to disburse and have no policy strings but are more expensive and shorter term.⁵

This brings us to the investor base and how to reach it. The average country's base comprises commercial banks, pension funds, insurance companies, asset managers, individual savers and other investors. Most are resident, some are not. Each has its own preferences and reasons to buy government debt; banks use short-term T-bills to meet regulatory reserve requirements, while pension funds prefer long-term securities. Individual savers purchase small amounts of bonds but tend to hold on to them. Foreign financiers may be quick to buy new issuances and quick to sell them if they become too risky. The message is clear: It is as imperative for public debt managers to know their investor base as it is to diversify and broaden it.

Once quantities, markets, instruments and target buyers are selected, the next step in the ABP is to decide how to put the new debt in the hands of investors. The most common way of issuing bonds is through auctions. But there are other ways, too, such as syndication, tap sales and private placements. At the retail level, many governments offer securities through post offices, bank branches and internet platforms.

⁵ Loans for infrastructure may be part of the ABP. However, their timing and size decisions are usually linked to the underlying projects.

Those are direct ways to place debt with investors. There is also a powerful **indirect** way: the system of primary dealers. They are licensed intermediaries who commit to underwriting issuances in the primary market, performing the role of market-makers in the secondary market and reporting on market conditions to the DMOs; all ensure stable demand and liquidity. In exchange, primary dealers have exclusive or privileged access to the DMOs' primary market transactions, the exclusive right to submit noncompetitive bids, access to lines of credit or the ability to borrow bonds from the depository. The idea of primary dealers was first piloted by the United States (US) in the early 1960s and has since been widely adopted among countries with well-developed financial industries.

The last step is for the debt manager to articulate the borrowing calendar and, within it, the auction calendar. An effective way to organize it is around redemptions, ensuring that cash is available when repayments are due. But there are other considerations: minimizing bunching, avoiding periods of financial turbulence at home or abroad, coordinating with the central bank's own open-market operations and timing the cycle of tax collection, to name a few. Many countries publish their calendars, making the market predictable and tightening the accountability of civil servants.

By now, it should be evident that, with so many decisions involved, building an ABP is more an art than a science. Questions such as how much to borrow at each point within the year, from whom and with what instruments can be answered only within the context of each government and country and the state of the global economy. That context changes all the time. Putting down a borrowing calendar over 12 months, with drafts for two or three years out, and publishing it, takes a good deal of institutional capacity—and bravery.

4. Risk Management

We now turn to what happens after borrowing takes place. Can the accumulated debt be made more sustainable by hedging it against financial, fiscal and contingent risks? How different is the hedging when the financing is used for infrastructure? The answers are yes and quite different. But several elements have to be in place to make both possible.

4.1. Instruments for liability management: Old and new (chapter 4)

Much as it is visible and complex, borrowing is only a part of public debt management. When a government signs loans, issues bonds and buys derivatives, it builds up a debt portfolio that may contain hundreds—if not thousands—of outstanding claims. The portfolio needs constant and proactive optimization. As country and market circumstances change, the best blend of interest rates, currencies, maturities, balances and exposures may change, too. The practice of continuous portfolio adjustment is called “liability management.” It began in the mid-1970s with the

onset of the standardized derivatives market but gained momentum—and proved its value—with each financial crisis thereafter. Today, liability management is a core function of any treasury.

What are the traditional instruments of liability management? And what new ones are on offer? Perhaps the oldest tools for optimizing a debt portfolio are buybacks and swaps. Buybacks are the exchange of existing bonds for cash, where the cash may come from reserves or a separate issuance of new bonds. Swaps are similar, but the exchange is not for cash but new bonds. In both cases, the transaction is done at market prices voluntarily and transparently. This makes buybacks and swaps fundamentally different from debt restructuring, an involuntary process triggered by a debtor's inability or unwillingness to pay back what it owes. While buying or swapping one's bonds is a sign of financial strength, restructuring is a sign of potential default.

The other forms of swaps public debt managers enter concern interest rates and currencies. Interest swaps are contracts whereby a debtor facing a stream of interest payments at a floating interest rate exchanges them for another at a fixed rate. Currency swaps are similar, but what is exchanged is a stream of debt service payments denominated in one currency for another denominated in a different currency. The debtor is protected from rises in interest rates or appreciations of the currency in which the debt is denominated. Both types of swap contracts are privately arranged, mainly through investment banks, in what are known as over-the-counter transactions. While the over-the-counter market is vast, governments in emerging and developing countries have only recently begun to tap it. Two barriers stand in their way: lack of institutional capacity (valuating and executing the operations calls for specialized skills and information technology [IT]) and hurdles to subscribing to internationally accepted documentation (the International Swap and Derivatives Association [ISDA] Master Agreement (details below)).

More rudimentarily – but effectively – governments manage their liabilities with contingent credit lines, mostly from multilaterals such as the IMF and the World Bank. Instead of disbursing upon signature, those lines are simply loans that disburse if a pre-agreed event occurs, say, a fiscal crisis or a natural disaster. This ensures continuing funding and buttresses investors' confidence, both of which help preserve the quality of the debt portfolio. Indonesia is a case in point: It sailed through the 2008 global financial crisis almost unscathed because it had prearranged a contingent financing facility with the Asian Development Bank, Australia, Japan and the World Bank.

While interest and currency swaps and contingent credit lines are the workhorses of liability management, new and innovative instruments are being tested daily. Take debt-for-nature swaps. While few and small, they provide debt relief in exchange for commitments to safeguard the environment by designating land as a protected area, for example. These swaps tend to involve a grant component and, financially, can focus on debt purchases (e.g., Conservation International buying and canceling Bolivian debt), forgiveness (e.g., Paris Club creditors writing off half of Poland's debt

so it could create its Eco Fund) or guarantees for new issuances (e.g., Seychelles' blue bonds).

Another new and fast-growing instrument is the suite of thematic bonds. These are securities issued with a promise to use the proceeds in the pursuit of environmental, social or governance (ESG) objectives or of the United Nations' (UN) Sustainable Development Goals. Generally, the promise is made in a framework document rather than the bond's prospectus and is not legally binding. But in some cases, the repayment may be formally linked to specific results. Attain the results, and you pay back less. Either way, the growth of the thematic bond market has been exponential, topping USD1 trillion in issuances in 2021 despite the pandemic. Green bonds dominate the issuances by far. Public and private issuers have been active. And an industry of second-party opinion providers has emerged to vouch for the consistency of the issuers' plans, mainly vis-à-vis the International Capital Markets Association's guidelines.

For all the popularity of thematic bonds (whether green, social, gender, blue and so on), their market pricing still depends on creditworthiness. To the average issuer, they are not cheaper. However, sporadic evidence of a price difference or "greenium" between conventional and green bonds issued by some governments in a single year has been found. And, when a sovereign issues them, thematic bonds require a great deal of institutional coordination across sector ministries. Why would a public debt manager then want to use them? Two main reasons. First, diversification of funding sources, a code word for more and better financing options. The demand for ESG assets has skyrocketed. Currently, almost 5,000 of the largest investment houses in the world, with some USD120 trillion dollars in assets under management, are signatories to the UN-sponsored Principles for Responsible Investment. Those investment houses eagerly seek opportunities to show their ESG credentials to their owners. Second, strategic signaling. Once a government or a corporation issues, say, gender bonds, it would damage its reputation if it were to act against women's empowerment. All related projects gain budget stability and extra attention to their implementation.

Last, in Islamic countries, public debt managers have resorted to sukuk bonds, debt securities that respect the three main principles of Islamic finance: equity, participation and ownership. Together, the principles underlie the idea that the bond should be structured to give all parties equal access to information, that the distribution of risk should be fair, and that behind the financial instrument should be a real asset or project. Capital should be rewarded not by the mere passing of time (no interest payments) but by the risk it takes. Sukuks are popular among Muslim investors, and some USD170 billion were issued in 2020. The future growth of sukuks, however, may be limited by two factors: They are illiquid outside specific jurisdictions, and ensuring compliance through sharia scholars may take time and lessen predictability.

4.2. Instruments for fiscal risk management: Old and new (chapter 5)

Public debt is as sustainable as the fiscal accounts it comes from. The more volatile a government's tax revenues or expenditures are, the more expensive it will be for a government to borrow, if it can borrow at all. Unexpected changes in interest rates, exchange rates, commodity prices or even natural disasters can throw budgets off course and ruin credit ratings. This can be particularly painful for middle- and low-income countries, as they are forced to put on hold much-needed investment. The setback in development and poverty reduction can be large and lasting.

One would expect those countries to manage their fiscal risks proactively, yet few do, for several reasons, even though the necessary tools exist. On the demand side, national laws rarely authorize—let alone mandate—the purchase of what are, in effect, insurance policies. Nor do national laws recognize the standard documentation used in international finance, notably ISDA Master Agreements. Lack of institutional capacity plays a role; not all public DMOs have the right staff for that kind of transaction. And politicians worry about reputational blowback if they buy coverage against an event that does not happen. Things are not better on the supply side. International banks are not rushing to offer fiscal insurance products to clients who lack adequate laws or knowledge, lest disputes hamper other lines of business.

Those obstacles are challenging but not impossible to overcome. Many governments have been buying fiscal insurance, with excellent results. What kind of financial instruments do they use? And what technical elements had to be in place first? The short answer: derivatives, reference rates and ISDA Master Agreements.

The most common derivatives in fiscal insurance are swaps. A swap is a contract in which two parties exchange the cash flows derived from each party's assets. The cash flows may come from interest payments on a fixed-rate loan and on a floating-rate loan, in which case the transaction is called an "interest rate swap." The same principle can be used for other assets, such as commodities, and liabilities, such as disaster insurance payouts. The possibilities are virtually limitless because swaps are customized and arranged privately over the counter; they are not listed and traded in public exchanges. The idea was first piloted between IBM and the World Bank in 1981. Four decades later, the aggregate value of outstanding swaps has topped USD600 trillion.

While swaps are the most popular, options and futures are other derivatives that hedge fiscal risk, giving a government the right (option) or the obligation (future) to buy or sell a commodity at a predetermined price. The actual commodity is not delivered. Rather, at a point in time, a cash settlement occurs for the difference between the actual and the agreed price. Options and futures are standardized and traded in public exchanges, reducing the risk that one side of the deal may default on its promises: the counterparty risk.

The CAT bond is a more recent derivative used for fiscal insurance. It transfers the risk of events like earthquakes, hurricanes or tsunamis to the market. How does it

work? Investors buy a bond on which the government pays interest. The bond's proceeds, however, are held in an escrow account or special purpose vehicle. If a predefined type of natural disaster occurs within the life of the bond, the proceeds are released to the government with no obligation to repay them. If the disaster does not happen, the investors get their money back.

Governments have put all these fiscal risk management techniques to the test. When projections showed interest rates rising, Panama used swaps to convert its World Bank loans from floating to fixed rates. Morocco issued bonds in US dollars because it was cheaper but, through a currency swap, effectively converted the bonds into euros, the currency of most of its external trade. Tunisia and Uruguay hedged their exposures to jumps in the price of oil, a commodity they import and locally subsidize. Mexico did the opposite: It hedged its exposure to falls in the price of oil, a commodity it exports. And Colombia, Mexico, Peru and the Philippines issued CAT bonds (or equivalent insurance) to ward off the cost of earthquakes, hurricanes, tsunamis and cyclones. The benefits for fiscal and debt sustainability—and, to some extent, for credit ratings—have been substantial.

The applications of derivatives to public finance were possible because two ingredients were in place: a reference rate and an ISDA Master Agreement. The reference rate, which used to be straightforward, is now in transition. A manipulation scandal forced British regulators to abandon the London interbank offered rate (LIBOR), the interest rate benchmark that global financial markets had used since the mid-1980s and underpinned over USD400 trillion in outstanding contracts. The abandonment of LIBOR meant that each major financial jurisdiction began to calculate and publish its own alternative risk-free rate starting in 2022, with colorful acronyms such as SOFR in the US, SONIA in the United Kingdom (UK), ESTR in Europe and TONA in Japan.

With time, reference rates will not be an issue for governments to enter derivatives, but the lack of ISDA Master Agreements will. It is the standard document used in over-the-counter transactions. Its template format, with a customizable schedule and a credit support annex, gives confidence to financiers that the contractual arrangements are solid and makes the derivative itself easier to trade (more liquid). However, few governments in emerging and developing countries have approved and filed an ISDA Master Agreement, primarily because of the upfront investment in internal approvals and legal opinions.

The combination of derivative instruments with which public officials are unfamiliar, reference rates that are in transition and the ISDA Master Agreement that lacks identity under domestic law has become an obstacle to fiscal risk management. The situation opens a major role for development banks. Because of their own derivative transactions, they have the skills, the standardized documentation and the market connections (the “Rolodex”) to intermediate fiscal hedges between governments and investors. And they have the right incentives, too: They are developmental rather than profit-driven, are owned by their clients and have the mandate to build local institutional capacity.

4.3. Contingent liabilities: The danger of fiscal icebergs (chapter 6)

A sovereign's creditworthiness—and its debt sustainability—depends on the financial obligations it **has** and those it **might** have if certain events take place. The latter, called “contingent liabilities,” can be explicitly written in a contract, such as a loan guarantee or a guarantee of minimum revenue for a private infrastructure provider. Contingent liabilities can also be unwritten but expected—and priced—by the market. Would any government let a state-owned power company go bust if it meant widespread blackouts? Let a private bank fail and take down the entire financial system? Or let a province go without teachers, nurses or police? The potential cost of bailouts is considered implicit, contingent public debt.

Whether explicit or implicit, when realized, contingent liabilities are often correlated with each other and can be highly expensive, averaging a tenth of GDP for a banking crisis, 3% to rescue state-owned enterprises and 2% or PPPs gone bad. Natural disasters and the effects of climate change can be even costlier. The averages, however, hide significant variance. Some countries have seen their actual public debt increase by half over realized contingencies. The possibility puts a premium on *ex ante* identification, quantification, monitoring, mitigation, recording and disclosure. Better to know what could happen, mitigate risk and prepare to respond than wait until it is too late.

Fiscal risk registers are a useful way to identify contingent liabilities. In their simplest form, the registers are matrixes that compare the probability of an event (say, less than 10%, 10 to 50%, more than 50%) with its potential fiscal cost (say, less than 1% of GDP, between one and 5%, or greater than 5%). The register helps focus the minds of politicians and policymakers on highly likely, high-impact events and, one hopes, triggers preventive action.

But calculating those probabilities and costs is hardly trivial. Models abound. For PPPs, the P-Fiscal Risk Assessment Model projects private cash flows and public liabilities over time, then shocks them to generate a spectrum of fiscal obligations (how much the government could be forced to pay). For guarantees, their value can be estimated by comparing the cost of financing with and without them, assuming market data exist for both. And for state-owned enterprises, liquidity, solvency, profitability, financial performance and fiscal dependency calculations mimic those that the financial industry applies to private corporations. All those and other methods, many of which are part of the IMF's Fiscal Risk Toolkit, call for plenty of data and expertise, neither of which is always available. Still, countries from Australia, France and Sweden to Colombia, Indonesia and the Philippines are making progress in detecting and quantifying their fiscal icebergs.

Once you know what is likely to happen and how costly it would be if it did, mitigation efforts can proceed. They can be about avoiding risk altogether; a law, for example, or even the constitution may prevent the federal government from financially helping states. Mitigation can be about transferring risk to or sharing it with others, as insurance policies and partial guarantees do. Or mitigation can be

about capping or reducing government exposure, which is what limits on deposit insurance and bank supervision do. And, in case everything else falls short, mitigation can be about building buffers, such as rainy-day funds and credit lines.

More than anything, contingent liabilities must be constantly monitored and openly reported. But are they? Is there enough awareness of them when lenders price financing? International experience is inconclusive. While many advanced and some emerging countries have set up dedicated units to track, disclose and budget for fiscal risks arising from state-owned enterprises, the financial sector, legal claims, PPPs or climate-related events, much is yet to be done in the developing world. Price differentials in bond markets back that observation.

But, even when contingent liabilities are transparently managed, accepting them can convey the wrong incentives. Contingent liabilities can be used to escape budget discipline (e.g., when a guarantee is given to a private party for a project that should otherwise be fiscally funded). They can foster moral hazard (e.g., a provincial government borrowing more than it should, knowing it will be federally bailed out). And they can help procrastinate on reforms (e.g., the restructuring of a public utility). Therefore, having a clear framework to approve—or preemptively decline—contingent obligations is so necessary.

4.4. The special case of infrastructure financing (chapter 7)

Most governments emerged from the pandemic with bloated fiscal deficits and mounting debt. They face years of retrenchment and austerity, leaving little room to pay for infrastructure projects right when climate change has made them all the more urgent. If the situation is bad in advanced economies, it is much worse in developing countries with less wealth and lower creditworthiness.

With the public purse all but empty, where can financing for infrastructure come from? The easy answer is the private sector. But mobilizing private finance sustainably and in large volumes requires careful handling. For every new project or its subsequent operation and maintenance, the first question is how it will be **funded**. Who will bear the cost? The possibilities range widely, from the users paying for use (say, tolls to cross a bridge) to the taxpayers footing the bill (the government writes a check and lets people cross the bridge for free). Other funders can be targeted and combined (through tax revaluation of nearby properties that benefit from the bridge, for example).

Once we know how a project will be funded, the second question is how it will be **financed**. Who will advance the cash to construct it and how? Options range widely, from the government and multilaterals to donors and markets or associations among them. And their financing can take many forms: bonds, loans, equity, grants, guarantees and others.

For private investors to participate in public infrastructure, the government's decision to fund or finance is critical. They need to know, for example, whether pricing for the service will be enough to recover its cost or whether a development

bank is willing to join the project and provide long-term loans. But investors look beyond the project itself: The stability of the economy, the quality of regulation and the level of bureaucracy and corruption all play a part. Sometimes, a single policy reform (or lack of it) is enough to unlock (or block) private financing.

Knowing that investors take a broad view before committing to an infrastructure project, the government should do the same before committing support—financial or otherwise—to private participation. The project’s objective must be clear: solving a market failure, internalizing an externality, giving access to the poor, increasing provision, improving quality, boosting transparency, lowering costs and many others.

Only after the objective has been set can the support instrument be chosen. The menu is ample: from grants, in-kind contributions (say, with land), tax incentives and output-based payments to guarantees for risks the government can control (regulations, tariffs) and those it cannot (foreign exchange rates, user demand). Each serves a different purpose. Take risk mitigation. Financiers care about the risk in lending (known as “credit” risk), in equity (“investment”), in the project itself (“commercial”) and in the project’s policy framework (“political”). Depending on the risk holding back private participation, a government may tailor and offer partial or full guarantees. And when the government’s credibility is not enough, it may mobilize multilaterals such as the World Bank to provide the guarantees on its behalf.

Multilaterals are an effective way to bump projects above the line of profitability and make them attractive to private investment. Multilaterals can mobilize grants from donors, lend with long maturities at below-market rates and share their technical capacity for design, implementation and regulation. Multilaterals can even provide coordination across countries to make regional projects possible. Sometimes the halo effect is more valuable for investors than a monetary contribution. In principle, national development banks can cast the same halo as a multilateral. In practice, only those with clear mandates, are managed independently, operate transparently and allocate subsidies in a catalytic way do.

One form of private participation in the financing and operation of infrastructure has been the subject of much attention: PPPs. These long-term contracts, which date back to the Roman Empire, see a private party provide a public asset or service and bear the related risks in exchange for government remuneration based on performance. The contract may call for the private party to design, build, finance, operate, maintain, rehabilitate and transfer infrastructure—or it may just call for some of those activities. Contrary to popular belief, they do not necessarily save fiscal resources, bring lots of fresh capital, deliver better services or reduce corruption. Only well-structured PPPs do that.

What does a well-structured PPP look like? First, it has a conducive governing law that is self-standing or as part of public procurement legislation. Second, it has been promoted, arranged, managed and monitored by a dedicated PPP unit in the civil service. Third, it has been costed, reported and budgeted, explicitly valuing any contingent liability. Fourth, its target project has been professionally evaluated. Fifth, the source of funds for the remuneration of the private investor is known and

stable, whether users, the government or both. Sixth, the PPP envisages ways to renegotiate or cancel its contract; after all, about one in 20 PPPs gets canceled. And seventh, the performance of the private party and the project's performance can be measured through clear indicators that, to the extent possible, are made public. Globally, only about a tenth of PPPs disclose that information.

Those are not trivial requirements, especially for a low-income country. But they are worth meeting. PPPs have the potential to harness the profit-driven efficiency, creativity and risk-taking of the private sector and deliver the quantity and quality of needed infrastructure services. The question is one of careful alignment of incentives. And yet, a 2018 World Bank study found that preparation and contract management are the areas of PPPs that could be improved in rich and poor countries. Making the most of private investment in infrastructure remains a work in progress.

5. The Operational Framework for Sustainable Development Financing

Debt generation and risk management would be impossible—let alone sustainable—without proper laws, accounts and institutions. But what is “proper”? And how can proper be achieved?

5.1. What the lawyers say: Legal pillars of public debt (chapter 8)

The legal frameworks that rule public debt result from a recent and drastic evolution. Until the early 1980s, responsibility for borrowing was spread across government agencies in most countries, overall policy goals were rare and financial strategies almost nonexistent. Data were scattered, and there was little or no cost-risk analysis. That such a loose arrangement did not lead to more sovereign defaults among developing economies is probably because of a lack of access to international capital markets. Most of their foreign creditors were multilateral institutions and bilateral donors that eventually gave up their claims.

Things have since changed. The idea that public debt management ought to be efficient, effective and transparent—a view likely taken from private corporations—is commonly accepted. Through laws, congresses or parliaments set policy goals and grant authorization: what to borrow for and who can borrow on behalf of the government. The cabinet then sets a strategy (how to borrow). Here is where the mix of cost and risk is decided, and the minister of finance lays out an ABP (when to borrow). Ultimately, independent auditors do *ex post* evaluations that revert to the political level. At each step, a dedicated management unit does the technical work, from producing documents to issuing bonds in the market.

But modern public debt laws do more than authorize borrowing. They put conditions on it. Sometimes, the conditions relate to consistency with fiscal budgets (e.g.,

Kenya) and sometimes with the loans' financial terms (e.g., Ghana). In practice, those conditions can be a major source of risk to creditors, who are left to judge whether their financing meets the intentions of the legislators. To solve the problem, albeit only partially, some legal frameworks appoint a high-ranking authority (likely the attorney general) to provide opinions on the validity of loan contracts and make the opinions final.

Even when authorizations to borrow are clear and funding is consistent with a legislature's wishes, many other aspects of public debt law carry risk for creditors and, in some cases, make loans impossible or "unbankable." Four factors are noteworthy. First, reporting requirements: How ample or narrow is the law's definition of debt to be publicly reported by the government? The definition can lead to underestimation or overestimation of repayment capacity. For instance, are guarantees, lease agreements and suppliers' credit included?

Second, the definition of "government" vis-à-vis "the public sector": Local governments and state-owned enterprises are legal persons that can enter contracts, borrow, sue and be sued. They raise contingent liabilities for the central government, which, when adequately disclosed, may weaken its creditworthiness.

Third, the overall legal body for public finance may or may not allow the collateralization of public assets. When it does, placing a lien on an asset to secure a loan may trigger default in other loans because of the "negative pledge" covenant usually included in credit agreements with multilateral institutions such as the World Bank. Multilaterals seek seniority over other external creditors—and over the foreign currency needed to repay external obligations—by having the government promise not to collateralize public assets (thus, "negative pledge").

Fourth, does the law allow a government to renege on its debts? Can it walk away from obligations taken on by a previous administration? This is a make-or-break legal risk for a creditor. Attempts to nullify debt have happened. They were based on "creditor complicity" (a lender bribes a public debt manager), violation of UN sanctions and "state necessity" (something makes the government unable to pay). None of the attempts got too far; Argentina and Mozambique are exhibits of that.

How can creditors protect themselves against the uncertainties or gaps in the national legal framework for public debt? Over the years, lawyers have built clauses into loan agreements that mitigate the risk of lending to sovereigns. The clauses span from "representations and warranties" (making borrowers declare information, which, if proven untrue, triggers automatic default) to "collective action clauses" (allowing a majority of bondholders to accept, on behalf of all of them, the terms of a debt restructuring). Some clauses have been conspicuous: *Pari passu* clauses, promising to treat all creditors equally in case of default, were at the center of the legal battles over Argentina's default of 2001. Some, such as the choice of jurisdiction, are driven by the comfort of tradition; most international financing is governed by the laws of the State of New York and England and Wales. Some, called "undertakings" or "covenants," make governments promise to do or not do certain things. And some focus on what exactly makes a loan delinquent: the "events of

default.” Debt can become defaulted and, thus, immediately repayable even if it is being serviced on time. Cross-default clauses are a good example: Failing to make good on one debt automatically triggers default on the borrower’s other debts.

To this day, some of the world’s brightest—and highest-paid—minds continue to craft and fine-tune clauses to protect the creditor. Their work can unlock much-needed financing for emerging and developing countries. But the reality remains that, from a legal perspective, lending to sovereigns is risky business, which is why experienced bankers see contractual protections as complements, not substitutes, for old-fashioned due diligence. Early efforts to know your client—its projects, finances, laws, politics and practices—always pay off.

5.2. Debt accounting, reporting and disclosure (chapter 9)

At the core of lending—for development or any other purpose—is the belief that the prospective lender knows how much debt the borrower already has. Incomplete, inaccurate or unreliable data can distort the price of a loan and even block access to it, particularly if the debtor is a government, as there is no international bankruptcy court for sovereigns. Regarding public debt, officials who decide to borrow and commit generations of their fellow citizens to repay the debt have a civic obligation to be transparent.

Sound accounting, reporting and debt disclosure are the pillars of sustainable financing. But what does “sound” mean? The answer is not straightforward for accounting systems, which vary across countries. Some governments use the cash basis (record transactions only when money changes hands), some use the accrual basis (record transactions when debts are due) and some combine aspects of both. Even the subject of the accounts varies: In some countries, it is only the central or federal governments, while in others, it is the consolidated public sector, which may include the books of provinces, state-owned enterprises and others.

To its credit, the International Public Sector Accounting Standards Board (IPSASB)—a global professional association—has developed and maintains standards for specific financial instruments. The standards provide a useful benchmark to assess the soundness of accounting systems and, by implication, of debt accounting across governments. But the IMF, in its role as a collector of international macroeconomic data, has set out accounting principles specific to public debt. The IMF has defined concepts such as residency of the creditor (what matters is territory), time of recording (when economic value changes), valuation methods (nominal, face, book, fair, market) and unit of account (domestic currency). At various speeds, countries have been adopting IPSASB and IMF recommendations. As governments transition from cash to accrual basis, they have been able to calculate their balance sheets and net worth, which is a sign of quality in public bookkeeping. By now, some 38 governments can do so.

The purpose of good accounting is good reporting. Recording transactions and monitoring accounts precisely are only worthwhile if the information is shared with

those who need it. Public debt offices are compelled to share their information by laws, contracts, investors, rating agencies, multilateral, other government branches and, ultimately, their citizenry. Each recipient calls for a specific type of report. For instance, in a normal year, a DMO would send tailored reports to the supreme audit institution, share analytical background work with the legislature, publish the debt management strategy and ABP, disseminate bulletins with the results of bond auctions, send performance evaluations to the cabinet, report data to the IMF and the World Bank, answer questions from credit-rating agencies and make presentations to prospective investors. Some recipients act as secondary sources of dissemination, for they compile data from many countries and publish their results.

What should be reported? Everything the law permits. At a minimum, the IMF and the World Bank recommend publishing debt management strategies, ABPs and data on the debt portfolio. The data should include the volume and composition of the debt stock, its maturity profile and cost measures such as implied interest rate. They also recommend disclosing risk indicators, including average time to refixing and maturity. Higher frequency and granularity of the disclosed information indicate higher transparency. But the IMF and the World Bank are not alone in issuing principles for debt reporting. The G20, the Institute of International Finance and the OECD have in recent years put forward their own ideas, while some countries have shown in their day-to-day debt management what best practice looks like: France comes to mind. Perhaps because of mounting debt burdens and the approaching need for relief, debt reporting has become a global strategic issue.

Contingent liabilities—obligations for which the government is responsible only if a certain event occurs—are a special case for accounting and reporting. They could be due to formal and explicit guarantees (say, those given to the constructor of public infrastructure) or informal and implicit (say, the expectation that the government will not allow a major state-owned enterprise to default on its debt). Either way, the question is how to account for them and whether and how to disclose them. The IMF advises bringing them into the books only when the probability of the contingent event happening is 50% or more, and the resulting cost can be reasonably estimated.

Not all countries use the same methodology to estimate the value of contingent liabilities. Some, such as Norway and the US, charge the budget once for the net present value of the expected loss. Some, such as Colombia and Sweden, charge only the expected cash loss in a given year. And some do not report contingent liabilities at all, something credit-rating agencies do not take lightly. Behind the variation in practices are the technical complexity of estimating probabilities and the political will to face transparency. Overall, 60% of OECD countries disclose contingent liabilities, either in special reports or as notes to the fiscal budget. In emerging and developing economies, that percentage is much smaller.

Whether for actual or for contingent liabilities, the cycle of accountability does not end with producing and reporting accounts. Closure is brought about by audits. They can take several forms depending on who does them (external or internal auditors) and what is covered (compliance with laws and regulations, financial accuracy or cost performance). And, as in accounting, each country follows its

own auditing standard, while the IMF, the World Bank, United Nations Conference on Trade and Development and others have suggested guidelines. What matters, though, is what the DMO does with the audit reports, what measures it puts in place to deal with detected weaknesses and what information is made public. Good DMOs embrace and leverage audits as, among other things, they can be used to enhance market reputation and credit ratings.

A final word on IT systems for debt accounting and their operational risk. Even well-meaning efforts at transparency can fall short if the infrastructure for accounting, reporting and disclosure fails. Debt management information systems come in many shapes—from commercially off-the-shelf to custom-made. But three features separate the good from the bad. One is the capacity to provide comprehensive, timely and reliable data with the click of a mouse. Another is the ability to interface with other systems in the overall public financial management (such as those used for payments, auctions, depository or budgeting). And the third is security, data protection and access controls; the financial and reputational cost of public debt being hacked would be enormous.

5.3. Institutional arrangements for the management of public debt (chapter 10)

Borrowing on behalf of a country is complex and multifaceted. It involves tasks that require technical skill and professional commitment. Think of quantifying the macroeconomic sustainability of debt or the trade-off between cost and risk. Or think of trading billions of dollars in assets, negotiating derivative contracts and keeping books reviewed by the highest-ranking auditor in the land. Difficult as it is, the job is done by a single multidisciplinary team operating out of a public debt office. Its work is supported and, at times, hampered by laws, rules, norms, cultures and relationships—in other words, by the institutional framework. How good is that framework? And how can it be made better?

The first step is authorization: a law—even the constitution—empowering the government to borrow. For example, good authorization sets clear objectives to borrow to fund the budget and develop the domestic capital market. It also sets clear accountability mechanisms to judge and report performance.

Once authorized, a public DMO can be located in the ministry of finance or set up as a separate agency. Placement in the ministry makes coordination with economic policy easier. Being set up as a separate agency, which can range from outsourcing the work to the central bank (e.g., Denmark) to establishing a self-standing agency by executive decision (e.g., UK) or by law (e.g., Ireland), may result in more independent decision-making and more flexible administrative practices (critically, in pay scales).

Next comes transparency. Public borrowing commits taxpayers. They, as well as lenders, ought to be informed of the objectives (why), medium-term strategies (how) and ABPs (when). Transparency means showing and explaining outcomes:

what was achieved, what was not and why. Published financial and performance audits are the tools of choice. Some transactions, such as debt buybacks, cannot be preannounced lest the debt's price rise as a result. Ditto for details of some types of contracts, notably in infrastructure. But the overall principle is clear.

Operationally, a public DMO depends on other parts of government to do its work. Fiscal, monetary, financial and infrastructure policies directly affect how much public borrowing needs to be done and how. Coordination is essential, and conflicts are usual. Budget offices have the ultimate say on funding needs. The central bank makes decisions on interest rates that affect the cost-risk trade-offs in borrowing strategies. Financial regulators may have reasons to limit how much public debt pension funds or insurance companies hold. And the minister of, say, transport may face a once-in-a-lifetime opportunity to see a much-needed highway built by private investors, if only a government guarantee were granted. Not to mention that shocks—from a pandemic to an unexpected jump in commodity prices—can force sudden policy changes which, in turn, can throw debt management strategies off-kilter. These policy interdependencies point to a critical need for fluid, constant and iterative dialogue.

Because it plays a role in many facets of policymaking, trades in the market and reports to a political authority, a DMO needs a special internal organization that protects its integrity. Most DMOs are organized as a trio of front, middle and back offices in charge of trading, strategy and settlements and payments, respectively. While the offices never share responsibilities, they typically share support services—legal, human resources, IT. The offices also share a major problem: staff turnover. Because the skills acquired working for a public debt office are extremely valuable in the private sector, talent retention is a chronic issue. Various solutions have been tried: creating “islands of excellence” in remuneration, continuing training offered by multilaterals, resident advisors paid by donors, etc. But none entirely solves the problem.

However organized, good DMOs are conscious, if not obsessive, about risk. An interruption in their service due to a cyberattack, a loss of records, or a natural disaster can paralyze the government and deliver a significant blow to the economy. Risk awareness and mitigation are central to what public debt managers do. They invest time and money in practices such as risk audits, stress tests, backup systems and continuity plans.

DMOs also put time and money into dialogue, which they lead, with the government's financiers to reduce uncertainty, which translates into lower financing costs. How much to tell investors and how? In a nutshell: as much as legally possible, arranged according to the investors' needs and without creating unfair advantages. This usually means that information on macroeconomic performance and policy decisions comes first, backed up by data tabulated following IMF statistical standards. It calls for publishing medium-term borrowing strategies, ABPs and regular debt bulletins. Increasingly, the documents must reference the borrower's ESG strategy. And it demands accessibility to public officials, a calendar to give predictability to disclosures and accuracy to earn trust. Managing investor relationships is time-consuming, requires a well-thought-out strategy and carries major reputational risks.

Finally, is there a systematic way to benchmark whether a DMO meets the transparency, inter-institutional, organizational and other quality criteria laid out above? Cue the Debt Management Performance Assessment (DeMPA). Launched by the World Bank in 2007 and deployed by more than 150 governments, DeMPA consists of 15 indicators and 35 sub-indicators, each providing a grade from A (sound practice) to D (not meeting minimum requirements). The areas of analysis are governance and strategy, policy coordination, financial transactions, cash management and recording and risk.

Judging by DeMPA results, are most developing-country debt offices up to par? Regrettably not. On average, low- and lower-middle-income countries meet the minimum requirements for less than a third of indicators after the second DeMPA. That is plenty of institution building still to be done.

6. Conclusion

This synthesis provided an overview of what needs to happen for development financing—and public debt—to be sustainable, and borrowers and lenders ought to be aware of it.

To start with, financing is never riskless. It can be made more sustainable through medium-term strategies and their implementation. The trade-off between cost and risk must be decided; no strategy is the worst strategy. A haphazard succession of borrowing operations—perhaps solely maximizing cash in hand—is a formula for trouble.

Methodologies to design strategies and put them in place constantly evolve, not least because markets develop new instruments. Legal, accounting and institutional frameworks must adjust or quickly become obsolete. Even ways to evaluate debt sustainability keep changing, including, recently, the IMF's. Continuing learning and adaptation are imperative—and challenging—in the conservative culture of public debt management.

But innovation and sophistication are no substitute for sound macroeconomic policy and fiscal discipline. Debt managers can do only so much. Sudden realignments of interest or exchange rates, or a loss of confidence in the quality of policymaking, can throw any financing plan off course and have a huge and immediate impact on the debt burden.

Public debt managers must be in the room whenever decisions that financially obligate the government are discussed. The decisions cut across sectors and issues and can as easily be about a straightforward multilateral loan to build a school or a complex guarantee for the private construction of a national port. Fluid relationships and coordination among ministries, agencies and levels of government are essential for sustainable borrowing.

The context will make things more challenging. Everywhere, demand for resilient infrastructure will grow larger and more urgent as the life-changing effects of climate change unfold. With fiscal deficits already swollen by the pandemic, official and commercial lenders will be pressured to do more with their capital. That means more risk-taking and smarter risk management.

All this can be a tall order for DMOs and off-putting to their investor base, so information must be shared between borrowers and lenders **before** signing the dotted line. Transparency *ex ante* is as necessary as transparency *ex post*. MCDF's Workshop Series on Sustainable Financing for Development and Infrastructure, which this handbook serves, is a platform for that.

Reference

International Monetary Fund (IMF). 2021. "Review of the Debt Sustainability Framework for Market Access Countries." IMF Policy Paper 2021/003. Washington, DC.

Chapter 1

Debt Dynamics and Sustainability

Juan Pradelli

Abstract

We explain the dynamics of public debt and identify its main drivers. We show that debt dynamics can be understood through two approaches: a debt manager's perspective focusing on debt issuances and repayments or a fiscal policymaker's perspective observing budget imbalances and financing transactions. Within a comprehensive government's flow of funds, both perspectives are complementary and help understand how and why public debt evolves as influenced by economic performance and government policies. We explain the concepts of solvency and liquidity, i.e., the capacity to repay debt obligations in a medium- to long-term horizon and the capacity to continue borrowing in the short to medium term. Both concepts are critical for assessing the sustainability of public debt. Finally, we discuss applied methodologies for assessing sustainability that rely on accounting identities, analytical conditions and empirical thresholds. Three methodologies developed by international organizations are presented: the International Monetary Fund's (IMF) Debt Dynamic Tool (DDT); the IMF's Sovereign Risk and Debt Sustainability Framework (SRDSF), which is the recent successor to the IMF's Market-Access Country Debt Sustainability Analysis (MAC DSA); and the Low-Income Country Debt Sustainability Framework (LIC DSF) jointly developed by the IMF and the World Bank.

1.1. Basic Concepts: Public Debt Dynamics and the Government's Flow of Funds

Public debt refers to financial claims and obligations between a government and its financiers, including creditors, lenders and investors. When the government borrows, a financing contract sets rights and obligations to its parties. The government gets the right to receive funds from the financiers in the present, to which we call “borrowed funds” obtained in “debt issuances” or “borrowing transactions.” Examples of debt issuances include the sale of sovereign bonds and securities or the disbursement of loans contracted with domestic and international financial institutions. Concurrently, the government becomes liable to pay back those funds to the financiers in the future, to which we call “debt-service obligations” of the government.⁶ Debt-service obligations typically consist of debt repayments, interests and financial charges. The debt repayments (also called amortizations or principal payments) reconstitute the funds lent by the financiers to the government in the first place. Instead, the interest and financial charges compensate them for forgoing the use of funds lent for a period. A detailed analysis of public debt from a legal perspective is presented in chapter 8.

Contractual conditions and financing terms agreed between the government and its financiers shape the borrowed funds and debt-service obligations. Notable among those conditions and terms are the redemption schedule, the applicable interest rates and financial charges and the currency in which funds are to be lent and repaid. Different conditions and terms are often negotiated with the pool of creditors, lenders and investors that typically finance the government. Chapter 2 explains how public debt management strategies can be used to select the conditions for public borrowing.

In the remainder of this section, we present two frameworks for analyzing public debt: the public debt dynamics and the government's flow of funds. We explore the relationship between the government's flow of funds and the financing of infrastructure projects.

1.1.1. Public debt dynamics: the perspectives of a debt manager and a fiscal policymaker

Public debt dynamics is the evolution of a government's public debt stock. Public debt refers to the value of a government's outstanding financial liabilities; it is a stock measured at a certain point in time, e.g., on December 31 or the last day of a fiscal year. There are two approaches to understanding how and why the public debt stock varies or how and why it increases or decreases during a given year (or between any two dates). We refer to these approaches as the debt manager's perspective and the fiscal policymaker's perspective.

⁶ Note that a sovereign also raises funds that may or may not create liabilities. Taxes, other revenues and financing sources, provide the government with (non-borrowed) funds that are not to be repaid: E.g., the government legally owes nothing to taxpayers. Debt issuances, instead, generate (borrowed) funds that must be repaid later, i.e., the government legally owes funds to its creditors, lenders and investors.

The debt manager’s perspective focuses on debt issuances (gross borrowings) and debt repayments (amortizations or principal payments). An increase in the public debt stock occurs when the government borrows funds by issuing new debt during the year of analysis. Examples of debt issuances include the sale of sovereign bonds and securities or the disbursement of loans contracted with domestic and international financial institutions. Debt issuances then refer to the new financial liabilities the government assumes; they are a flow measured over a certain period, e.g., during one calendar or fiscal year. The public debt stock decreases when the government makes debt repayments during the year and thus honors financial obligations falling due, e.g., redemption of maturing sovereign bonds and securities or loan repayments. Debt repayments are the inherited (old) financial liabilities paid off by the government and are a flow variable. In summary, the variation in the public debt stock during the year depends on debt issuances and repayments: If gross borrowings exceed amortization payments, the debt stock increases; otherwise, it decreases.

This approach is dubbed the “debt manager’s perspective” because debt managers are often responsible for borrowing transactions and debt-service obligations. In practice, debt managers are mandated to set policies concerning the contractual conditions and financing terms the government deems adequate when engaging in borrowing transactions. The debt manager’s perspective then answers the question of how public debt evolves: The dynamics of the government debt depend on the difference between new debt being issued and old debt being repaid in any given period. Formally, we obtain the following:

$$(1) \text{Debt}_t - \text{Debt}_{t-1} = \text{Debt Issuances}_t - \text{Debt Repayments}_t$$

where public debt stocks are measured at the end of year t and $t-1$, while debt issuances and repayments are measured during year t .

The fiscal policymaker’s perspective, instead, observes the budget imbalances and financing transactions that are funded with borrowed funds. The government’s fiscal (budget) policies largely determine the income and expenses realized during a year. Government income includes tax revenues (e.g., value-added, income, property and other taxes) and nontax revenues (e.g., charges, fees, dividends paid by state-owned enterprises), while expenses comprise current expenditures (e.g., salaries and wages, purchases of goods and services, transfers and subsidies) and capital expenditures (e.g., acquisition of nonfinancial assets). The difference between annual revenues and expenditures is called the “overall fiscal balance” (or “overall budget balance”). When the government’s expenditures exceed revenues, the fiscal balance is a deficit; if funds are borrowed to cover the excess of expenses over income, the public debt stock increases. In the opposite case, when revenues exceed expenditures, the fiscal balance is a surplus; if funds resulting from the excess of income over expenses are allocated to the repayment of maturing liabilities, the public debt stock decreases. Therefore, the variation in the debt stock during the year largely depends on the overall fiscal balance. If the realized budget is a deficit, the debt stock increases; otherwise, it decreases.

Important financing transactions—not recorded (classified) as budget revenue and expenditure—may also be funded with borrowings. When computing the overall fiscal

balance, a government often has financing sources and needs that are not classified as revenues and expenditures and are distinct from debt issuances and repayments. For instance, financing sources may include using financial assets accumulated when the government has run fiscal surpluses in past years, withdrawals from a sovereign wealth fund or stabilization fund and proceeds from the sale of equity stakes in state-owned enterprises or other types of financial disinvestments. Financing needs may comprise the accumulation of financial assets (e.g., cash and bank balances) when the government runs a fiscal surplus in the current year and decides not to allocate it to debt repayments, contributions to a sovereign wealth fund or stabilization fund and the acquisition of equity stakes in state-owned enterprises or other types of financial investments. The difference between financing needs and sources—which we call “other net financing needs” in this chapter—is akin to the fiscal balance in terms of its impact on the public debt dynamics. If funds are borrowed to afford the excess of financing needs over sources, the public debt stock increases, just as it does when borrowed funds finance a fiscal deficit. In the opposite case, if funds resulting from an excess of financing sources over needs are allocated to the repayment of maturing liabilities, the public debt stock decreases, just as it does when a fiscal surplus generates funds used to service debt. Thus, the overall fiscal balance and the other net financing needs jointly drive the variation in the debt stock during the year.⁷

This approach is called the “fiscal policymaker’s perspective” because the fiscal (budget) and financing policies determine the government’s revenues, expenditures and other important transactions. In practice, fiscal authorities often set budget resources and expenditure allocation policies. By tracking the utilization of the borrowed funds to cover the financial gap emerging from those policies, the fiscal policymaker’s perspective then provides an answer to the question of why the public debt evolves: The dynamics of the government debt depend on the gap between receipts classified as revenues or financing sources and payments classified as expenditures or financing needs. Such a gap must be financed with borrowed funds: specifically, with the proceeds obtained from debt issuances in excess of the funds required to effectuate debt repayments (known as “net borrowings”). Formally, we obtain the following:

$$(2) \text{Debt}_t - \text{Debt}_{t-1} = \text{Overall Fiscal Deficit}_t + \text{Other Net Financing Needs}_t$$

where public debt stocks are measured at the end of year t and $t-1$, while overall fiscal deficit and other net financing needs are measured during year t .⁸

Example #1

The two perspectives help us understand what drove the accumulation of public debt in past years. A simple example illustrates the analysis of public debt dynamics. Consider a hypothetical country named Macroland, whose currency is the MA\$. Table

7 Interactions between overall fiscal balance and other net financing needs give rise to several possibilities as far as the public debt dynamics is concerned. For instance, there may be no variation in the stock of public debt during the year if a fiscal deficit is fully funded with the excess of financing sources over needs, or if a fiscal surplus is fully allocated to fund the excess of financing needs over sources.

8 By breaking down the overall fiscal balance into the primary fiscal balance (which excludes the interest payments from total expenditures) and the interest payments, the dynamics of public debt is often formulated as follows: $\text{Debt}_t - \text{Debt}_{t-1} = \text{Primary Fiscal Deficit}_t + \text{Interest Payments}_t + \text{Other Net Financing Needs}_t$

1 presents the key information concerning fiscal, financing and debt variables for two historical years (2020-2021) and one forecast year (2022). What drove the public debt stock from MA\$100 million at the end of 2020 to MA\$115 million at the end of 2021? A debt manager would answer: “In 2021, the government issued new debt and borrowed funds in the amount of MA\$30 million, and it repaid old debt by MA\$15 million. The excess of debt issuances over repayments—MA\$15 million—accounts for the annual variation in the public debt stock.” In turn, a fiscal policymaker would argue: “In 2021, the government ran a fiscal deficit of MA\$10 million and faced other net financing needs in the amount of MA\$5 million; thus, there was a financial gap of MA\$15 million. The government had to borrow funds of MA\$15 million to finance the gap, which accounts for the annual variation in the public debt stock.” Both answers are complementary and stress how the government’s fiscal, financing and debt-management policies drove public debt dynamics in the past.

The two approaches help project government debt in future years. Let us now consider the prospective dynamics of Macroland’s public debt. What is expected to drive the public debt stock in 2022, starting from MA\$115 million at the end of 2021? A debt manager would answer: “In 2022, the government is anticipated to issue new debt and borrowed funds, as well as to repay old debt, by MA\$10 million and MA\$15 million, respectively. The projected excess of debt repayments over issuances is MA\$5 million, which will reduce the public debt stock to MA\$110 million at the end of 2022.” A fiscal policymaker would argue: “In 2022, the government is anticipated to run a fiscal surplus of MA\$15 million and face other net financing needs of MA\$10 million. Thus, non-borrowed funds (to which we refer as “own resources”) totaling MA\$5 million will be available to make some of the debt repayments due, which will lead to a reduction in the stock of public debt to MA\$110 million at the end of 2022.” Both answers now emphasize how public policies expected to be pursued will drive public debt dynamics in the future.

Table 1.1. Macroland Government’s Fiscal, Financing and Debt Data

Figures in MA\$ million	Codes & Calculations	2020 (historical)	2021 (historical)	2022 (forecast)
Public Debt Stock at end-of-year	10	100	115	110
Annual Variation in Debt Stock	11		15	-5
Debt Manager’s Approach	7-8		15	-5
Fiscal Policy Maker’s Approach	-3+6		15	-5
Fiscal & Financing Indicators				
Revenues	1		20	40
Expenditures	2		30	25
Overall Fiscal Balance	3=1-2		-10 (deficit)	15 (surplus)
Financing Needs	4		10	10
Financing Sources	5		5	0
Other Net Financing Needs	6=4-5		5	10
Debt Issuances (Gross Borrowings)	7		30	10
Debt Repayments (Amortizations)	8		15	15
MEMO				
Non-Borrowed Funds	9=1-2+5-4		-15 (deficit)	5 (surplus)

Source: Author.

1.1.2. Other Factors Driving the Public Debt Dynamics: Contingent Liabilities and Valuation Effects

Public debt dynamics are driven not only by net borrowings raised to fund budget imbalances and financing transactions but also by contingent liabilities and valuation effects. In addition to the factors already stressed by the debt manager's and fiscal policymaker's perspectives, the evolution of the public debt also reflects two other important drivers: the assumption of financial liabilities by the government as a result of contingencies ("contingent liabilities"); and the changes in the local-currency value of foreign currency-denominated debts (bonds, securities, credits, loans and other financial liabilities) as a consequence of fluctuations in the market exchange rates between the local and foreign currencies ("valuation effects"). Those factors—which are further explained below—can be added to equations (1) and (2) describing the public debt dynamics:

$$(3) \text{ Debt}_t - \text{Debt}_{t-1} = \text{Debt Issuances}_t - \text{Debt Repayments}_t + \text{Recognition of Contingent Liabilities}_t + \text{Valuation Effects}_t$$

$$(4) \text{ Debt}_t - \text{Debt}_{t-1} = \text{Overall Fiscal Deficit}_t + \text{Other Net Financing Needs}_t + \text{Recognition of Contingent Liabilities}_t + \text{Valuation Effects}_t$$

where public debt stocks are measured at the end of year t and $t-1$, while debt issuances, debt repayments, overall fiscal deficit, other net financing needs, the recognition of contingent liabilities and the valuation effects are measured during year t .

Public debt includes financial obligations the government assumes following the realization of contingent events, all impacting its dynamics. The government may be obliged to make payments to other entities or individuals to comply with "contingent liabilities" stemming from various events, e.g., legal mandates, litigation and judiciary rulings, recognition of rights to individuals or social groups (e.g., reparations), guarantees extended to debtors that are called when these fail to honor their own debts, bailouts to companies and banks and other similar cases. (A detailed analysis of contingent liabilities is presented in chapter 6.) Notably, those liabilities create future payment obligations for the government but do not provide it with borrowed funds. So the flow of funds runs in one direction only, from the government to the entities or individuals benefiting from the contingencies. The situation is different from the debt issuances discussed thus far, where the financing arrangements between the government and its financiers imply a bidirectional flow of funds, i.e., funds borrowed in the first place and repaid later. As far as the public debt dynamics is concerned, the realization of contingent liabilities may lead to a one-off increase in the stock of government debt in a given year, as indicated in equations (3) and (4).⁹

Public debt often includes liabilities denominated in foreign currencies whose value expressed in local currency depends on the market exchange rates (i.e., parities

⁹ In future years, the payments associated with the recognized contingent liabilities may be accounted for as expenditures, financing needs or debt repayments, depending on the accounting conventions used. The formal equations (3) and (4) reflect exclusively the one-off increase in the level of public debt when contingent liabilities are recognized.

between currencies). Public debt typically includes liabilities denominated in various currencies, including the local currency and major foreign currencies. The government may issue foreign currency-denominated debts when borrowing from foreign and domestic financiers. They prefer to lend in foreign currencies to avoid being exposed to currency risk, which is the risk that exchange rate fluctuations reduce the foreign-currency value of local currency-denominated financial claims against the government.

The local-currency value of foreign currency-denominated debts fluctuates with exchange-rate movements, and this has an impact on the public debt dynamics. Public debt is the value of a government's outstanding financial liabilities measured on a specific date. Such value must be expressed in a currency, often the local currency for analytical and reporting purposes or the United States (US) dollar for international comparisons. Market exchange rates between local and foreign currencies prevailing on a certain date are then used for currency conversions required to calculate the local currency value of all foreign currency-denominated debts. The stock of public debt is then computed by aggregating the local-currency value of all the government's financial liabilities. But changes in the public debt stock—precisely the object of the public debt dynamics in equations (3) and (4)—occur whenever there are variations in the market exchange rates used for currency conversions. The stock of public debt increases when the local currency depreciates against foreign currencies and raises the local-currency value of foreign currency-denominated liabilities. In contrast, the public debt stock decreases when the local currency appreciates against foreign currencies and reduces the local-currency value of foreign currency-denominated liabilities. These changes are referred to as “valuation effects” and depend on the magnitude of the exchange-rate movements and the size of the foreign-currency debts. In practice, countries undergoing external trade or financial crises involving a large depreciation of the exchange rate between the local and foreign currencies may experience a significant one-off increase in the level of public debt. The larger the foreign currency-denominated debts when the currency depreciation occurs, the larger the one-off increase in public debt.¹⁰

Exchange-rate movements affect the local-currency value of the stock of foreign currency-denominated debts inherited from the previous year and the net-issuance flow of new debts during the present year. Consequently, the valuation effects introduced in equations (3) and (4) comprise two elements: (i) the change in the local-currency value of the inherited stock of foreign currency-denominated liabilities, which results from the variation in the market exchange rates prevailing on the last date of the previous year and the last date of the current year; and (ii) the change in the local-currency value of the debt issuance (net of repayment) of foreign currency-denominated liabilities, which results from the variation in market exchange rates prevailing whenever the net debt issuance occurs during the current year and the last date of the same year.¹¹ In practice, the daily exchange rate observed on the last date of a year is called the “end-of-period exchange rate,”

10 Currency risk emerges precisely from the possibility that the local currency may unexpectedly depreciate (devalue) against foreign currencies in the future, and thus bring about adverse valuation effects—a value loss—for financiers that hold local currency-denominated financial claims against the government while they are truly concerned with the foreign-currency value of said claims.

11 The second element is called stock-flow adjustment in several studies.

while the average daily exchange rate observed throughout the year is called the “average-period exchange rate.” The two elements of the valuation effects can be formally expressed by equations (5) and (6):

$$(5) \text{ Valuation Effects}_t = FXDebt_{t-1} * (EReop_t - EReop_{t-1}) + (FXDebtIssuances_t - FXDebtRepayments_t) * (EReop_t - ERavp_t)$$

$$(6) \text{ Valuation Effects}_t = FXDebt_{t-1} * (EReop_t - EReop_{t-1}) + (FXDebt_t - FXDebt_{t-1}) * (EReop_t - ERavp_t)$$

where stocks, issuances and repayments of foreign currency-denominated debts (denoted as *FX Debt*, *FX Debt Issuances* and *FX Debt Repayments*, respectively) are expressed in foreign-currency values; the end-of-period exchange rate (*EReop*) is measured at the end of year *t* and *t-1*; and the average-period exchange rate (*ERavp*) is measured during year *t*.

Example #2

We illustrate the calculation of valuation effects using the case of Macroland. Table 1.2 contains the key information on fiscal and financing variables introduced in Table 1.1. Table 1.2 also presents the exchange rates between the local (MA\$) and foreign currency (USD) and the breakdown of public debt stock, issuances and repayments by the two currencies. Thus, for instance, the public debt stock was MA\$100 million at the end of 2020 and consisted of two components: (i) the MA\$-denominated debt stock, whose local-currency value was MA\$70 million and (ii) the USD-denominated debt stock, whose local-currency value was MA\$30 million (computed as the original value in foreign currency [USD15 million] multiplied by the exchange rate at the end of 2020 [2 MA\$ per USD]).

What drove the public debt stock from MA\$100 million at the end of 2020 to MA\$130 million at the end of 2021? We have explained that MA\$15 million of additional debt results from excess debt issuances over repayments (the debt manager’s approach) or, alternatively, from the funding of fiscal deficit and other net financing needs (the fiscal policymaker’s approach). This is the net issuance of public debt during 2021 resulting from the government’s fiscal, financing and debt-management policies.

Another factor must be considered: the valuation effects described in equations (5) and (6). Note that the local currency (MA\$) depreciated against the foreign currency (USD) during 2021; the exchange rate increased from 2 MA\$ per USD at the end of 2020 to 3 MA\$ per USD at the end of 2021, with an average value of 2.5 MA\$ MA\$2.5 per USD throughout 2021. As a result, the local-currency value of the USD-denominated debt stock inherited from the end of 2020 increased from MA\$30 million at the end of 2020 to MA\$45 million at the end of 2021 (computed as the original value in foreign currency [USD15 million] multiplied by the exchange rate at the end of 2021 [(3 MA\$ per USD)]). The valuation effect amounts to MA\$15 million and helps answer why the public debt stock grew from MA\$100 million to MA\$130 from the end of 2020 to the end of 2021.

The valuation effect indicated above is the change in the local-currency value of the inherited stock of foreign currency-denominated liabilities. It corresponds to the first term of equations (5) and (6). The second term in both equations represents the change in the local-currency value of the net issuance of foreign currency-denominated liabilities (i.e., debt issuances net of repayments), which is zero in 2021 because both issuances and repayments are identical (USD5 million).

The analysis can be extended to government debt projections in future years. What is expected to drive the public debt stock in 2022 down from MA\$130 million at the end of 2021 to MA\$116.5 million at the end of 2022? The debt stock is anticipated to decrease by MA\$5 million due to excess debt repayments over issuances (the debt manager's approach) or, alternatively, from the excess of fiscal surplus over other net financing needs (the fiscal policymaker's approach). This is the net repayment of public debt projected for 2022.

Now, the projected exchange rate dynamics also contribute to reducing the local-currency value of the public debt stock via the valuation effects. The local currency (MA\$) is expected to appreciate against the foreign currency (USD) during 2022. The exchange rate will decrease from 3 MA\$ per USD at the end of 2021 to 2.5 MA\$ per USD at the end of 2022, with an average value of 2.7 MA\$ per USD throughout 2022. As a result, the local-currency value of the USD-denominated debt stock inherited from the end of 2021 is projected to decrease from MA\$45 million at the end of 2021 to MA\$37.5 million at the end of 2021 (computed as the original value in foreign currency [USD15 million] multiplied by the exchange rate at the end of 2022 [(2.5 MA\$ per USD)]). The valuation effect implies another reduction in the local-currency value of debt by MA\$7.5 million, and it is the first term of equations (5) and (6).

A net issuance of USD-denominated public debt of USD5 million is anticipated for 2022. While the debt flow will have a local-currency value of MA\$13.5 million when it unfolds (calculated using the expected average exchange rate during 2022, i.e., 2.7 MA\$ per USD), it will later become a debt stock with a local-currency value of MA\$12.5 million at the end of the year (calculated using the expected exchange rate at the end of 2022, i.e., 2.5 MA\$ per USD). The valuation effect implies a further reduction in the local-currency value of debt by MA\$1 million, and it is the second term of equations (5) and (6). Adding the valuation effects discussed, the local-currency value of the public debt stock will be reduced by MA\$8.5 million because of the currency appreciation anticipated for 2022 (Table 1.2).

Finally, the projected net repayment of public debt and the valuation effects jointly explain the expected reduction in the public debt stock from MA\$130 million at the end of 2021 to MA\$116.5 million at the end of 2022.

Table 1.2. Macroland Government's Macroeconomic, Fiscal, Financing and Debt Data

Figures in MA\$ million (unless otherwise specified)	Codes & Calculations	2020 (historical)	2021 (historical)	2022 (forecast)
Public Debt Stock at end-of-year	$10=10a+10b^{*12}$	100,0	130,0	116,5
MA\$-denom. Debt Stock (MA\$ million)	10a	70,0	85,0	66,5
US\$-denom. Debt Stock (US\$ million)	10b	15,0	15,0	20,0
Annual Variation in Debt Stock	11		30,0	-13,5
Debt Manager's Approach	$7-8+14$		30,0	-13,5
Fiscal Policy Maker's Approach	$-3+6+14$		30,0	-13,5
Exchange Rates				
Exchange Rate at end-of-year (MA\$ per US\$)	12	2,0	3,0	2,5
Exchange Rate average-during-year (MA\$ per US\$)	13		2,5	2,7
Fiscal & Financing Indicators				
Revenues	1		20	40
Expenditures	2		30	25
Overall Fiscal Balance	$3=1-2$		-10 (deficit)	15 (surplus)
Financing Needs	4		10	10
Financing Sources	5		5	0
Other Net Financing Needs	$6=4-5$		5	10
Debt Issuances (Gross Borrowings)	$7=7a+7b^{*13}$		27,5	13,5
MA\$-denom. Debt Issuance (MA\$ million)	7a		15,0	0,0
US\$-denom. Debt Issuance (US\$ million)	7b		5,0	5,0
Debt Repayments (Amortizations)	$8=8a+8b^{*13}$		12,5	18,5
MA\$-denom. Debt Repaym. (MA\$ million)	8a		0,0	18,5
US\$-denom. Debt Repaym. (US\$ million)	8b		5,0	0,0
Valuation Effects				
Valuation Effects	$14=14a+14b$		15,0	-8,5
V. E. on Initial US\$-denom. Debt Stock	14a		15,0	-7,5
V. E. on Net Issuance of US\$-denom. Debt Flow	14b		0,0	-1,0
MEMO				
Non-Borrowed Funds	$9=1-2+5-4$		-15 (deficit)	5 (surplus)

denom. = denominated, repaym. = repayment, V. E. = valuation effect.
Source: Author.

1.1.3. The Government's Flow of Funds

The flow of funds reflects the accounting identity between all the government's receipts generated and payments made during a specific period. The accounting identity states that any receipt on the left-hand side of equation (7) (classified as revenue, financing source or debt issuance) must be allocated to a certain payment on the right-hand side (classified as expenditure, financing need or debt issuance).

Conversely, any payment must be funded by a certain receipt.¹² Formally, we obtain the following:

$$(7) \text{ Revenues}_t + \text{Financing Sources}_t + \text{Debt Issuances}_t = \text{Expenditures}_t + \text{Financing Needs}_t + \text{Debt Repayments}_t$$

where all variables are measured during year t .

The government's flow of funds is the accounting identity from which the debt manager's and the fiscal policymaker's perspectives on the public debt dynamics are derived. Consider the rearrangement of receipts and payments in equation (8). A debt manager sees the left-hand side and notes that debt issuances and repayments drive the annual variation in public debt. A fiscal policymaker, instead, observes the right-hand side and concludes that budget imbalances and financing transactions drive the evolution of public debt. The two approaches look at different components of the government's flow of funds, placing public debt dynamics within the comprehensive accounting of public finances.

$$(8) \text{ Debt Issuances}_t - \text{Debt Repayments}_t = (\text{Expenditures}_t - \text{Revenues}_t) + (\text{Financing Needs}_t - \text{Financing Sources}_t)$$

where all variables are measured during year t .

The government's flow of funds is not directly affected by contingent liabilities and valuation effects. It does not relate to the assumption (recognition) of contingent liabilities in the current year since the liabilities do not provide the government with borrowed funds—as indicated earlier. New payment obligations in future years associated with the contingent liabilities recognized today will be included in the flow of funds corresponding to those years. Besides, the flow of funds is not affected by the valuation effects on the public debt stock in the current year because it captures the flow of debt issuances and repayment during that year, as opposed to the stock of debt on a certain date. If a currency depreciation in the present affects the exchange rates permanently and thus increases the local-currency value of receipts and payments accrued in foreign currency in future years, the effect will be reflected in the flow of funds corresponding to those years. A similar situation—although in the opposite direction—emerges when a currency appreciation in the present reduces the local-currency value of receipts and payments accrued in foreign currency in future years.¹³

The flow of funds helps in understanding the gross borrowings (debt issuances) and associated proceeds that the government must secure to cover the financial gap emerging from its policies. Consider yet another rearrangement of receipts and

¹² When a receipt is saved and not spent in the current year, it is allocated to the accumulation of financial assets, which is accounted for as a financing need in the right-hand side of equation (7), so the equality holds. Similarly, when a payment is funded with financial assets saved in the past and not with a receipt generated in the current year, the use of those assets is accounted for as a financing source in the left-hand side of equation (7), so the equality holds.

¹³ Receipts accrued in foreign currency may include taxes and nontax revenues surrendered in foreign currency, returns from investments overseas undertaken by a sovereign wealth fund, returns from the central bank's international reserves that are transferred to the government, profits from exporting state-owned enterprises surrendered in foreign currency to the government, etc. Payments accrued in foreign currency may include expenditures in imported goods and services, interests and amortizations on foreign currency-denominated debts, and subsidies given by the government to importing state-own enterprises that are paid in foreign currency, etc.

payments in equation (9). Gross borrowings (debt issuances on the left-hand side) are required to raise finance to fund budget imbalances, debt repayments and other net financing needs during a year (all of them on the right-hand side):

$$(9) \text{ Debt Issuances}_t = (\text{Expenditures}_t - \text{Revenues}_t) + \text{Debt Repayments}_t + (\text{Financing Need}_t - \text{Financing Sources}_t)$$

where all variables are measured during year t .

In practice, three measures are widely used in relation to gross borrowings and associated proceeds generated from public debt: (i) “gross financing needs” (GFN)—computed as the sum of fiscal deficit, debt redemptions and financing needs—indicate how much finance must be raised through borrowings and other financing sources; (ii) “gross borrowing requirements”—computed as the sum of fiscal deficit, debt redemptions and other net financing needs—measure how much finance must be raised exclusively through borrowing; and (iii) “net borrowing”—calculated as the difference between debt issuances and repayments—indicates how much finance is effectively raised through borrowing transactions after covering the repayments of maturing liabilities. From a conceptual viewpoint, the three measures quantify the debt issuances necessary to balance out all receipts and payments of the government in a year.

Example #3

Each of the two perspectives on public debt dynamics observes a certain subset of funds and transactions reflected in the government’s flow of funds. The example of Macroland can be used to illustrate the government’s flow of funds. Table 3 rearranges the key information presented in Table 1. Total receipts generated as revenues, financing sources and debt issuances add up to MA\$55 million in 2021. Total payments made as expenditure, financing needs and debt repayments amount to the same figure, as per the accounting identity. Notably, the debt manager’s perspective focuses on the subset of receipts and payments that directly impact the government’s financial liabilities: Debt issuances are receipts that create new liabilities providing borrowed funds, and amortizations are payments that redeem old liabilities maturing in the period of analysis. In contrast, the fiscal policymaker’s perspective observes the non-borrowed receipts and non-debt-related payments (except interests and financial charges, which are classified as expenditures), i.e., the subset of funds and transactions that indirectly impact the government’s financial liabilities whenever borrowed funds are required to balance them out. In the example of Macroland, the debt manager would stress the “gross borrowings” (MA\$30 million) and “net borrowings” (MA\$15 million) in 2021. The fiscal policymaker would instead focus on the “gross financing needs” (MA\$35 million) and “gross borrowing requirements” (MA\$30 million) in the same year. The gap between non-borrowed receipts (MA\$25 million) and non-debt-related payments (MA\$40 million) is generated by fiscal and financing policies pursued by the fiscal authorities. Such a gap is to be funded with the “net borrowings” (MA\$15 million) secured by the debt managers.

The government's flow of funds is useful for projecting the government's gross borrowing requirements in future years. Let us now consider the prospective gross borrowing requirements of Macroland. What funding should be raised in 2022, given budget imbalances, debt repayments and other net financing needs expected to emerge from government policies? The fiscal policymakers would answer: "On the one hand, the government is anticipated to run a fiscal surplus of MA\$15 million in 2022 and, on the other hand, it is expected to afford financing needs of MA\$10 million and repay maturing debt by MA\$15 million. Because no financing sources are foreseen, borrowing and issuing debt of MA\$10 million is required, which is the projected gross borrowing requirements for 2022."

Table 1.3. Macroland Government's Flow of Funds and Debt Dynamics

Figures in MA\$ million	Codes & Calculations	2021 (historical)	2022 (forecast)
Total Receipts	$1+5+7$	55	50
Revenues	1	20	40
Financing Sources	5	5	0
Debt Issuances (Gross Borrowings)	7	30	10
Total Payments	$2+4+8$	55	50
Expenditures	2	30	25
Financing Needs	4	10	10
Debt Repayments (Amortizations)	8	15	15
MEMO			
Non-Borrowed Funds	$9=1-2+5-4$	-15 (deficit)	5 (surplus)
Net Borrowings (Net Issuance)	$7-8$	15	-5
Gross Financing Needs	$2-1+8+4$	35	10
Gross Borrowing Requirements	$2-1+8+4-5$	30	10

Source: Author.

1.1.4. Government's capacity to borrow and demand for public debt

The government can steadily raise borrowed funds through debt issuances if and when there is demand for public debt in the first place. Our analysis has emphasized the government's need to borrow to support its flow of funds. The gross borrowing requirements quantify the government's needs for borrowed funds and are distinct from the financiers' incentives to lend funds. Intuitively, while the government's gross borrowing requirements relate to the "supply of public debt" (or "demand for funds"), the financiers' incentives underpin the "demand for public debt" (or "supply of funds"). In practice, a strong investors' appetite for sovereign bonds and securities and a sustained flow of credit and loans provided by domestic banks, international financial institutions and official lenders ultimately allow the government to rely on borrowed funds to finance various payments. Hence, the markets and institutions associated with the government's borrowing transactions and public debt shape the flow of funds.¹⁴

¹⁴ The demand for public debt poses important questions: Why are the financiers willing to lend funds and hold public debt? How do market-based financiers allocate their portfolios between sovereign bonds and securities and other investment opportunities? How do government policies—e.g., financial regulation, monetary policy—affect the demand for public debt?

Growing demand for public debt allows the government to raise an increasing volume of borrowed funds and pay maturing obligations seamlessly. It thus has an impact on the public debt dynamics. Growing demand for public debt means that financiers are willing to expand their holdings of claims against the government, i.e., to increase the stock of public debt held in their portfolios.¹⁵ To do so, they have to lend the government an annual flow of funds that increases year after year and always exceeds the amount necessary to repay maturing liabilities in any given year. Facing an expanding demand for public debt, the government can access borrowed funds to finance not only debt repayments but also budget imbalances and financing transactions. Thus, the public debt stock will increase, reflecting growing demand and increasing gross borrowing requirements.

1.1.5. Flow of funds and investment financing: some practical considerations

Debt issuances provide the government with borrowed funds that may be earmarked for specific expenditures or have no predefined utilization or purpose. Equation (10) shows the possible uses (allocations) of the borrowed funds raised by issuing debt, which are the first four terms on the right-hand side:

$$(10) \text{ Debt Issuances}_t = \text{Current Expenditures}_t + \text{Capital Expenditures}_t + \text{Financing Needs}_t + \text{Debt Repayments}_t - (\text{Revenues}_t + \text{Financing Sources}_t)$$

where all variables are measured during year t .

Borrowed funds may or may not be earmarked for specific budget allocations. For instance, the disbursement of loans contracted with domestic and international financial institutions is typically earmarked to fund capital expenditures. Thus, funds must be allocated to payments of eligible expenditures or the reimbursement of those payments if they were already effectuated. This is the normal practice in development financing for infrastructure projects, an arrangement generically referred to as “investment financing.” A detailed analysis of financing arrangements for infrastructure projects is presented in chapter 7. In contrast, sovereign bonds and securities issuance often raises finance not directly tied to any specific utilization or purpose. Thus, the government can freely allocate funds to any payment, e.g., current or capital expenditures, debt repayments or financing needs, including building up a stock of financial assets for cash management purposes. International financial institutions provide loans to governments where development financing intends to support and incentivize the adoption of policy reforms and initiatives. Called a “development policy loan,” “policy-based loan” or a similar term, this financing arrangement is typically not earmarked for any specific budget allocation and is generically referred to as “budget support.”

¹⁵ Various factors explain why financiers may want to increase their holdings of public debt. For instance, market investors may find it profitable to increase financial returns from (and exposure to) sovereign bonds and securities. Domestic banks may want to expand their liquidity position, often invested in short-term bonds and bills due to regulatory advantages. Pension funds and insurance companies may prefer to invest in long-term bonds and securities to match their obligations with future retirees and insureds, respectively. International financial institutions and official lenders may seek to promote the economic and social development of borrowing countries.

The government's flow of funds helps understand the inflows and outflows involved in an investment project loan and its repayment. When the lender disburses an investment-financing loan, the government receives an inflow of funds (the loan proceeds) to finance an outflow of funds (the capital expenditures). A fiscal policymaker will then observe a larger budget deficit (or lower budget surplus) due to the additional expenditures and a larger flow of financing provided by the loan disbursement. When the loan matures and funds are to be restituted to the lender, the government finances an outflow of funds (loan repayment) with either its "own resources" (i.e., non-borrowed funds) or newly borrowed funds, as will be explained in the next section. The fiscal policymaker will then note either an increase in the total surplus generated from budget flows and financing transactions or an increase in borrowings. Either way, funds must be allocated to repay the loan. The analysis of the flow of funds stresses the double role played by an investment-financing loan: While the loan disbursement expands the financial means available for the government to undertake a capital project, the loan repayment absorbs the government's own resources or borrowed funds and thus reduces the financial means available for other purposes.

An investment-financing loan is worth contracting as long as it is expected to positively affect the country's economy and the government's public finances in the foreseeable future. The capital project funded with the said loan should contribute to expanding economic activity and boosting growth potential, e.g., by building up infrastructure, improving technologies, modernizing institutions and enhancing jobs and skills. Such a contribution depends on three crucial elements: (i) the fiscal multipliers of government expenditures, i.e., how much the additional investment spending contributes to additional economic output and incomes measured by the gross domestic product (GDP); (ii) the build-up of capital stocks (e.g., physical assets in infrastructure, machinery, buildings) depending on the quality of public investment management, and their effects on the country's long-term growth potential, i.e., how much the additional investment spending raises the existing capital stock and, subsequently, how much the additional capital stock boosts the economy-wide growth potential; and (iii) the quality of public policies to capture increased revenues resulting from the infrastructure investment. The public policies in place—especially those related to revenues and financing sources—should ensure that the improved performance of the country-wide economy boosts the government's own resources, e.g., by widening tax bases and enhancing tax-administration efficiency. This would enable the government to generate more own resources in the future—compared with a situation where neither the loan nor the capital project takes place—and thus mitigate the impact of the loan repayment on its financial means and other policy objectives reflected in the flow of funds. In the next section, the notions of solvency, liquidity and public debt sustainability relate to economic performance, government policies and investment financing.

1.2. Solvency, Liquidity and Public Debt Sustainability

In this section, we present the notions of solvency and liquidity applied to a government debtor, which underpin the definition of public debt sustainability. We explore how solvency and liquidity relate to the government's flow of funds and debt dynamics and present another fundamental element for analyzing public debt: the government's intertemporal budget constraint. The contribution of investment financing for capital projects to solvency is also discussed.

1.2.1. Flow of funds and two options for funding debt repayments: own resources and debt rollovers

Debt repayments corresponding to maturing financial liabilities are financed with borrowed or non-borrowed funds (own resources). Consider another rearrangement of the government's flow of funds in equation (11). Debt repayments (on the left-hand side) can be funded either with borrowed funds (first term on the right-hand side) or own resources (second term). There are then two options to fund the debt repayments, and whichever the government chooses has implications for the public debt dynamics.

$$(11) \text{ Debt Repayments}_t = \text{Debt Issuances}_t + ((\text{Revenues}_t - \text{Expenditures}_t) + (\text{Financing Sources}_t - \text{Financing Needs}_t))$$

where all variables are measured during year t .

Amortization (principal) payments may be financed with borrowed funds, thus maintaining the level of public debt. When the government affords the annual debt repayments using borrowed funds raised through debt issuances in the same year, it effectively redeems old liabilities falling due while creating new liabilities, or a "debt rollover." As new debts replace old debts, there is no variation in the public debt stock.

Alternatively, amortization (principal) payments may be financed with non-borrowed funds, i.e., own resources, reducing the level of public debt. When the annual debt repayments are financed with non-borrowed funds, the government is redeeming old liabilities maturing without creating new liabilities, using own resources to repay public debt. The public debt stock is reduced as old debts are retired without new debts being made.¹⁶

How the government funds debt repayments is essential to the public debt dynamics and underpins the notions of solvency and liquidity. The government effectively

¹⁶ We stress that the mere budgeting allocation of revenues and financing sources to debt repayments of specific liabilities does not necessarily lead to reducing the total stock of public debt. For the total stock of public debt to effectively decrease during the year, there must be a total surplus between fiscal balance and other net financing needs. Intuitively, the revenues and financing sources not allocated to debt repayments must be sufficient to fund expenditures and financing needs. Otherwise, issuing new liabilities may still be necessary and such debt issuances may offset the debt-reducing impact of allocating (in a purely budgetary sense) some revenues or financing sources to fund certain debt repayments.

reduces the public debt stock if and when it can generate own resources and allocate those resources to repay maturing liabilities. The government, however, maintains the public debt stock unchanged if and when it can access borrowed funds and roll over maturing debts. Recognizing these two sources of funding for debt repayments is at the core of the notions of solvency and liquidity.

Example #4

The example of Macroland illustrates how debt repayments are funded. Table 1.4 rearranges the key information presented earlier in Table 1.1. Debt repayments were MA\$15 million in 2021, and the government financed them—together with the fiscal deficit—with borrowed funds. As gross borrowings exceeded amortization payments, a net issuance of financial liabilities amounting to MA\$15 million was added to the public debt stock. As for 2022, projected debt repayments are also MA\$15 million, but now the government is expected to finance them by combining own resources (MA\$5 million) and borrowed funds (MA\$10 million). As amortization payments exceed gross borrowings, a net repayment of financial liabilities totaling MA\$5 million will reduce the public debt stock.

Table 1.4. Macroland Government's Flow of Funds and Debt Repayments

Figures in MA\$ million	Codes & Calculations	2021 (historical)	2022 (forecast)
Debt Repayments (Amortizations)	8	15	15
Funded with ...			
Debt Issuances (Gross Borrowings)	7	30	10
Non-Borrowed Funds	9=1-2+5-4	-15 (deficit)	5 (surplus)
Fiscal & Financing Indicators			
Revenues	1	20	40
Expenditures	2	30	25
Overall Fiscal Balance	3=1-2	-10 (deficit)	15 (surplus)
Financing Needs	4	10	10
Financing Sources	5	5	0
Other Net Financing Needs	6=4-5	5	10

Source: Author.

1.2.2. Solvency and liquidity

Solvency refers to a debtor's capacity to generate "own resources" to repay maturing debt over a medium- to long-term horizon, while liquidity refers to its ability to access borrowed funds to roll over maturing debt in a short- to medium-term horizon. A government debtor is solvent when the market participants—including the government itself, its financiers, credit-rating agencies, international organizations, the public and other parties—expect it to be able (and willing) to generate own resources in the foreseeable future and allocate them to debt repayments as they fall due. A government debtor is liquid when market participants anticipate it to be able (and willing) to access borrowed funds at reasonable costs (e.g., low interest and coupon rates, long maturities) and allocate

them to redeem maturing liabilities through debt rollovers, as well as to meet other gross financing needs in the foreseeable future. In summary, solvency can be associated with the government's "repayment capacity" in the medium- to long term, while liquidity relates to its "borrowing capacity" in the short to medium term. An analytical formulation for the notions of solvency and liquidity, known as the government's intertemporal budget constraint, is introduced later in this section. More practical considerations for the notion of liquidity within the context of the government's debt management and borrowing strategies are presented in chapter 2.

What makes a government debtor solvent and liquid—i.e., able (and willing) to repay debt and borrow funds—are country-wide and global economic performance and the government's own policy framework now and in the future. The government's solvency and liquidity largely depend on the prospective economic outlook, the public policies in place or those that can realistically be adopted in the foreseeable future through new reforms and initiatives. For instance, policies to robustly mobilize revenues, effectively manage and control expenditures and enable sound financing transactions are essential to assess whether a government is solvent and can generate own resources now and later. Similarly, measures to secure financial market stability, strong investor demand (appetite) for government securities, and sound sovereign credit ratings are key to evaluating whether a government is liquid and can secure borrowed funds now and later. The universe of government policies—including the institutional mechanisms to formulate, approve, implement, review and communicate them—is often called the "policy framework" of a country.

Repayment capacity, borrowing capacity and the confidence of market participants are intertwined. Confidence in the government's repayment capacity ultimately rests on the expected economic outlook and the current policy framework, which support the ability to generate own resources. As long as such confidence holds, there will be demand for public debt, and the government will have borrowing capacity to access funding at reasonable costs and meet its financing needs. As a solvent government is perceived to be able (and willing) to repay maturing debt in the future, market participants are likely to lend to it today on mutually acceptable contractual conditions and financing terms. If so, then the government is also able (and willing) to access borrowed funds and be both solvent and liquid.¹⁷

Investment-financing loans contribute to the government's solvency to the extent that the capital projects being funded are realistically expected to boost economic activity, expand budget revenues and strengthen repayment capacity in the medium to long term. The loans can potentially create the resources necessary to secure their own repayment (completely or partially) and are thus worth contracting for the government and its financiers. The government will be able to generate more own resources to repay the loans to the extent that: (i) fiscal multipliers are large; (ii) high-quality, well-managed public investment builds

¹⁷ Abnormal market disruptions could still make a solvent debtor face illiquidity. For instance, global or regional systemic liquidity crunches can reduce financiers' own capacity (and willingness) to lend funds. Information asymmetries and differing views among market participants regarding whether a government is solvent can also trigger a credit crunch. For instance, self-fulfilling prophecies, whereby an unwarranted suspicion that the government may not service maturing debt leads financiers to curtail further lending, can result in a credit crunch that (by itself) makes the government unable to secure borrowed funds to honor debt repayments and validates the suspicion, even if it is baseless.

up productive capital assets; and (iii) public policies lead to securing additional revenues and financing sources overall. Additional resources for the government may result from revenue-generating projects (e.g., a tolled bridge or highway) or taxation of economic activities boosted by the capital projects themselves (e.g., income and consumption taxes raised on the additional economic output and incomes measured by the GDP). If these conditions are met, and the economic outlook is favorable, the government's solvency will be strengthened. Financiers will be confident that repayment of investment-financing loans in future years is feasible with high probability.

Investment-financing loans also contribute to the government's solvency by allowing for countercyclical fiscal policy and macroeconomic stabilization. Loan access is essential for economic and social development under normal circumstances. But the loans also help cope with unexpected adverse circumstances, e.g., negative external shocks, a pandemic, cyclical downturns, and implementing countercyclical fiscal policies to mitigate shocks and stabilize the macroeconomy. Since such policies often require scaling up public spending during recessions and revenue shortfalls, access to investment-financing loans and other borrowed funds permits bridging the emerging financial gap. Furthermore, to the extent that macroeconomic stabilization in the short to medium term helps preserve long-term growth potential and the government's repayment capacity, it reinforces market participants' confidence in the government's present solvency.

1.2.3. Public debt sustainability

Public debt is sustainable when the government is both solvent and liquid. Thus, what makes public debt sustainable is the confidence (expectation) that—given a favorable economic outlook and an adequate policy framework—the government can safely fund debt repayments falling due in the foreseeable future because it possesses the ability (and willingness) to generate own resources (repayment capacity) and to access borrowed funds (borrowing capacity).¹⁸ From the perspective of the flow of funds, the public debt is sustainable when the government can balance out all its receipts and payments in a multiyear (intertemporal) horizon—by repaying debts over the medium to long term with own resources, while rolling them over in the short to medium term.

Public debt sustainability is intrinsically related to government policies. Since fiscal, financing and debt-management policies largely determine the financial obligations of the government and its repayment and borrowing capacity, the notion of debt sustainability is often expressed in terms of the adequacy and continuity of the current policy framework. Thus, from a policy perspective, public debt is sustainable when the government can (and is willing to) service financial liabilities maturing in the foreseeable future within the current policy framework and economic outlook without ever having to: (i) borrow systematically to fund budget imbalances, debt repayments and other net financing needs; (ii) undertake major fiscal adjustments, which may be socially or politically unfeasible or unduly painful; and (iii) restructure

¹⁸ An adequate policy framework includes policies currently pursued by the government and new reforms and initiatives that may be realistically adopted.

obligations owed to its financiers, thus unilaterally imposing a debt-service moratorium or outright default.¹⁹

Public debt is unsustainable when the government debtor is not solvent and/or not liquid. Public debt is deemed unsustainable when the government cannot (and/or is unwilling to) service the financial liabilities that are due within the current policy framework and economic outlook, because both elements are not conducive to generating sufficient own resources now or later for the government to honor the obligations owed to its financiers. Since the government lacks adequate repayment capacity going forward, the recurrent borrowing required in future years to (hypothetically) fund persistent financial gaps would lead to risky dynamics for the public debt. The public debt stock, for example, could rise to a level too high or grow at a pace too fast, or the annual flow of indebtedness could be too large for the market to absorb.²⁰ An unsustainable public debt also results when the government cannot (and/or is unwilling to) service financial liabilities because it cannot access borrowed funds to roll over debts maturing soon.

Unsustainable public debt characterized by excessive borrowing and rapid accumulation of financial obligations will likely result in a severe fiscal (budget) adjustment or an outright default. A persistent borrowing spree may lead to a high level of public debt in a short period. A heavy sovereign debt burden often has adverse consequences for public finances and the country-wide economy: e.g., a narrower budget space because of larger interest payments, higher credit risk and interest rates, deteriorating credit ratings on sovereign bonds and securities, crowding out of private borrowing and spending.

In such challenging circumstances, the government may decide to undertake a major budgetary adjustment to slow the pace of borrowing or cut it altogether. The government may decide to declare a default and stop servicing maturing debt. In parallel, financiers who observe the explosive debt dynamics and the deterioration of economic and public-finance conditions may decide to act. They may require higher interest and coupon rates to be compensated for mounting credit risk. Alternatively, they may reduce the flow of net financing to the government to narrow their credit risk exposure or even decrease the stock holdings of financial claims against the government to reduce the exposure further. In this context, facing no access to borrowed funds at reasonable costs to balance out receipts and payments, the government would have no option but to carry out a fiscal adjustment, declare a default or both.

¹⁹ Corrections in fiscal and financing policies may be necessary to strengthen the government's capacity to generate own resources or reduce expenditures and other financing needs. What matters for debt sustainability is whether such corrections are realistic or not given political, economic and social constraints. Even a solvent government is not expected to mechanically maintain its current policies unchanged under all circumstances. On the contrary, policy adjustments may be adequate in response to cyclical fluctuations or adverse shocks, without undermining solvency in the long term. Policy responses could help maintain solvency, e.g., an adverse shock could cause long-term growth potential to deteriorate. The government could mitigate such deterioration by running a temporary, well-designed fiscal stimulus financed with borrowed funds.

²⁰ A scheme where a debtor systematically issues new debts to pay interests and amortizes old debts is known as a Ponzi game and often characterizes the behavior of an insolvent debtor. New borrowings may be necessary and convenient in the short to medium term, but they cannot be the only and recurrent source of funds to service financial obligations.

1.2.4. Assessing public debt sustainability: basic notions and public debt ratios

An assessment of public debt sustainability is a forward-looking analysis and involves expert judgment. The assessment is meant to conclude whether or not the government is expected to be able (and willing) to service its financial liabilities in a multiyear horizon. The assessment then evaluates whether prospective economic conditions and the policy framework are conducive to ensuring the government's repayment capacity in the medium to long term (solvency) and borrowing capacity in the short to medium term (liquidity). The assessment is a forward-looking analysis that involves forecasts, scenarios, uncertainties and risks, as discussed in the next section. Evaluating future, uncertain circumstances shaping the country's economy and the government's public finances requires expert judgment, including understanding policymaking and market dynamics.

In practice, assessing debt sustainability relies on analytical frameworks, subjective opinions, interpretations of events and prevailing views among market participants. Public debt dynamics is a widely used analytical framework for assessing debt sustainability. The framework identifies the drivers of the government's financial obligations, including economic performance and public policies, which are determinants of solvency and liquidity. It is consistent with the government's flow of funds—as shown in the preceding section.

Sustainability assessments often rely on public debt ratios that combine measures of the government's financial obligations, repayment capacity and borrowing capacity. Public debt ratios are widely utilized to assess sustainability as they are easily computed with (i) measures of financial obligations in the numerator and (ii) measures of repayment or borrowing capacity in the denominator. Intuitively, although loosely, one can see a public debt ratio as the relationship between how much money the government owes (numerator) and how much money the government can make (denominator) by collecting own funds or accessing borrowed funds, which can be allocated to debt repayments.

The government's financial obligations placed in the numerator of a public debt ratio may refer to the total liabilities due over a projected period, e.g., the debt stock measured at face value or the present value of all future debt-service obligations due until maturity (discounted using a certain discount rate). Alternatively, the financial obligations may capture only annual payments due in the short term, e.g., debt-service payments falling due next year, measured at face value. The denominator of a public debt ratio may refer to the government's repayment capacity measured directly or through proxy (correlated) variables, e.g., budget revenues, GDP, national income or exports. The ratios may also capture measures of the government's borrowing capacity, e.g., GDP, national savings or the size of the financial market's flow of potential financing to the public sector. The public debt ratios relate to either solvency or liquidity depending on the chosen variables.²¹ An analysis of the public debt-to-GDP ratio—arguably the most widely used debt indicator—is presented later in this section.

²¹ In practice, liquidity indicators can also measure the size of a government's gross financing needs (GFN) *relative* to GDP, revenues or measures of creditors' demand for public debt (e.g., flow of banking credit to the government).

The dynamics of public debt ratios tracks the evolution of the government's public debt relative to repayment or borrowing capacity. Changes in a public debt ratio—say, over one year or throughout a multiyear horizon—reflect the joint evolution of the government's public debt (placed in the numerator of the ratio) and repayment (or borrowing) capacity (in the denominator). The public debt ratio provides a practical way to see whether the balance between financial obligations and repayment (or borrowing) capacity is preserved, improves or deteriorates. For instance, if the accumulation of government's obligations proceeds faster than the expansion of repayment (or borrowing) capacity, then debt-sustainability conditions would deteriorate and result in a rising public debt ratio. But if repayment (or borrowing) capacity grows faster than the buildup of public debt, then debt-sustainability conditions would improve and result in a decreasing public debt ratio. Hence, the dynamics of a public debt ratio provide a practical device to assess sustainability.²²

Example #5

The case of Macroland illustrates the calculation of two widely used public debt ratios: debt-to-GDP and debt service-to-revenue. Table 1.5 contains the key information concerning economic and policy variables required to calculate the two ratios, referencing a two-year historical period (2020-2021) and a five-year projection horizon (2022-2026). Macroland's economic and policy variables presented in Table 1.5 are used hereafter for many other examples. All the information builds up the baseline scenario, which reflects the most likely outlook concerning economic performance and public policies in the foreseeable future. This scenario provides the central reference point for analyzing public debt sustainability, as discussed in the next section.

The economic variables are the following: GDP at current prices (often called “nominal GDP”), the growth rate of GDP at constant prices (“real GDP”) and the inflation rate measured by the GDP deflator; the exchange rates between local and foreign currencies (introduced in Table 1.2); and the interest rates on government debt denominated in both currencies. The policy variables include fiscal and financing variables (Table 1.1), with a disaggregation of government spending between interest payments and primary expenditure (i.e., excluding interests); the breakdown of public debt stock, issuances and repayments by the two currencies (introduced in Table 1.2); and the recognition of contingent liabilities.

Table 1.2 shows how to calculate the end-of-year public debt stock from 2020 to 2022, using the two approaches to public debt dynamics indicated in equations (3) and (4). Extending the same calculations to 2023-2026 is straightforward and includes valuation effects and contingent liabilities. As shown in Table 1.5, the government debt is expected to increase from MA\$130 million at the end of 2021 to MA\$148 million by the end of 2026. Debt-service obligations, comprising amortization and interest payments, are anticipated to rise from MA\$16.1 million to MA\$16.8 million in the same period.

²² A public debt ratio may increase or decrease over time because of combinations of changes in the numerator and denominator, upward or downward. For ease of exposition, the text focuses on cases where both components of a ratio grow although at different speeds. Cases where both components decrease or change in opposite directions are feasible and do not alter the main argument.

The public debt-to-GDP and the debt service-to-revenue ratios (Figure 1.1) are calculated using the nominal GDP and revenues forecasts—presented in Table 1.1. Macroland’s public debt increased from 40% of GDP to 47.3% from 2020 to 2021. It is projected to stabilize at about 37% of GDP in the medium term. The balance between financial obligations and repayment (or borrowing) capacity will be preserved in the next few years, with the public debt ratio staying at a level likely to be sustainable (more will be said about sustainability in the rest of the chapter).

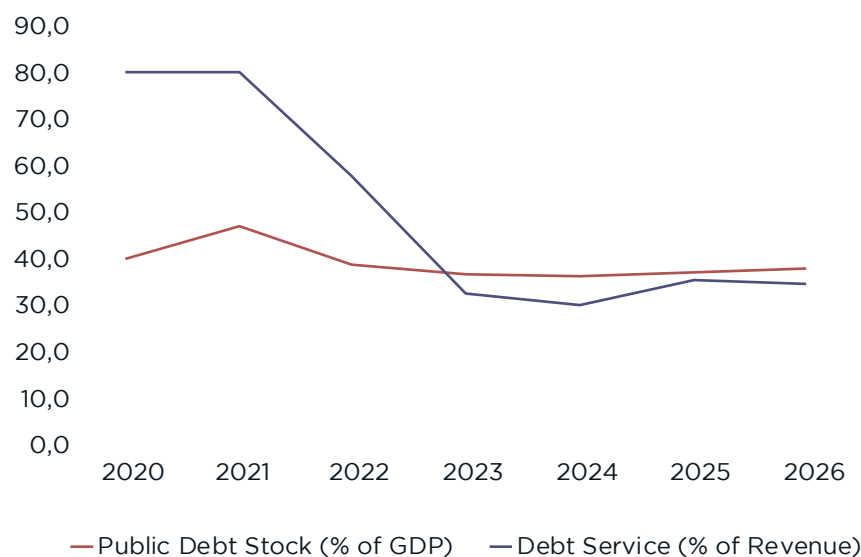
Table 1.5. Macroland Government’s Debt Dynamics—Baseline Scenario

	2020 (hist.)	2021 (hist.)	2022 (for.)	2023 (for.)	2024 (for.)	2025 (for.)	2026 (for.)
GDP							
GDP at Current Prices (MA\$ million)	250,0	275,0	300,3	324,8	347,9	369,1	391,6
GDP at Current Prices (% annual growth)	9,2	10,0	9,2	8,2	7,1	6,1	6,1
GDP at Constant Prices (% annual growth)	3,0	0,0	4,0	4,0	4,0	3,0	3,0
GDP Deflator (% annual growth)	6,0	10,0	5,0	4,0	3,0	3,0	3,0
Exchange Rates							
Exchange Rate at end-of-year (MA\$ per US\$)	2,0	3,0	2,5	2,5	2,7	2,8	2,9
Exchange Rate average-during-year (MA\$ per US\$)	2,0	2,5	2,7	2,5	2,6	2,8	2,9
Interest Rates on Public Debt							
Avg. Interest Rate on MA\$-denom. Debt (%)	4,0	4,0	4,5	4,5	4,0	4,0	4,0
Avg. Interest Rate on US\$-denom. Debt (%)	2,0	2,0	2,0	2,0	2,0	2,0	2,0
Fiscal & Financing Indicators (MA\$ million, unless specified)							
Revenues	25,0	20,0	40,0	40,0	42,8	45,5	48,2
Expenditures	28,0	30,0	25,0	39,0	41,3	43,7	46,4
Primary Expenditures	22,0	26,5	20,4	35,0	37,5	39,8	42,2
Interest Payments	6,0	3,6	4,6	4,0	3,8	3,9	4,2
Interest on MA\$-denom. Debt	3,5	2,8	3,8	3,0	2,7	2,7	2,9
Interest on US\$-denom. Debt	2,5	0,8	0,8	1,0	1,1	1,2	1,3
Overall Fiscal Balance	-3,0	-10,0	15,0	1,0	1,6	1,8	1,8
Primary Fiscal Balance	3,0	-6,5	19,6	5,0	5,4	5,7	6,0
Financing Needs	10,0	10,0	10,0	10,8	11,6	12,3	13,0
Financing Sources	5,0	5,0	0,0	7,0	7,5	8,0	8,4
Other Net Financing Needs	5,0	5,0	10,0	3,8	4,1	4,3	4,6
Debt Issuances (Gross Borrowings)	22,0	27,5	13,5	11,8	11,7	14,8	15,3
MA\$-denom. Debt Issuance (MA\$ million)	12,0	15,0	0,0	4,3	3,9	3,8	3,9
US\$-denom. Debt Issuance (US\$ million)	5,0	5,0	5,0	3,0	3,0	4,0	4,0
Debt Repayments (Amortizations)	14,0	12,5	18,5	9,0	9,2	12,3	12,6
MA\$-denom. Debt Repaym. (MA\$ million)	14,0	0,0	18,5	4,0	4,0	4,0	4,0
US\$-denom. Debt Repaym. (US\$ million)	0,0	5,0	0,0	2,0	2,0	3,0	3,0

	2020 (hist.)	2021 (hist.)	2022 (for.)	2023 (for.)	2024 (for.)	2025 (for.)	2026 (for.)
Contingent Liabilities (MA\$ million, <i>unless specified</i>)							
Recognition of Contingent Liabilities	0,0	0,0	0,0	0,0	0,0	6,0	6,0
MA\$-denom. Contingent Liabilities (MA\$ million)	0,0	0,0	0,0	0,0	0,0	6,0	6,0
US\$-denom. Contingent Liabilities (US\$ million)	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Valuation Effects (MA\$ million)							
Valuation Effects		15,0	-8,5	0,0	4,3	2,2	2,4
V. E. on Initial US\$-denom. Debt Stock		15,0	-7,5	0,0	4,2	2,2	2,3
V. E. on Net Issuance of US\$-denom. Debt Flow		0,0	-1,0	0,0	0,1	0,0	0,1
Public Debt Indicators (MA\$ million, <i>unless specified</i>)							
Public Debt Stock at end-of-year (MA\$ million)	100,0	130,0	116,5	119,3	126,1	136,9	148,0
MA\$-denom. Debt Stock (MA\$ million)	70,0	85,0	66,5	66,8	66,7	72,5	78,4
US\$-denom. Debt Stock (US\$ million)	15,0	15,0	20,0	21,0	22,0	23,0	24,0
Annual Variation in Debt Stock (MA\$ million)		30,0	-13,5	2,8	6,8	10,8	11,1
Debt Manager's Approach (MA\$ million)		30,0	-13,5	2,8	6,8	10,8	11,1
Fiscal Policy Maker's Approach (MA\$ million)		30,0	-13,5	2,8	6,8	10,8	11,1
Public Debt Stock (% of GDP)	40,0	47,3	38,8	36,7	36,2	37,1	37,8
Debt Service (% of Revenue)	80,0	80,3	57,8	32,5	30,3	35,5	34,8

avge. = average, denom. = denominated, for. = forecast, hist. = historical, GDP = gross domestic product, repaym. = repayment, V. E. = valuation effect.
Source: Author.

Figure 1.1. Macroland Government's Debt Indicators—Baseline Scenario



GDP = gross domestic product.
Source: Author.

1.2.5. Government's intertemporal budget constraint: analytical considerations on solvency and liquidity

Public debt dynamics offers insights into the notions of solvency and liquidity. We noted that debt repayments in a single year can be funded with borrowed funds or own resources. Equation (11) illustrates the two policy options in the context of the government's flow of funds. We indicated that solvency and liquidity refer to repayment and borrowing capacity over a multiyear horizon in the medium to long term for solvency and in the short to medium term for liquidity. We now explore how public debt dynamics can help understand the two notions and introduce an important concept for analyzing public debt: the government's intertemporal budget constraint.

Looking backward, public debt dynamics tracks how and why the government's financial liabilities originated. The public debt stock outstanding in the present year is primarily determined by the cumulative result of budget deficits and other net financing needs incurred in previous years.²³ As these financial gaps were financed with borrowed funds obtained through debt issuances, the accumulation of financial liabilities eventually built up the public debt stock outstanding in the current year. Formally expressing how the public debt stock in the current year relates to financial gaps in past years is straightforward. Consider equation (2) introduced in the analysis of public debt dynamics for years t , $t-1$, etc., back until year 1:

For year t

$$Debt_t = Debt_{(t-1)} + Overall\ Fiscal\ Deficit_t + Other\ Net\ Financing\ Needs_t$$

For year $t-1$

$$Debt_{(t-1)} = Debt_{t-2} + Overall\ Fiscal\ Deficit_{t-1} + Other\ Net\ Financing\ Needs_{(t-1)}$$

And so on, while for year 1

$$Debt_1 = Debt_0 + Overall\ Fiscal\ Deficit_1 + Other\ Net\ Financing\ Needs_1$$

By applying a recursive substitution going backward to all the equations above, we obtain equation (12), which indicates how the public debt stock in the current year (left-hand side) relates to the cumulative financial gaps in past years (right-hand side):

$$(12) Debt_t = Debt_0 + \sum_{j=1}^t (Overall\ Fiscal\ Deficit_j + Other\ Net\ Financing\ Needs_j)$$

where public debt stocks are measured at the end of year t , $t-1$, etc., while overall fiscal deficit and other net financing needs are measured during year t , $t-1$, etc.

23 The analysis presented here excludes contingent liabilities and valuation effects for ease of exposition. Their inclusion does not change the thrust of the argument but complicates the algebraic manipulations involved. The analysis references budget deficits and other net financing needs—as opposed to budget surpluses and surpluses of financing sources over needs—because such circumstances are intuitively easier to relate to borrowings and debt accumulation. Allowing for the opposite circumstances (i.e., surpluses) does not change the thrust of the argument either.

Looking forward, the public debt dynamics tracks how financial liabilities can be repaid in future years, as formally expressed by the government's intertemporal budget constraint. The public debt stock outstanding in the present year can be repaid either with (i) budget surpluses and other net financing sources that could be generated in the distant future or (ii) borrowed funds (i.e., debt rollovers) that could be accessed in the immediate future. The government's intertemporal budget constraint stresses how the public debt stock in the current year relates to financial surpluses in future years. To derive it, a few formal steps are necessary. Let us start by considering a rearrangement of the fiscal policymaker's perspective on the public debt dynamics presented in equation (2):

$$Debt_t = Debt_{t-1} - Overall\ Fiscal\ Surplus_t - Other\ Net\ Financing\ Sources_t$$

Consider the equation above for years $t+1$, $t+2$, etc., ahead until future year T :

For year $t+1$

$$Debt_{t+1} = Debt_t + Overall\ Fiscal\ Surplus_{t+1} + Other\ Net\ Financing\ Sources_{t+1}$$

For year $t+2$

$$Debt_{t+2} = Debt_{t+1} + Overall\ Fiscal\ Surplus_{t+2} + Other\ Net\ Financing\ Sources_{t+2}$$

And so on, while for year T

$$Debt_T = Debt_{T-1} + Overall\ Fiscal\ Surplus_T + Other\ Net\ Financing\ Sources_T$$

By applying a recursive substitution to all the equations above, we obtain the following:

$$(13) \quad Debt_t = Debt_T + \sum_{j=t+1}^T (Overall\ Fiscal\ Surplus_j + Other\ Net\ Financing\ Sources_j)$$

where public debt stocks are measured at the end of years t and T , while overall fiscal surplus and other net financing sources are measured during years $t+1$, $t+2$, etc., until T .

Assuming the government manages to generate own resources over several years to fully repay the public debt outstanding in the current year ($Debt_t$) and all the flows of new financial liabilities created in years $t+1$, $t+2$, etc., until year T (whenever borrowed funds are used to roll over maturing obligations or cover fiscal deficits), then the public debt outstanding in year T ($Debt_T$) will be zero. Intuitively, the government will have no "residual" $Debt_T$ if all obligations are eventually paid back to the financiers. Assuming the multiyear horizon is extended to infinity, then year T represents the distant future. We eventually obtain equation (14), known as the government's intertemporal budget constraint:

$$(14) \quad Debt_t = \sum_{j=t+1}^{T \rightarrow \infty} (Overall\ Fiscal\ Surplus_j + Other\ Net\ Financing\ Sources_j)$$

where public debt stock is measured at the end of year t , while overall fiscal surplus and other net financing sources are measured during years $t+1, t+2$, etc., until T .

The government's intertemporal budget constraint in equation (14) indicates how the public debt stock in the current year (left-hand side) relates to the (expected) cumulative financial surpluses in future years (right-hand side). This constraint formally expresses the notions of solvency and liquidity by showing how the public debt stock in the current year is to be repaid with own resources expected in the future, which is the repayment capacity associated with solvency. The analytical derivation of the intertemporal budget constraint expects borrowed funds to be available (if required) in the future to ensure a balance between receipts and payments, which is the borrowing capacity associated with liquidity.

The intertemporal budget constraint reflects the balance between all the expected future receipts and payments of a solvent and liquid government during a multiyear horizon. This constraint is expected to be fulfilled by a solvent and liquid government, as opposed to the flow of funds, which is an accounting identity that must be fulfilled by any government, even if insolvent or illiquid. When implementing the intertemporal budget constraint in practice, the budget and financing variables corresponding to future years are forecasts (projections) made by an analyst. These forecasts may materialize (or not) depending on the prospective economic outlook and policy framework, as discussed in the next section.

1.2.6. Further analytical considerations on the government's intertemporal budget constraint

The government's intertemporal budget constraint is often expressed in terms of the present value of all future primary fiscal surpluses and other net financing sources (discounted using the average interest rate on all financial liabilities). A few formal steps are necessary to derive this formulation.

The overall fiscal surplus is broken down into the primary fiscal surplus (which excludes the interest payments from total expenditures) and the interest payments (footnote 3):

$$(15) \text{Debt}_t - \text{Debt}_{t-1} = \text{Interest Payments}_t - (\text{Primary Fiscal Surplus}_t + \text{Other Net Financing Sources}_t)$$

where public debt stock is measured at the end of year t , while interest payments, primary fiscal surplus and other net financing sources are measured during year t .

Interest payments are broken down into the inherited stock of public debt and the average interest rate on all financial liabilities:

$$(16) \text{Debt}_t - \text{Debt}_{t-1} = i_t * \text{Debt}_{t-1} - (\text{Primary Fiscal Surplus}_t + \text{Other Net Financing Sources}_t)$$

where public debt stock is measured at the end of year t , i_t is the average interest rate and primary fiscal surplus and other net financing sources are measured during year t .

Rearranging terms, we obtain the following:

$$(17) \text{Debt}_t = (1+i_t) * \text{Debt}_{t-1} - (\text{Primary Fiscal Surplus}_t + \text{Other Net Financing Sources}_t)$$

where public debt stock is measured at the end of year t , i_t is the average interest rate and primary fiscal surplus and other net financing sources are measured during year t .

Consider equation (17) for years $t+1$, $t+2$, etc., ahead until future year T :

For year $t+1$

$$(1+i_{t+1}) * \text{Debt}_t = \text{Debt}_{t+1} + \text{Primary Fiscal Surplus}_{t+1} + \text{Other Net Financing Sources}_{t+1}$$

For year $t+2$

$$(1+i_{t+2}) * \text{Debt}_{t+1} = \text{Debt}_{t+2} + \text{Primary Fiscal Surplus}_{t+2} + \text{Other Net Financing Sources}_{t+2}$$

And so on, while for year T

$$(1+i_T) * \text{Debt}_{T-1} = \text{Debt}_T + \text{Primary Fiscal Surplus}_T + \text{Other Net Financing Sources}_T$$

By applying a recursive substitution going forward to all the equations above, we obtain the following:

$$(18) \text{Debt}_t = \frac{\text{Debt}_T}{\prod_{k=t+1}^T (1+i_k)} + \sum_{j=t+1}^T \frac{(\text{Primary Fiscal Surplus}_j + \text{Other Net Financing Sources}_j)}{\prod_{k=t+1}^j (1+i_k)}$$

Where public debt stocks are measured at the end of year t and T ; primary fiscal surplus and other net financing sources are measured during year $t+1$, $t+2$, etc., until T ; and i_k is the average interest rate for year $t+1$, $t+2$, etc., until T .

Assuming that the government manages to generate own resources over several years to fully repay the public debt outstanding in the current year (Debt_t) and all the flows of new financial liabilities created in years $t+1$, $t+2$, etc., until year T , then the public debt outstanding in year T (Debt_T) will be zero. We consider an *infinite* horizon. Thus, we obtain equation (19), which is an alternative formulation for the government's intertemporal budget constraint, showing how the public debt stock in the current year (left-hand side) relates to the present value of all (expected) primary fiscal surpluses and other net financial sources in future years (right-hand side):

$$(19) \text{Debt}_t = \sum_{j=t+1}^{T \rightarrow \infty} \frac{(\text{Primary Fiscal Surplus}_j + \text{Other Net Financing Sources}_j)}{\prod_{k=t+1}^j (1+i_k)}$$

where public debt stock is measured at the end of year t ; primary fiscal surplus and other net financing sources are measured during year $t+1$, $t+2$, etc., until T ; and i_k is the average interest rate for year $t+1$, $t+2$, etc., until T .²⁴

1.2.7. Public debt-to-GDP ratio: Analytical formulation and drivers

The ratio between the public debt stock and GDP is the most popular of the public debt ratios. For simplicity, we refer to it as the public debt ratio or the “debt burden.” The numerator is the government’s total financial liabilities outstanding at the end of the year, while the denominator is the economy-wide GDP that year. GDP is an indicator of economic output and income, often correlated with the government’s domestic revenues and financing sources. GDP is measured at current prices, i.e., “nominal GDP,” as distinct from “real GDP,” which is measured at constant prices of a base year.

A moderate and nonexplosive path for the public debt-to-GDP ratio typically signals sustainable debt. For a government to be considered solvent and liquid, the evolution of its financial obligations, repayment and borrowing capacity should broadly be in line. Nonexplosive dynamics of the public debt-to-GDP ratio reflect such a harmonious evolution and are associated with a creditworthy government.

The dynamics of the public debt-to-GDP ratio track the evolution of the government’s public debt relative to GDP growth. Changes in the public debt ratio result from variations in the government’s public debt and the economy-wide GDP. Equation (20) computes the annual variation in the public debt ratio (left-hand side) as the difference between (i) the annual variation in the public debt stock (expressed as a share of GDP on the right-hand side’s first term) and (ii) the annual variation in nominal GDP (embedded in the growth rates found in the right-hand side’s second term):

$$(20) \frac{Debt_t}{GDP_t} - \frac{Debt_{t-1}}{GDP_{t-1}} = \left(\frac{Debt_t - Debt_{t-1}}{GDP_{t-1}} \right) - \left(\frac{GRGDP_t}{1+GRGDP_t} * \frac{Debt_{t-1}}{GDP_{t-1}} \right)$$

where the public debt ratios (denoted $Debt/GDP$) are measured for years t and $t-1$, and the growth rate of nominal GDP (denoted $GRGDP_t$) refers to year t .

The dynamics of the public debt-to-GDP ratio in equation (20) is a simple extension of the public debt dynamics presented in the previous section. The first driver of the evolution of the public debt ratio is the annual variation of the public debt stock ($Debt_t - Debt_{t-1}$) found in the right-hand side’s first term, computed with equations (3) and (4). This annual variation is now expressed as a share of GDP, as distinct from monetary terms. The second driver of the dynamics of the public

24 When using present values with an infinite time horizon, it is not necessary to assume that the public debt outstanding in a distant year T ($Debt_T$) be zero. It is sufficient, instead, that the cumulative annual growth rate of the public debt stock (computed over an infinite horizon) be smaller than the cumulative annual average interest rate (computed over the same infinite horizon). This is known as the transversality condition, formally as follows:

$$\lim_{T \rightarrow \infty} \frac{Debt_T}{\prod_{k=t+1}^T (1+i_k)} \rightarrow 0 \text{ or equivalently, } \lim_{T \rightarrow \infty} Debt_t * \prod_{k=t+1}^T \left(\frac{1+GRDebt_k}{1+i_k} \right) \rightarrow 0$$

where $GRDebt_k$ is the annual growth rate of public debt stock and i_k is the average interest rate for year $t+1$, $t+2$, etc.

debt ratio is the growth of nominal GDP found in the right-hand side's second term, which results from economic growth and inflation.^{25, 26}

Economic performance and public policies drive the dynamics of the public debt ratio. From the fiscal policymaker's perspective, the public debt ratio brings together two elements: (i) the government's budget imbalances and financing transactions underpinning the accumulation of public debt and (ii) the repayment (or borrowing) capacity of the government. Both elements are driven by economic performance and public policies, as equation (21) formally expresses:

$$(21) \frac{Debt_t}{GDP_t} - \frac{Debt_{t-1}}{GDP_{t-1}} = \left(\frac{Overall\ Fiscal\ Deficit_t}{GDP_t} + \frac{Other\ Net\ Financing\ Needs_t}{GDP_t} + \frac{Recong.\ of\ Cont.\ Liab_t}{GDP_t} + \frac{Val.\ Effects_t}{GDP_t} \right) - \left(\frac{GRGDP_t}{1+GRGDP_t} * \frac{Debt_{t-1}}{GDP_{t-1}} \right)$$

where the public debt ratios (denoted $Debt/GDP$) are measured for years t and $t-1$; the growth rate of nominal GDP (denoted $GRGDP_t$) refers to year t ; and overall fiscal deficit, other net financing needs, the recognition of contingent liabilities and the valuation effects are measured as a share of GDP during year t .

Equation (21) explicitly relates the annual variation in the public debt ratio to: (i) the government's policies reflected in the fiscal balance, financing transactions, contingent liabilities, currency of denomination of public debt and valuation effects; and (ii) the country's economic performance in terms of growth, inflation, exchange rates, interest rates, etc. This formal expression quantifies the contributions of these factors to the dynamics of the public debt ratio, an analysis dubbed the public debt dynamics decomposition.

Example #6

The example of Macroland can be used to analyze the dynamics of the public debt-to-GDP ratio presented in equation (20) and the public debt dynamics decomposition formulated in equation (21). Table 1.6 contains key information concerning economic and policy variables already presented in Table 1.5, although many are measured as a share of GDP, a common practice in the analysis of public debt sustainability.

Table 1.2 shows how to calculate the public debt stock using equations (3) and (4). Table 1.5 indicates how to compute the public debt ratio by mechanically combining the public debt stock in the numerator and nominal GDP in the denominator.

Table 1.6 utilizes equation (20) to project the public debt ratio directly and to quantify the contributions from annual changes in the public debt stock and nominal GDP. For instance, from 2021 to 2022, the public debt ratio is expected to decline

25 The growth rate of nominal GDP (GRGDP) can be broken down into the growth rate of real GDP (GRgdp, which measures economic growth) and the growth rate of the GDP deflator (GRdefl, which measures overall price inflation, and is computed as the ratio between nominal GDP and real GDP): $(1+GRGDP_t) = (1+GRgdp_t) * (1+GRdefl_t)$

26 Intuitively, what is the first term about? It is the change in the numerator of the public debt ratio. The first term measures how an increase in the public debt stock pushes the public debt ratio up or, instead, how a reduction in the public debt stock pushes the public debt ratio down. The first term is simply the change in the public debt stock expressed as a share of GDP. What is the second term about? It is the change in the denominator of the public debt ratio. The second term has a negative sign and thus quantifies how an increase in nominal GDP pushes the public debt ratio down or, instead, how a reduction in nominal GDP pushes the public debt ratio up.

from 43.7% of GDP to 38.8%, i.e., an annual variation of -8.5 percentage points (p.p.), as shown in the section Public Debt Ratio—Annual Variation and Contributions (I). The projected reduction in the public debt ratio is explained by lower debt and higher nominal GDP, which contribute with -4.5 p.p. and -4 p.p., respectively, according to the public debt dynamic decomposition. A similar analysis can be undertaken yearly in the projection horizon (2022-2026).

Table 1.6 also considers equation (21) to measure contributions from economic and policy variables and thus improves the analysis of public debt dynamics (see section Public Debt Ratio—Annual Variation & Contributions (II)). For instance, the projected annual variation of -8.5 p.p. in the public debt ratio from 2021 to 2022 can be broken down into contributions of the fiscal surplus (-5 p.p.), other net financing needs (3.3 p.p.), valuation effects (-2.8 p.p.) and nominal GDP growth (-4 p.p.). Only funding other net financing needs pushes the public debt ratio upward. In contrast, the ratio is driven downward by the budget surplus, the appreciation of the local currency and a higher nominal GDP. The analysis can be carried forward from 2022 to 2026 as well.

A widely used visualization of public debt dynamic decomposition is in Figure 1.2. White squares represent the annual variation in the public debt ratio and the contributions from economic and policy factors are displayed in the colored bars.

Table 1.6. Macroland Government's Debt Dynamics Decomposition—Baseline Scenario

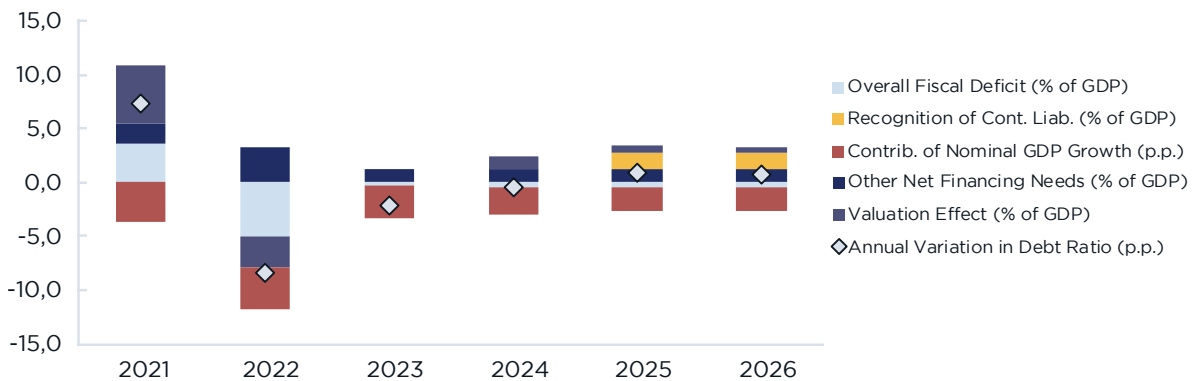
	2020 (hist.)	2021 (hist.)	2022 (for.)	2023 (for.)	2024 (for.)	2025 (for.)	2026 (for.)
Public Debt Ratio: Level							
Public Debt Ratio (Debt Stock as % of GDP)	40,0	47,3	38,8	36,7	36,2	37,1	37,8
Public Debt Ratio: Annual Variation & Contributions (I)							
Annual Variation in Public Debt Ratio (p.p.)		7,3	-8,5	-2,1	-0,5	0,8	0,7
of which:							
Annual Variation in Debt Stock (% of GDP)		10,9	-4,5	0,9	2,0	2,9	2,8
Contribution of Nominal GDP Growth (p.p.)		-3,6	-4,0	-2,9	-2,4	-2,1	-2,1
Public Debt Ratio: Annual Variation & Contributions (II)							
Annual Variation in Public Debt Ratio (p.p.)		7,3	-8,5	-2,1	-0,5	0,8	0,7
of which:							
Overall Fiscal Deficit (% of GDP)		3,6	-5,0	-0,3	-0,5	-0,5	-0,5
Other Net Financing Needs (% of GDP)		1,8	3,3	1,2	1,2	1,2	1,2
Recognition of Contingent Liabilities (% of GDP)		0,0	0,0	0,0	0,0	1,6	1,5
Valuation Effect (% of GDP)		5,5	-2,8	0,0	1,2	0,6	0,6
Contribution of Nominal GDP Growth (p.p.)		-3,6	-4,0	-2,9	-2,4	-2,1	-2,1
of which:							
Contrib. of Real GDP Growth (p.p.)		0,0	-1,7	-1,4	-1,4	-1,0	-1,0
Contrib. of GDP Deflator Inflation (p.p.)		-3,6	-2,3	-1,5	-1,1	-1,1	-1,1
Public Debt Stock: Level							
Public Debt Stock at end-of-year (MA\$ million)	100,0	130,0	116,5	119,3	126,1	136,9	148,0

	2020 (hist.)	2021 (hist.)	2022 (for.)	2023 (for.)	2024 (for.)	2025 (for.)	2026 (for.)
MA\$-denom. Debt Stock (MA\$ million)	70,0	85,0	66,5	66,8	66,7	72,5	78,4
US\$-denom. Debt Stock (US\$ million)	15,0	15,0	20,0	21,0	22,0	23,0	24,0
Public Debt Stock: Annual Variation & Contributions							
Annual Variation in Debt Stock (MA\$ million) of which:		30,0	-13,5	2,8	6,8	10,8	11,1
Overall Fiscal Deficit (MA\$ million)		10,0	-15,0	-1,0	-1,6	-1,8	-1,8
Other Net Financing Needs (MA\$ million)		5,0	10,0	3,8	4,1	4,3	4,6
Recognition of Contingent Liabilities (MA\$ million)		0,0	0,0	0,0	0,0	6,0	6,0
Valuation Effect (MA\$ million)		15,0	-8,5	0,0	4,3	2,2	2,4
GDP							
GDP at Current Prices (MA\$ million)	250,0	275,0	300,3	324,8	347,9	369,1	391,6
GDP at Current Prices (% annual growth)	9,2	10,0	9,2	8,2	7,1	6,1	6,1
GDP at Constant Prices (% annual growth)	3,0	0,0	4,0	4,0	4,0	3,0	3,0
GDP Deflator (% annual growth)	6,0	10,0	5,0	4,0	3,0	3,0	3,0
Exchange Rates							
Exchange Rate at end-of-year (MA\$ per US\$)	2,0	3,0	2,5	2,5	2,7	2,8	2,9
Exchange Rate average-during-year (MA\$ per US\$)	2,0	2,5	2,7	2,5	2,6	2,8	2,9
Interest Rates on Public Debt							
Avg. Interest Rate on MA\$-denom. Debt (%)	4,0	4,0	4,5	4,5	4,0	4,0	4,0
Avg. Interest Rate on US\$-denom. Debt (%)	2,0	2,0	2,0	2,0	2,0	2,0	2,0
Fiscal & Financing Indicators (% of GDP)							
Revenues	10,0	7,3	13,3	12,3	12,3	12,3	12,3
Expenditures	11,2	10,9	8,3	12,0	11,9	11,8	11,9
Primary Expenditures	8,8	9,6	6,8	10,8	10,8	10,8	10,8
Interest Payments	2,4	1,3	1,5	1,2	1,1	1,1	1,1
Interest on MA\$-denom. Debt	1,4	1,0	1,3	0,9	0,8	0,7	0,7
Interest on US\$-denom. Debt	1,0	0,3	0,3	0,3	0,3	0,3	0,3
Overall Fiscal Balance	-1,2	-3,6	5,0	0,3	0,5	0,5	0,5
Primary Fiscal Balance	1,2	-2,3	6,5	1,5	1,5	1,5	1,5
Financing Needs	4,0	3,6	3,3	3,3	3,3	3,3	3,3
Financing Sources	2,0	1,8	0,0	2,2	2,2	2,2	2,2
Other Net Financing Needs	2,0	1,8	3,3	1,2	1,2	1,2	1,2
Debt Issuances (Gross Borrowings)	8,8	10,0	4,5	3,6	3,4	4,0	3,9
MA\$-denom. Debt Issuance	4,8	5,5	0,0	1,3	1,1	1,0	1,0
US\$-denom. Debt Issuance	4,0	4,5	4,5	2,3	2,2	3,0	2,9
Debt Repayments (Amortizations)	5,6	4,5	6,2	2,8	2,6	3,3	3,2
MA\$-denom. Debt Repaym.	5,6	0,0	6,2	1,2	1,1	1,1	1,0
US\$-denom. Debt Repaym.	0,0	4,5	0,0	1,5	1,5	2,2	2,2
Contingent Liabilities (% of GDP)							

	2020 (hist.)	2021 (hist.)	2022 (for.)	2023 (for.)	2024 (for.)	2025 (for.)	2026 (for.)
Recognition of Contingent Liabilities	0,0	0,0	0,0	0,0	0,0	1,6	1,5
MA\$-denom. Contingent Liabilities	0,0	0,0	0,0	0,0	0,0	1,6	1,5
US\$-denom. Contingent Liabilities	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Valuation Effects (% of GDP)							
Valuation Effects		5,5	-2,8	0,0	1,2	0,6	0,6
V. E. on Initial US\$-denom. Debt Stock		5,5	-2,5	0,0	1,2	0,6	0,6
V. E. on Net Issuance of US\$-denom. Debt Flow		0,0	-0,3	0,0	0,0	0,0	0,0

avge. = average, contrib. = contribution, denom. = denominated, for. = forecast, GDP = gross domestic product, hist. = historical, p.p. = percentage point, V.E. = valuation effect.
Source: Author.

Figure 1.2. Macroland Government's Debt Dynamics Decomposition—Baseline Scenario



cont. = contingent, liab. = liability, contrib. = contribution, GDP = gross domestic product, p.p. = percentage point.
Source: Author.

1.2.8. Public debt-to-GDP ratio and interest-growth differential

The dynamics of the public debt ratio can also be expressed in terms of the so-called interest-growth differential and the policy variables discussed above. A few formal steps are required to reformulate equation (21): (i) We break down the overall fiscal deficit into primary fiscal deficit and interest payments, all expressed as a share of GDP; (ii) We break down the interest payments into the past public debt-to-GDP ratio and the average interest rate on all financial liabilities; and (iii) We group all terms that include the past public debt-to-GDP ratio. We obtain equation (22), which is an alternative expression for the evolution of the public debt ratio:

$$(22) \frac{Debt_t}{GDP_t} - \frac{Debt_{t-1}}{GDP_{t-1}} = \left(\frac{i_t - GRGDP_t}{1 + GRGDP_t} \right) * \frac{Debt_{t-1}}{GDP_{t-1}} + \left(\frac{Prim.Fisc.Deficit_t}{GDP_t} + \frac{Other\ Net\ Fin.Needs_t}{GDP_t} + \frac{Recong.of\ Cont.Liab_t}{GDP_t} + \frac{Val.Effects_t}{GDP_t} \right)$$

where the public debt ratios ($Debt/GDP$) are measured for years t and $t-1$; the average interest rate (i_t) and the growth rate of nominal GDP ($GRGDP_t$) refer to year t ; primary fiscal deficit, other net financing needs, the recognition of contingent liabilities and the valuation effects are measured as a share of GDP during year t .

The difference between the average interest rate (i_t) and the growth rate of nominal GDP ($GRGDP_t$) in the right-hand side's first term is the interest-growth differential. It is an important notion in analyzing public debt sustainability because it determines the inertial movement in the public debt ratio if we abstract from the various policies represented by all variables in the right-hand side's second term. Suppose the average interest rate on public debt exceeds the growth rate of nominal GDP. In that case, the public debt ratio has an inertial tendency to rise, i.e., the interest-growth differential is a positive value. On the contrary, the public debt ratio has an inertial tendency to decrease whenever the nominal GDP growth rate exceeds the average interest rate, i.e., the interest-growth differential is a negative value. Fiscal, financing and debt-management policies—driving the dynamics of the public debt ratio—can either reinforce or offset the direction of such inertial public debt dynamics.²⁷

Equation (22) is similar to equation (21) as both relate the dynamics of the public debt ratio to government policies and the country's economic performance. Equation (22) offers an alternative formulation to identify the contributions of these factors to the annual variation in the public debt ratio and thus analyze the public debt dynamics decomposition.

Example #7

The example of Macroland is useful at this stage. Table 1.7 utilizes equation (22) to project the public debt ratio directly and quantify the contributions from economic and policy variables to the public debt dynamics—see section Public Debt Ratio—Annual Variation & Contributions (III).

The public debt ratio is expected to decline from 43.7% of GDP in 2021 to 38.8% in 2022, i.e., an annual variation of -8.5 p.p. The projected change in the debt ratio is broken down into contributions of the primary fiscal surplus (-6.5 p.p.), other net financing needs (3.3 p.p.), valuation effects (-2.8 p.p.) and the interest-growth differential (-2.4 p.p.). Table 1.7 and Figure 1.3 report the yearly public debt dynamic decomposition in the projection horizon (2022-2026).

The contribution from the Interest-growth differential reported in Table 1.7 and Figure 1.3 is given by equation (22) in the right-hand side's first term. The average interest rate on all financial liabilities (i_t) and the growth rate of nominal GDP ($GRGDP_t$) are reported in Memo in Table 1.7. The average interest rate (i_t) is calculated as the ratio between the interest payments made by the government in year t and the stock of public debt outstanding at the end of year $t-1$. This calculation is equivalent to a weighted average of the interest rates on government debt denominated in both currencies—introduced earlier in Table 1.5.

Often, the interest-growth differential is expressed with reference to the average real interest rate and real GDP growth rate. The average real interest rate is the average interest rate (i_t) minus the inflation rate measured by the annual change in the GDP

²⁷ In practice, a negative value for the interest-growth differential may be observed in countries experiencing high economic growth (e.g., during their initial stages of development, or because of booming capital flows or following trade integration to important economic blocs) and low interest rates (e.g., due to high domestic savings rates, or strong investors' preferences to hold government debt or policies aimed at domestic financial repression). In more regular conditions, the interest-growth differential is a positive value.

deflator. It measures the inflation-adjusted cost of borrowing for the government. As the inflation rate is directly subtracted from the average interest rate, the real GDP growth rate replaces the nominal GDP growth rate.

For Macroland, the interest-growth differential is a negative value throughout the projection horizon. The reason is that the growth rate of nominal GDP (GRGDPT) exceeds the average interest rate on all financial liabilities (it) or, in alternative terms, because the real GDP growth rate exceeds the average real interest rate. As the projected economic growth outpaces the inflation-adjusted borrowing costs, there is an inertial tendency for the public debt ratio to decrease over time, reinforced by the anticipated primary surpluses. However, the other net financing needs, the recognition of contingent liabilities and the depreciation of the local currency jointly push the public debt ratio upward and eventually offset the impact of interest-growth differential and primary surpluses.

Table 1.7. Macroland Government's Debt Dynamics Decomposition—Revisited

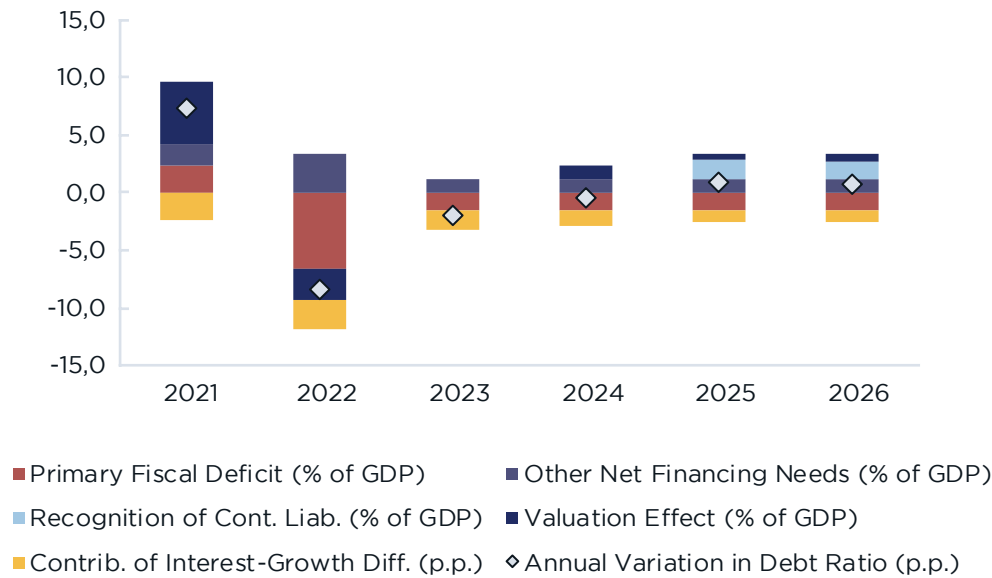
	2020 (hist.)	2021 (hist.)	2022 (for.)	2023 (for.)	2024 (for.)	2025 (for.)	2026 (for.)
Public Debt Ratio: Level							
Public Debt Ratio (Debt Stock as % of GDP)	40,0	47,3	38,8	36,7	36,2	37,1	37,8
Public Debt Ratio: Annual Variation & Contributions (III)							
Annual Variation in Public Debt Ratio (p.p.) of which:		7,3	-8,5	-2,1	-0,5	0,8	0,7
Primary Fiscal Deficit (% of GDP)		2,3	-6,5	-1,5	-1,5	-1,5	-1,5
Other Net Financing Needs (% of GDP)		1,8	3,3	1,2	1,2	1,2	1,2
Recognition of Contingent Liabilities (% of GDP)		0,0	0,0	0,0	0,0	1,6	1,5
Valuation Effect (% of GDP)		5,5	-2,8	0,0	1,2	0,6	0,6
Contribution of Interest-Growth Diff. (p.p.) of which:		-2,3	-2,4	-1,7	-1,4	-1,0	-1,1
Contrib. of Real Interest Rate (p.p.)		-2,3	-0,7	-0,3	0,0	0,0	0,0
Contrib. of Real GDP Growth (p.p.)		0,0	-1,7	-1,4	-1,4	-1,0	-1,0
MEMO							
Interest-Growth Differential (%)		-6,5	-5,6	-4,7	-4,0	-3,0	-3,0
GDP at Current Prices (% annual growth)	9,2	10,0	9,2	8,2	7,1	6,1	6,1
GDP at Constant Prices (% annual growth)	3,0	0,0	4,0	4,0	4,0	3,0	3,0
GDP Deflator (% annual growth)	6,0	10,0	5,0	4,0	3,0	3,0	3,0
Average Interest Rate (%)		3,6	3,6	3,4	3,2	3,1	3,1
Average Real Interest Rate (%)		-5,9	-1,4	-0,6	0,2	0,1	0,1
Interest Payments (MA\$ million)	6,0	3,6	4,6	4,0	3,8	3,9	4,2
Public Debt Stock at end-of-year (MA\$ million)	100,0	130,0	116,5	119,3	126,1	136,9	148,0
Avge. Interest Rate on MA\$-denom. Debt (%)	4,0	4,0	4,5	4,5	4,0	4,0	4,0

	2020 (hist.)	2021 (hist.)	2022 (for.)	2023 (for.)	2024 (for.)	2025 (for.)	2026 (for.)
Avg. Interest Rate on US\$-denom. Debt (%)	2,0	2,0	2,0	2,0	2,0	2,0	2,0

avge. = average, contrib. = contribution, denom. = denominated, diff. = differential, for. = forecast, GDP = gross domestic product, hist. = historical, p.p. = percentage points.

Source: Author.

Figure 1.3. Macroland Government's Debt Dynamics Decomposition—Revisited



cont. = contingent, diff. = differential, liab. = liabilities, contrib. = contribution, GDP = gross domestic product, p.p. = percentage points.

Source: Author.

1.2.9. Public debt-to-GDP ratio and government's intertemporal budget constraint

The government's intertemporal budget constraint can also be expressed using present value and ratios to GDP.²⁸ Equation (23) is analogous to equation (18) but with variables measured as a share of GDP:

$$(23) \frac{Debt_t}{GDP_t} = \frac{Debt_T}{GDP_T} \prod_{k=t+1}^T (1 + i_k - GRGDP_k) + \sum_{j=t+1}^T \left(\frac{Prim.Fisc.Deficit_j}{GDP_j} + \frac{Other\ Net\ Fin.Needs_j}{GDP_j} \right) \prod_{k=t+1}^j (1 + i_k - GRGDP_k)$$

where the public debt-to-GDP ratios are measured at the end of year t and T ; primary fiscal surplus and other net financing sources are measured as a share of GDP during year $t+1$, $t+2$, etc. until T ; and the average interest rate (i_k) and the growth rate of nominal GDP ($GRGDP_k$) refer to year $t+1$, $t+2$, etc. until T .

Assume that the government manages to generate own resources over several years to fully repay existing and future financial liabilities—so the public debt outstanding in year T ($Debt_T$) is zero—and the time is *infinite*. We then obtain equation (24), which is

²⁸ For ease of exposition, the analysis here excludes contingent liabilities and valuation effects.

the government's intertemporal budget constraint expressed in terms of ratios to GDP:

$$(24) \quad \frac{Debt_t}{GDP_t} = \sum_{j=t+1}^{T \rightarrow \infty} \frac{\left(\frac{Prim.Fisc.Deficit_j}{GDP_j} + \frac{Other\ Net\ Fin.Needs_j}{GDP_j} \right)}{\prod_{k=t+1}^T \left(\frac{1+i_k}{1+GRGDP_k} \right)}$$

where the public debt-to-GDP ratio is measured at the end of year t ; primary fiscal surplus and other net financing sources are measured as a share of GDP during year $t+1$, $t+2$, etc. until T ; the average interest rate (i_k) and the growth rate of nominal GDP ($GRGDP_k$) refer to year $t+1$, $t+2$, etc. until T .²⁹

1.2.10. Using public debt ratios in practice

Public debt ratios are comparable across countries. Table 1.8 shows the levels and ratios of general government debt for Bhutan, China and the US in 2020. The size of general government debt in nominal terms (i.e., debt level) is very different in the three countries and cannot be meaningfully compared. Instead, the size of the general government debt relative to GDP (i.e., the public debt ratio) is adequate for an international comparison. Bhutan's debt-to-GDP ratio (121%) is similar to the US's (127%), and both are nearly twice China's (67%). The public debt ratios are more informative and provide a better picture of the balance between financial obligations and repayment (or borrowing) capacity in different countries.

Table 1.8. Public Debt Levels and Ratios

Country	"Public Debt Level in 2020 (US\$ trillion)"	"Public Debt Ratio in 2020 (% of GDP)"
Bhutan	0,003	121
China	10	67
United States	27	127

GDP = gross domestic product.

Source: International Monetary Fund and author.

Public debt ratios are comparable across years, too. Figure 1.4 shows the general government debt ratio for three aggregates of countries for which internationally comparable debt statistics are compiled: the world, advanced economies and emerging economies. The ratios are calculated for various years, from 2005 to 2020. The analysis stresses the significant increase in general government debt (relative to GDP) because of the coronavirus disease (COVID-19) pandemic in 2020. For instance, while the world's public debt was 83% of global GDP before the pandemic in 2019, it rose to 98% during the pandemic in 2020. Such a large jump in the public debt ratio was mainly driven by significant borrowings to fund budget imbalances

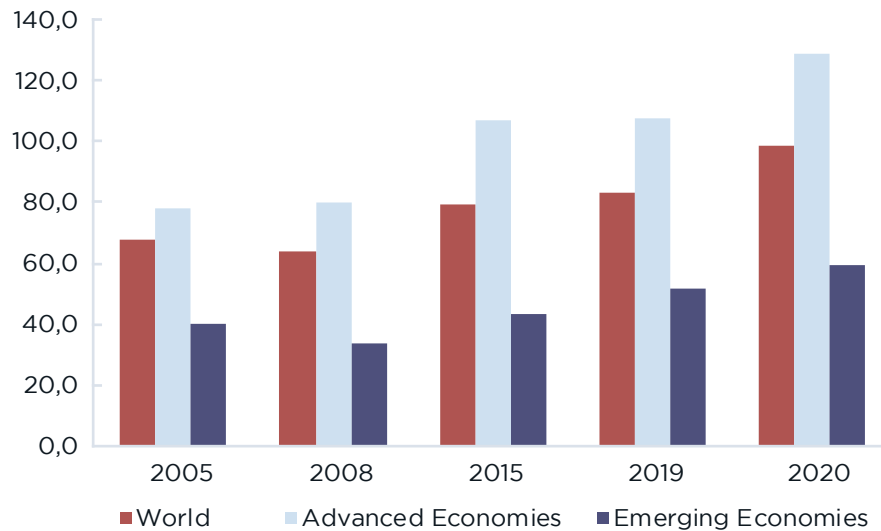
29 It is unnecessary to assume that the public debt outstanding in a distant year T ($Debt_T$) be zero. It is sufficient, instead, that the cumulative annual growth rate of the public debt ratio, computed over an infinite horizon, be smaller than the cumulative difference between annual average interest rate and growth rate of nominal GDP, computed over the same infinite horizon. This is another transversality condition:

$$\lim_{T \rightarrow \infty} \frac{\frac{Debt_T}{GDP_T}}{\prod_{k=t+1}^T \left(\frac{1+i_k}{1+GRGDP_k} \right)} \rightarrow 0 \text{ or equivalently, } \lim_{T \rightarrow \infty} \frac{Debt_T}{GDP_T} * \prod_{k=t+1}^T \left(\frac{1+GRDebtRatio_k}{\left(\frac{1+i_k}{1+GRGDP_k} \right)} \right) \rightarrow 0$$

where $GRDebtRatio_k$ is the annual growth rate of public debt-to-GDP ratio for year $t+1$, $t+2$, etc.

observed in most countries and acute recessions in some countries whose nominal GDP contracted following lockdowns, travel and mobility bans and other health-emergency measures.

Figure 1.4. Public Debt Ratios



Source: International Monetary Fund and author.

1.3. Methodologies for Public Debt Sustainability Analysis

In the previous section, we introduced the fundamental question addressed by an assessment of public debt sustainability: Is the government expected (or not) to be able (and willing) to service its financial liabilities in a multiyear horizon, given the prospective economic conditions and policy framework that shape its repayment capacity in the medium to long term and borrowing capacity in the short to medium term? In other words, is the government solvent and liquid?

In this section, we present applied methodologies for assessing public debt sustainability that rely on accounting identities, analytical conditions and empirical thresholds, to which we refer as “accounting,” “analytical” and “empirical” approaches. Each provides various concepts and procedures to operationalize the analysis of sustainability. The accounting approach elaborates the accounting definitions and identities used for projecting debt indicators, e.g., formulas describing the evolution of public debt stock and public debt-to-GDP ratio (sections 1 and 2). The analytical approach builds mathematical conditions of sustainability that may (or may not) be satisfied by the debt indicators, e.g., the government’s intertemporal budget constraint introduced in section 2 or the debt targets presented in this section. The approach quantifies the fiscal policy adjustment required for the indicators to meet the formal definitions of sustainability. Finally, the empirical approach produces

debt thresholds that characterize prudent or excessive public debt levels based on factual evidence and statistical estimations, distinct from accounting conventions or mathematical conditions. Thresholds distinguish between safe and unsafe debt levels concerning their (likely) impact on economic outcomes and are compared with the projected debt indicators to assess sustainability.

Concepts and procedures elaborated by the three approaches constitute the building blocks of widely used frameworks for analyzing debt sustainability developed by international organizations such as the International Monetary Fund (IMF) and the World Bank. Three frameworks are discussed in this section: the IMF's Debt Dynamic Tool (DDT); the IMF's Sovereign Risk and Debt Sustainability Framework (SRDSF), which is the recent successor to the IMF's Market-Access Country Debt Sustainability Analysis (MAC DSA); and the Low-Income Country Debt Sustainability Framework (LIC DSF) jointly developed by the IMF and the World Bank.

1.3.1. Accounting approach and debt projections

The accounting approach elaborates on the accounting definitions and identities utilized to make forward-looking projections (forecasts) of debt indicators. Several formulas for public debt dynamics already introduced are derived from accounting conventions: e.g., equations (3) and (4) to project the public debt stock or equations (20), (21) and (22) to forecast the public debt-to-GDP ratio. The formulas permit projecting debt indicators based on assumed (exogenous) forecasts for the key economic and policy variables driving public debt dynamics. For instance, the public debt-to-GDP ratio is often projected with equations (21) or (22), given the forecasts for economic growth, inflation, exchange rates, interest rates, primary fiscal balance, other net financing needs, contingent liabilities, etc.³⁰

The debt indicators projected using the accounting approach are the basic elements necessary to assess sustainability. The future evolution of debt ratios, which are important examples of debt indicators, permits an appreciation of the accumulation of financial obligations relative to the growth of repayment (or borrowing) capacity. For instance, moderate and nonexplosive dynamics for the public debt-to-GDP ratio often signal a sustainable debt. The other two approaches offer stricter benchmarks, either mathematical conditions or empirical thresholds, against which the debt-indicator projections can be compared, bringing much more rigor to sustainability analysis.

Scenario Analysis, Realism and Uncertainty

A set of assumed (exogenous) forecasts for the key economic and policy variables driving the public debt dynamics is often called a "scenario." The forecasts must be consistent with the specificities of the country's economy and the government's public finances. They should reflect the correlations (co-movements) and feedback between the key variables expected in future years. For instance, primary fiscal deficits caused by the execution of large public investment projects may boost

³⁰ Definitions and identities are conventions used for government accounting (e.g., the preparation of financial statements) or statistical reporting (e.g., the publication of fiscal and debt data), often in the context of well-defined national or international standards.

economic growth and government revenues. Or the accumulation of public debt caused by the primary fiscal deficits may increase interest rates and crowd out private investment, undermining economic growth.

A scenario is just one possible configuration of future circumstances shaping the country's economy and the government's public finances—represented by the forecast of those key variables—that can impact the government's repayment and borrowing capacity. Future circumstances are inherently unknown and uncertain; no analyst possesses perfect foresight about them. For this reason, in practice, the debt indicators are typically projected for various scenarios, considering different assumptions about economic and policy factors that may materialize. This procedure is called “scenario analysis.”

A sustainability assessment is anchored in a “baseline scenario” that reflects the analyst's views about the most likely outlook concerning economic performance and public policies in the foreseeable future. The scenario can be supported by an explicit forecasting exercise for key variables or by the analyst's expert judgment and expectations or by a combination of both. The scenario provides the central reference point for analyzing debt indicators, including analytical and empirical approaches.

Two issues are often raised when the baseline scenario is built up: (i) whether it is realistic or not and (ii) whether unexpected events associated with risks (shocks) may occur and cause material discrepancies (deviations) between *ex ante* projections and *ex post* realizations of key variables and debt indicators.

The issue of realism arises because an analyst may be biased in her own forecasts and expert judgment. For instance, economic-planning authorities tend to be cheerful when forecasting GDP growth associated with public investment projects and policies; being responsible for delivering economic development, they have incentives to envisage strong growth performance in the future. Similarly, fiscal authorities may be cheerful when evaluating revenue gains expected from new taxes or expenditure savings resulting from budget reforms; with a mandate to deliver sound public finances, they have incentives to anticipate strong fiscal performance in the future. However, fiscal authorities may be conservative when forecasting revenues during the annual budget preparation. They may prefer to be cautious about revenue growth and thus resist pressures from government agencies that request large resource allocations to fund their expenditure programs.

In practice, the past performance of key economic and policy variables provides a reference to assess the realism of assumed forecasts in the baseline scenario. This is so because past values are actual realizations representing historical events, exempted from any optimism or pessimism that may affect the analyst's views about future circumstances.

History-driven scenarios are then formulated using earlier figures or historical averages of key variables; intuitively, they assume that observed trends will continue unabated. For example, the “historical scenario” typically uses average figures computed over past years to project all the key variables driving public

debt dynamics. The “constant primary balance scenario” instead projects primary balance assuming it remains at the same level observed last year—or in the current annual budget—while all other key factors are identical to the baseline case.

Debt indicators are calculated for history-driven scenarios and compared against those projected in the baseline case. Whenever large discrepancies arise between all debt-indicator forecasts, the realism of the analyst’s views may be questioned: Why is the prospective performance of key economic and policy variables—embedded into the baseline scenario—so different from past outcomes, which are extrapolated into the future by history-driven ones? To make the case for realism, the analyst should explicitly explain any change in economic conditions or policy reform foreseen in the baseline case and elaborate on their feasibility.³¹ This methodological procedure checks against the analyst’s overly optimistic or pessimistic biases.

The issue of unanticipated events following the materialization of possible risks (shocks) is inherent to any forward-looking assessment because no analyst knows the future, no matter how sophisticated her own forecasts and expert judgment. Uncertainty is an ever-present concern for authorities responsible for economic planning and budgeting: Unforeseen adverse shocks—such as a global pandemic or a sharp variation in commodity prices—can cause actual growth and fiscal performance to deteriorate relative to expectations embedded in baseline projections, even for realistic, unbiased expectations.

In practice, the past performance of key variables provides a reference to assess possible shocks that may hit the assumed forecasts in the baseline scenario. Actual volatility observed back in time indicates whether a key factor could fluctuate widely (or just narrowly) because of large (or small) shocks. Actual volatility indicates whether future realizations may differ significantly (or just slightly) from baseline projections.³²

Shock scenarios—known as stress tests—are then built up with alternative forecasts for the key economic and policy variables that deviate from the baseline ones. The size and timing of the deviations capture the impact of shocks and are typically calibrated using measures of volatility, e.g., the standard deviation of the historical values of a given variable. For example, a “low-growth scenario” considers a negative shock to GDP growth, leading to weaker economic performance than expected in the baseline scenario. The deviation between GDP growth projections in both cases is calibrated using measures of historical volatility. Similarly, a “fiscal-shock scenario” considers a negative shock to the primary balance that causes fiscal performance to deteriorate relative to the baseline scenario. The deviation between the primary-balance projections is attuned to historical volatility.

31 History-driven scenarios can represent circumstances where the analyst’s anticipated economic and policy changes fail to materialize: E.g., public investment projects and policies fail to increase growth over and above the historical average, or new taxes and budget reforms are unsuccessful in improving fiscal balances.

32 Intuitively, if a variable has been volatile in past years, the analyst will see it as “challenging to predict for the years ahead” and deem it more exposed to *large* shocks, which may create *material deviations* relative to the baseline case. On the contrary, if a variable has been stable, it will be “easy to predict” and perceived to be more exposed to *small* shocks, which cause *mild deviations* instead.

Debt indicators are calculated for shock scenarios and compared against baseline projections. Discrepancies between them quantify to what extent unforeseen adverse events materializing may impact debt indicators and divert them from their expected paths. By identifying exposure to risks and quantifying the impact of shocks on debt indicators, this methodological procedure deals with the uncertainty surrounding the baseline scenario.³³

Example #8

The example of Macroland illustrates the use of scenario analysis. Projections for key economic, policy and debt variables corresponding to the baseline scenario are in Tables 1.5-1.7 and Figures 1.1-1.3.

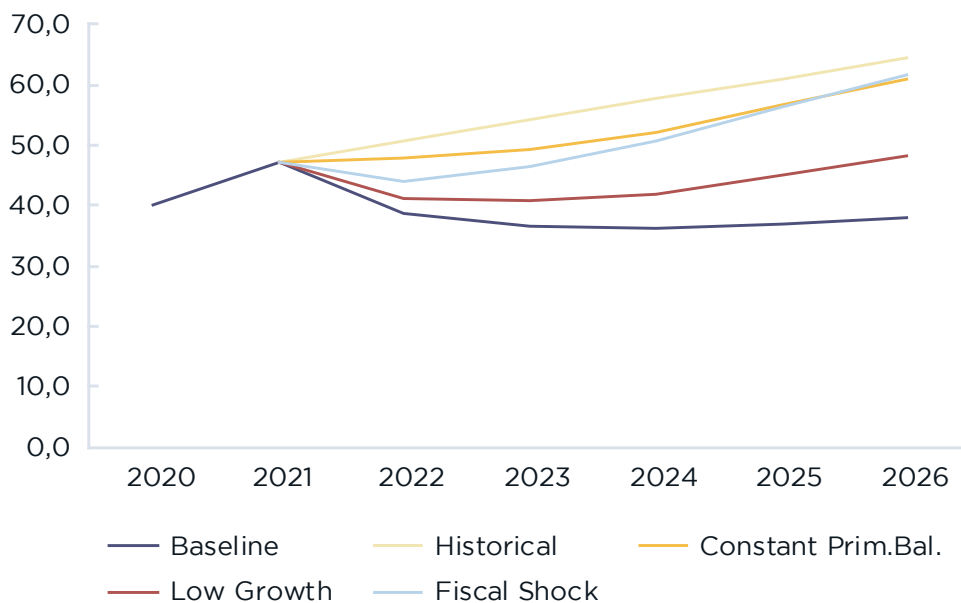
We consider four alternative scenarios: historical, constant primary balance, low growth and fiscal shock. For ease of exposition, the assumptions concerning historical averages and shocks are simple and presented in the Annex (Tables A1-A4). As the key economic and policy drivers of public debt dynamics are recalculated in the history-driven and shock scenarios, the prospective paths for the public debt ratio differ from the baseline outlook. Figure 1.5 displays these paths for all the scenarios under analysis.

For Macroland, the baseline scenario envisages a remarkable structural break between the past and the future in relation to economic growth, currency depreciation and fiscal policy. A comparison of Table 1.5 (baseline scenario) with Tables A1 and A2 (history-driven scenarios) shows that the baseline outlook envisages: (i) much faster expansion of real GDP while past economic growth was weak; (ii) mild currency depreciation as opposed to past large depreciation rates; and (iii) much sounder fiscal policy delivering a broadly balanced budget while earlier years saw fiscal deficits. Thus, the projected public debt-to-GDP ratio in the baseline scenario is systematically lower than in the historical and constant primary-balance scenarios (Figure 1.5). To make the case for realism, the analyst should explicitly explain why and how economic growth will accelerate, currency stability will be achieved and fiscal imbalances will be resolved in the next few years.

Uncertainties about future economic growth and fiscal policy matter for Macroland. A comparison of Table 1.5 (baseline scenario) with Tables A3 and A4 (shock scenarios) shows the sensitivity of the projected public debt ratio to a low-growth environment or weak fiscal performance. Sizable, persistent deterioration of the government's public finances that reduces revenues and increases primary expenditures can lead to a much higher public debt-to-GDP ratio in the fiscal-shock scenario than in the baseline outlook. Macroland's public debt is, therefore, exposed mainly to fiscal risks in the medium term.

³³ There are various options to formulate shocks and produce alternative projections that deviate from the baseline ones. For example: (i) choosing deterministic shocks whose size and timing are calibrated using the historical volatilities observed in key economic and policy variables; or (ii) generating stochastic shocks that capture empirical correlations and feedback between those key variables—possibly estimated from statistical or econometric models—and using them in stochastic simulations whose results are visualized in a fan chart.

Figure 1.5. Macroland Government's Debt-to-GDP Ratio—Baseline and Alternative Scenarios



*prim. = primary, bal. = balance.
Source: Author.*

1.3.2. Analytical approach and formal definitions of sustainability

The analytical approach elaborates on several mathematical conditions that operationalize solvency and liquidity. These formal definitions largely complement the accounting approach. They allow more rigorous evaluation to determine whether debt-indicator projections—and assumed (exogenous) forecasts for key economic and policy variables—are consistent with sustainable public debt. If the projections meet the mathematical conditions, the debt is deemed sustainable; otherwise, it is unsustainable. Compliance (or lack thereof) with formal definitions is a stricter benchmark for assessing debt indicators and their drivers, i.e., expected economic performance and government policies.

The approach develops procedures for quantifying the fiscal-policy adjustment the government should undertake so that the public debt meets a formal definition of sustainability. The approach then tackles the question of what future fiscal policy—represented by the primary balances in the coming years—is required for the government debt to be deemed sustainable. The required fiscal policy may differ from the expected policy envisaged in the baseline scenario (which may fail to meet a mathematical condition). The required fiscal-policy adjustment is the difference between (i) the required path of primary fiscal

balances consistent with debt sustainability and (ii) the baseline projection for the same variable.³⁴

A prominent example of a formal definition of solvency is the government's intertemporal budget constraint presented in equations (19) and (24). The definition is an equality that may be met (or not) by the initial public debt (on the left-hand side) and the analyst's baseline forecasts for future primary fiscal surpluses, other net financial sources, interest rates, nominal GDP growth rates, etc. (on the right-hand side), where variables are measured in nominal terms or as a share of GDP. The equality is met only when the government's projected future resources are sufficient to repay the current stock of financial liabilities and all borrowings that may be required in the coming years. If the equality holds, the public debt is deemed sustainable. The assessment imposes an acid test on projections calculated by the accounting approach using a benchmark built up by the analytical approach.

The intertemporal budget constraint is a rigorous definition of sustainability but has drawbacks for practical uses in applied methodologies. Two of them are worth mentioning here. First, the constraint involves an infinite horizon while, in practice, an analyst projects debt indicators and key economic and policy variables for just a few upcoming years—or perhaps for a few decades—but never for a never-ending horizon. Second, an infinite number of fiscal-policy paths comply with the intertemporal budget constraint, e.g., some paths may have persistent fiscal deficits for many years, followed by large surpluses in the distant future; other paths may have small fiscal surpluses for most of the foreseeable future. No reference exists to compute the required fiscal-policy adjustment whenever the baseline projections for future primary balances—even if they could extend over an infinite horizon—fail to meet the equality in equations (19) or (24). Therefore, despite its valuable theoretical insights, the intertemporal budget constraint is a mild mathematical condition for practical purposes.

Another important example of the analytical approach is the debt target—discussed later in this section—which offers more practical concepts and procedures, and guidance for assessing sustainability.

Example #9

Assessing whether or not a projected path for the public debt-to-GDP ratio satisfies the government's intertemporal budget constraint requires calculating the present value of future primary balances and financing needs shown in equation (24). These are tedious calculations, but good intuition of which paths satisfy such a constraint can be developed simply by looking at some stylized examples, which we construct using the case of Macroland.

³⁴ Conceptually, computing the required path for economic growth—or for any other important economic or policy condition—that ensures sustainable public debt is feasible (and pertinent). The analysis, however, focuses on fiscal policy. To calculate the required path of primary fiscal balances, all other key variables are set at their baseline projections. The government's budget policies concerning revenues and expenditures underpin the primary fiscal balance, which is thus important in any sustainability assessment (sections 1 and 2). On its own, the primary fiscal balance is a major driver of public debt dynamics, as stated in equations (17) and (22). A primary surplus tends to reduce the public debt because it provides the government with own resources to finance debt-service obligations (i.e., amortization and interest payments) or other transactions, while a primary deficit tends to increase the public debt because it may be funded with borrowed funds.

Figure 1.6 displays long-term paths for the public debt ratio throughout a 250-year horizon, from 2022 to 2271. These paths are computed using equation (22), and Annex Table A5 presents the assumed values for key economic and policy variables in the medium and long term. From 2022 to 2026, all the paths assume the values introduced in Table 1.5. From 2027 to 2271, the paths consider different values for the key variables driving debt dynamics presented in Annex Table A5). For ease of exposition and simplicity, the long-term values are constant. All five paths assume the exchange rate to stabilize at 2.9 MA\$ per USD from 2027 to 2271. As for the real GDP growth rate, three paths assume it to be 3% throughout the extended horizon, while two paths envisage zero growth.

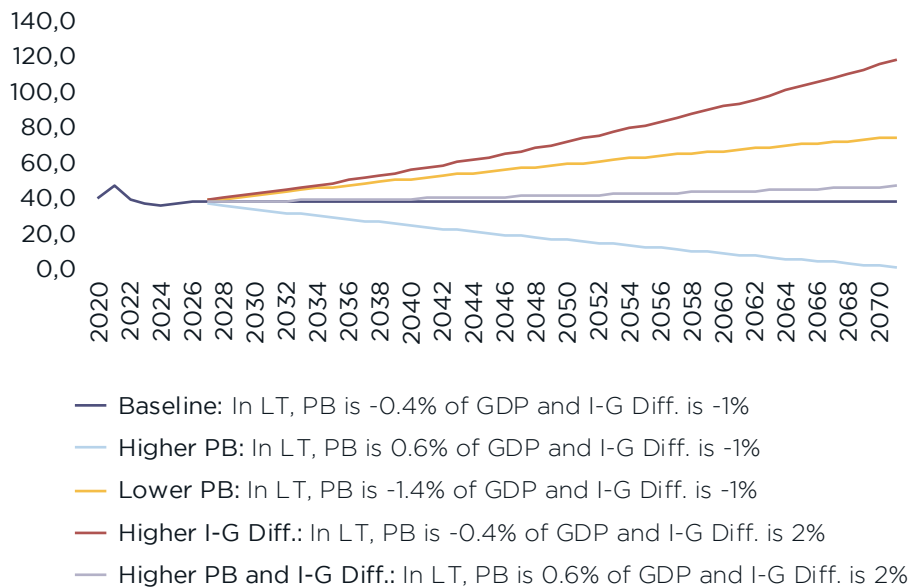
Calculating the long-term paths for the public debt ratio using equation (22) is straightforward since our assumptions imply zero value for other net financing needs, contingent liabilities and valuation effects from 2027 to 2271. Thus, the dynamics of the public debt ratio in the long term depend exclusively on two factors: (i) the primary fiscal balance, expressed as a share of GDP and (ii) the interest-growth differential compared with constant values of average interest rate (i) and nominal GDP growth rate ($GRGDP$).

The public debt ratio in the baseline path (Figure 1.6) is permanently stabilized at 37.8% of GDP and meets the government's intertemporal budget constraint. The path assumes the interest-growth differential to be -1% in the long term and the fiscal primary deficit a tiny 0.4% of GDP.

Two other paths also assume an interest-growth differential of -1% in the long term. One path considers a higher fiscal primary deficit (1.4% of GDP) that causes a rising trend for the public debt ratio. However, the path is not explosive, and the government's intertemporal budget constraint is satisfied. The other case envisages a fiscal primary surplus (0.6% of GDP) that leads to a decreasing trend for the public debt ratio, also meeting the constraint.

A fourth path assumes an interest-growth differential of 2% in the long term and a fiscal primary deficit of a tiny 0.4% of GDP. As the projected public debt ratio rises explosively, it does not satisfy the government's intertemporal budget constraint. The fifth path assumes the same interest-growth differential but with a primary fiscal surplus of 0.6% of GDP. The projected public debt ratio grows over time but not explosively, meeting the constraint.

Figure 1.6. Macroland Government's Debt-to-GDP Ratio and Intertemporal Budget Constraint



I-G Diff. = interest-growth differential, *GDP* = gross domestic product, *LT* = long term, *PB* = primary balance.

Source: Author.

Debt Targets

In practice, a government carrying a high level of public debt—i.e., a heavy debt burden—may formulate its fiscal (budget) policies with an explicit objective to reduce it gradually toward a target value deemed prudent and safe. Similarly, a government that carries a low or moderate debt burden—already perceived as prudent and safe—may set its fiscal (budget) policies explicitly to stabilize the public debt around the current level, which then becomes a target value in itself.

Policy objectives for debt reduction or debt stabilization boil down to an anchor on fiscal policymaking by restricting the admissible net borrowing flow in the future. Given the current level of public debt and the target level to be achieved over a certain time frame, the government can borrow only limited amounts every year to hit the debt target. By setting the admissible net borrowing flow consistent with the policy objective—either debt reduction or debt stabilization—the government imposes discipline on future budget imbalances and financing transactions.³⁵

A government may choose a debt target based on analytical considerations or empirical thresholds. Alternatively, a government often contemplates political and institutional reasons—e.g., setting a 60% target for the public debt-to-GDP ratio to be aligned with the indicative figure envisaged by the European Union's Maastricht Treaty—or setting a debt target as part of a government's economic and financial

³⁵ A government may also set its fiscal policy to explicitly maintain the overall fiscal balance below a certain deficit threshold, thus limiting the net borrowing required to fund it, e.g., setting a 3% target for the fiscal deficit-to-GDP ratio to be aligned with the indicative figure envisaged by the European Union's Maastricht Treaty. By keeping the overall fiscal deficit below the threshold, the fiscal policy may be expected to bring public debt down gradually or stabilize it.

program agreed with the IMF. Concerning policy transparency and accountability, a debt target could be enshrined in a formal law, bylaw or regulation integrated into the government's policy framework or be part of informal guidance for formulating budget and financing policies.

Technically, a government setting a debt target should decide on three elements. First, the target value for the public debt ratio, e.g., 60% of GDP, which is lower than the initial ratio when a debt-reduction objective is pursued or identical for debt stabilization. Second, the time frame (timing)—e.g., five or 10 years—deemed admissible for the fiscal policy in the coming years to reduce the public debt ratio toward the target level or to stabilize it. Third, the smoothness of the fiscal-policy path that would deliver on the debt target, i.e., whether the government prefers an aggressive budget adjustment that front-loads measures for revenue mobilization and/or spending control and thus may achieve quick debt reduction; or, instead, whether the government prefers gradual fiscal consolidation that introduces measures slowly to avoid contractive effects on the economy and reduce debt gradually, as well.³⁶

A formal definition of sustainability can be formulated using the expected achievement of a debt target (or lack thereof) as a benchmark. The analytical approach turns equation (23) into a mathematical condition by replacing the public debt-to-GDP ratio in year T with the target value to be achieved. This equality may be met (or not) by the initial public debt ratio (on the left-hand side) and the analyst's baseline forecasts for future primary fiscal surpluses, other net financial sources, interest rates, nominal GDP growth rates, etc. (on the right-hand side). Key variables are measured as a share of GDP and correspond to years $t+1$ to T , the time frame within which the target should be hit. The equality is met only when the government's projected future resources are sufficient to reduce the public debt ratio from its current level to the target value. If the equality holds, the public debt is deemed sustainable. Similar to the intertemporal budget constraint, the assessment imposes an acid test on projections calculated by the accounting approach using a benchmark elaborated by the analytical approach.

The debt target offers a strict definition of sustainability whose drawbacks for practical uses in applied methodologies are less acute. As it involves a *finite* horizon given by the timeframe, assessing the analyst's projections of debt indicators and key economic and policy variables is more suitable. It is still valid, however, that an infinite number of fiscal-policy paths may deliver on the debt target: E.g., some paths may have persistent fiscal deficits in the immediate future, followed by large surpluses closer to the end of the time frame allowed, while other paths may have small fiscal surpluses for most of the time frame. However, the analyst's expert judgment may distinguish which required fiscal-policy paths are feasible in a finite time frame, considering the smoothness of the paths. The feasible required paths can be used as a reference to compute the required adjustment whenever the

³⁶ Various options concern the smoothness of fiscal adjustment. Often discussed are the following: (i) smooth out the annual variation of the public debt ratio by pursuing an annual reduction of the public debt ratio that is constant over the time frame—the smooth debt-reduction path; (ii) smooth out the annual primary balance-to-GDP ratio by running the same level of primary balance relative to GDP throughout the time frame—the smooth primary-balance path; and (iii) smooth out the annual variation of the primary balance-to-GDP ratio by pursuing an annual increase in the primary balance ratio that is constant over the time frame—the smooth primary-balance adjustment path.

baseline projections fail to meet the equality in equation (23).³⁷ Therefore, although a simple formulation, the debt target is valuable for practical purposes.

A well-known application of the analytical approach is the indicator called debt-stabilizing primary balance. The primary balance-to-GDP ratio delivers a stable public debt-to-GDP ratio for two consecutive years, i.e., it makes the public debt ratio in the current year identical to the level observed in the previous year, thus stabilizing debt in the immediate future.³⁸ To calculate it, the analytical approach turns equation (22) into a mathematical condition by setting a zero variation in the public debt ratio (on the left-hand side) and solving for the primary balance-to-GDP ratio that meets the resulting equality:

$$(22) \frac{\text{Prim.Fisc.Balance}_t}{\text{GDP}_t} = \left(\frac{i_t - \text{GRGDP}_t}{1 + \text{GRGDP}_t} \right) * \frac{\text{Debt}_{t-1}}{\text{GDP}_{t-1}} + \frac{\text{Other Net Fin.Needs}_t}{\text{GDP}_t}$$

where the average interest rate (i_t) and the growth rate of nominal GDP (GRGDP_t) refer to year t , and primary fiscal balance and other net financing needs are measured as a share of GDP in year t .

Example #10

Assessing whether a projected path for the public debt-to-GDP ratio in the baseline scenario satisfies (or not) a debt target is straightforward: Compare the projected and target values in the year when the target is to be achieved. More demanding calculations of present value of future primary balances and financing needs in equation (24) are necessary to quantify the feasible required fiscal-policy paths whenever the baseline projection fails to meet the debt target. A good intuition of which fiscal-adjustment paths can deliver on a debt target can be built by looking at some stylized examples, which we present using the case of Macroland.

Suppose the Macroland government wants to achieve a debt target of 30% of GDP by 2026. As noted in the baseline scenario (Table 1.5 and Figure 1.1), the public debt ratio is expected to stabilize at about 37% of GDP in the medium term. The projected value for 2026 is 37.8%. Given the path of primary fiscal balances underpinning the baseline outlook, i.e., a surplus of 6.5% of GDP in 2022 and recurrent surpluses of 1.5% of GDP from 2023 to 2026, the debt target will not be met.

Given the expected failure to achieve the debt target, we ask what fiscal-policy adjustment would be required to bring the public debt ratio down further to reach 30% of GDP by 2026. Figure 1.7 displays medium-term paths for the public debt ratio and the primary balance (expressed as a share of GDP). The baseline scenario is the reference for the analysis and the only path that does not achieve the debt target.

The other three paths do meet the debt target. They are calculated with equation (24), assuming the government commences fiscal adjustment in 2023. Each

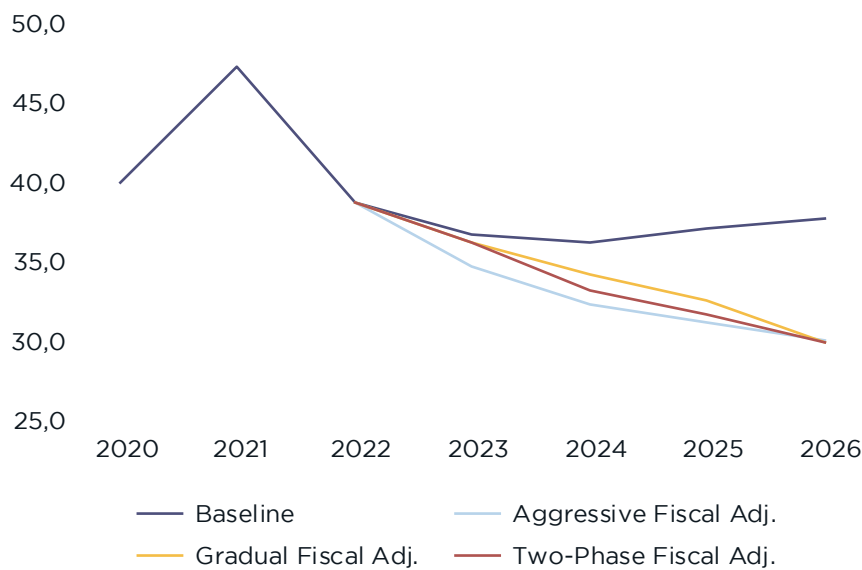
37 The required primary balance path is often compared with other primary-balance projections—e.g., those in the baseline, historical and constant primary-balance scenarios—while the key economic and policy variables driving public debt dynamics are set at their baseline projections. The gap (discrepancy) between the required primary balance path and the other primary-balance projection measures the fiscal adjustment required to achieve the debt target under the preferred time frame and smoothness of conditions.

38 A debt target where the target value is last years' debt ratio and the time frame is just one year is a special case. For ease of exposition, the analysis excludes contingent liabilities and valuation effects.

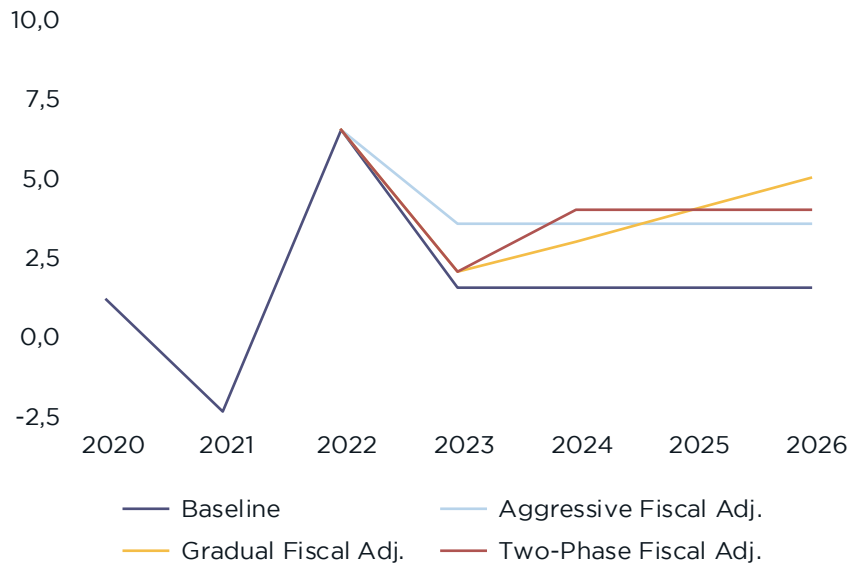
scenario exemplifies the smoothness of budget consolidation. First, the aggressive adjustment implies running fiscal primary surpluses of 3.5% of GDP from 2023 to 2026, compared with surpluses of 1.5% of GDP in the baseline case, i.e., a quick adjustment of 2 p.p. of GDP permanently. Second, the gradual adjustment requires running fiscal primary surpluses of 2% of GDP in 2023, 3% in 2024, 4% in 2025 and 5% in 2026, i.e., a smooth cumulative adjustment of 1 p.p. of GDP every year until 2026. Third, the two-phase adjustment combines a gradual approach in 2023 and an aggressive approach in 2024-2026. In all three scenarios, the government debt reaches the target of 30% of GDP by 2026.

Figure 1.7. Macroland Government's Debt Targets and Required Fiscal Adjustment

Primary Balance (percentage of GDP)



Public Debt (percentage of GDP)



*adj = adjustment, GDP = gross domestic product.
Source: Author.*

1.3.3. Empirical approach and threshold for debt sustainability

The empirical approach estimates various debt thresholds to assess solvency and liquidity. They characterize prudent (safe) or excessive (unsafe) levels of public debt based on factual evidence and statistical methods. Historical data and information describing countries' experiences in public debt accumulation and management, economic performance and government policies are utilized to estimate thresholds, which then relate public debt to economic and policy outcomes observed in the real world. The utilization of empirical evidence distinguishes this approach from the other two, which resort to accounting conventions and mathematical conditions. Examples of debt thresholds will be introduced in this section when presenting the applied methodologies developed by international organizations.

To assess sustainability, threshold values are compared against the debt indicators projected in the baseline and other scenarios.³⁹ This procedure complements the accounting approach by allowing for rigorous evaluation of whether debt-indicator projections are consistent with sustainable public debt. If the projections do not breach the thresholds, the debt is deemed sustainable; otherwise, it is not. Compliance (or lack thereof) with empirical thresholds is a stricter benchmark for assessing debt indicators and their drivers.

The empirical approach can easily measure the gap (discrepancy) between a projected debt indicator and its threshold. The analytical approach can be used to quantify the fiscal-policy adjustment the government should undertake to close the gap. This is akin to our earlier discussion on debt targets since a target value can be established using a threshold value.⁴⁰

Estimation of Debt Thresholds

How are empirical thresholds estimated? The literature is vast, with numerous studies on the subject. Studies collect data and information on countries' debt indicators and a wide array of specific events or enduring processes that are related to public debt accumulation and management, e.g., debt and fiscal distress, a slowdown in potential growth, crowding out private investment, reduced budget space and flexibility, and financial-market and exchange-rate instability. With the help of statistical methods, quantitative comparisons are made between (i) the values of debt indicators observed when those adverse circumstances happened and may have been caused by public debt and (ii) the values observed in normal conditions when no harmful outcomes may be attributed to public debt. Finally, whenever the comparisons suggest that debt indicators significantly differ between adverse and normal circumstances, a debt threshold is estimated to quantify a limit value akin to a tipping point.

The studies aim to identify country-specific levels of public debt that are more (or less) likely to trigger adverse economic and policy outcomes. Estimated thresholds

³⁹ This is analogous to speed limits that differentiate between safe and unsafe driving speeds concerning car accident probabilities. The limits are compared against the actual speed of a car to evaluate (likely) driving outcomes.

⁴⁰ Computing the required path for economic growth—or any other important economic or policy condition—that ensures sustainable public debt, i.e., breaching the gap between a debt projection and a threshold, is conceptually feasible (and pertinent).

are country-specific as they recognize that the peculiarities of the local economy and the government's public finance are of utmost importance when assessing debt sustainability. For example, a 60% public debt-to-GDP ratio may be riskier for a country with dim growth prospects and a weak policy framework than another country with a strong growth outlook and policy framework.

Estimated thresholds offer a probabilistic assessment since empirical research shows, unsurprisingly, that not all causal factors can be identified for all countries at all times. For example, in the historical data, two countries could have carried a similar debt burden—e.g., a 60% public debt ratio—and were similar in many other respects, but one had debt distress and the other did not. Even after controlling for other influences, there is a probability of experiencing debt distress for a 60% public debt ratio, as distinct from a destiny to do so. Statistical estimation, by nature, handles uncertainties and probabilities, not determinist causation.

Given a country's specificity and probabilistic nature, how should empirical thresholds be used? Debt thresholds distinguish between two sets of values for a given debt indicator of a country: (i) prudent values that tend to be seen in normal conditions in said country or a comparable peer and (ii) excessive values that tend to be observed during adverse circumstances. A country faces a higher probability of experiencing an adverse outcome when the projected debt indicator breaches the respective threshold, and a lower probability when no breach occurs. Safety and unsafety are then understood in terms of a country's likelihood of undergoing harmful economic and policy circumstances because of public debt accumulation and management after controlling for other possible causes.

While the procedure outlined above gives a broad idea of how thresholds are estimated and utilized, it is worth stressing that the studies are heterogenous in events and conditions identified, samples of countries and historical periods observed and statistical methods used to compare factual evidence rigorously. Studies differ in control variables introduced in threshold estimation to recognize other influences—unrelated to public debt—that may cause the adverse circumstances observed in a country. Because the elements are varied, a large set of debt thresholds for several indicators are available in the literature. The analyst's expert judgment is necessary—yet again—to choose from among them. The debt thresholds used by the IMF and World Bank are presented below.

1.3.4. Frameworks for debt sustainability analysis developed by international organizations

Concepts and procedures introduced in the preceding subsections are integrated into the frameworks for debt sustainability analysis developed by international organizations. Figure 1.8 gives a snapshot of the purpose and coverage of the three frameworks discussed next.

Figure 1.8. Frameworks for Debt Sustainability Analysis

DSA Framework	“Sovereign Risk and Debt Sustainability Framework (SRDSF)”	“Low-Income Country Debt Sustainability Framework (LIC DSF)”	“Debt Dynamic Tool (DDT)”
Countries	Advanced economies & emerging markets	Low-income countries	All countries
Motivation	Countries with sustained access to international capital markets	Countries relying on concessional resources	Broad application because of simplicity and few data inputs required
Debt Coverage	PPG Debt	“PPG Debt PPG External Debt”	PPG Debt
Approaches	Accounting, analytical and thresholds	Accounting, analytical and thresholds	Accounting and analytical
Horizon	Analysis for short term (1 to 2 years), medium term (up to 5 years), and long term (more than 5 years)	Analysis for long term (20 years)	Analysis for long term (12 years)
Solvency Assessment	Yes	Yes	Yes
Liquidity Assessment	Yes	Yes	No

DSA = debt sustainability analysis, PPG = public and publicly guaranteed.
Source: Author.

1.3.5. International Monetary Fund’s Debt Dynamic Tool (DDT) ⁴¹

The DDT is a simple framework for assessing sustainability developed in 2020 by the IMF (Ormaechea and Martinez, 2021; IMF, 2021b). It operationalizes concepts and procedures from the accounting and analytical approaches, focusing on solvency-related indicators. Its main strengths are (i) the small set of historical data and (exogenous) forecasts required to project public debt-to-GDP ratios in various scenarios; (ii) the flexibility to customize scenarios, including calibration of shocks in terms of size timing, and correlations; (iii) the systematic analysis of debt targets, fiscal-policy adjustment paths and a few indicators inspired by the intertemporal budget constraint; (iv) the simplicity of stochastic simulations and fan charts; and (iv) the ease of using the DDT template, which relies on spreadsheets for calculations and visualizations. A drawback is that the DDT does not deal with liquidity-related indicators or refer to debt thresholds to compare against projections.

The DDT adopts the fiscal a policymaker’s perspective to project the public debt ratio, emphasizing net borrowings required to fund budget imbalances and financing transactions. As inputs, the analyst needs annual historical data and 12-year forecasts for economic growth, inflation, exchange rates, interest rates, primary fiscal balance, other net financing needs and contingent liabilities (e.g., guarantees). Local-currency and foreign-currency debts are tracked separately, and valuation effects are

41 <https://www.imf.org/en/Publications/TNM/Issues/2021/05/28/A-Guide-and-Tool-for-Projecting-Public-Debt-and-Fiscal-Adjustment-Paths-with-Local-and-460153>
<https://www.imf.org/en/Capacity-Development/Training/ICDTC/Schedule/OL/2021/DDTXOL21-21>

considered.⁴² The public debt-to-GDP ratio is calculated for various scenarios, e.g., baseline, historical, constant primary balance, stress tests and stochastic simulations and fan charts. The DDT offers several fiscal-adjustment scenarios consistent with user-defined debt targets, something absent from the other two frameworks.

1.3.6. International Monetary Fund's Sovereign Risk and Debt Sustainability Framework (SRDSF) ⁴³

The SRDSF is a sophisticated framework to assess debt sustainability and evaluate the risk of sovereign debt-related stress (IMF, 2022), introduced by the IMF in 2021 to succeed the MAC DSA, developed in 2002. The SRDSF is built on concepts and procedures from the three approaches, focusing on solvency- and liquidity-related indicators. It is suitable for advanced economies and emerging markets whose sovereigns have regular access to domestic and international capital markets. The SRDSF is new and has yet to be extensively utilized by IMF staff. Pilot applications started in mid-2022 and the spreadsheets implementing the SRDSF have yet to be released to the public at the time of writing. The MAC DSA, instead, for years informed annexes included in IMF Staff Reports related to Article IV Consultations, Program Reviews and other IMF Executive Board official documents.

The SRDSF provides two assessments: One refers to debt sustainability and the other to sovereign debt-related stress risk (sovereign stress risk, for short). Both aim to identify three conditions discussed below.

First is the vulnerability to “sovereign stress events.” The events are defined as episodes where market and/or fiscal pressures related to public debt become acute and may eventually lead to a fiscal adjustment, a program for economic reform, an IMF-supported program including exceptional financing, a debt restructuring or a combination of all of them. A risk rating is established to measure such vulnerability. Thus, the SRDSF concludes whether a country is at high, moderate or low risk of sovereign stress.

Second is the risk that public debt may become unsustainable, characterized by the lack of politically and economically feasible policies to stabilize the debt-to-GDP ratio while reducing the rollover risk.⁴⁴ Thus, the SRDSF concludes whether a country's public debt is “sustainable with a high probability,” “sustainable but not with high probability” or “unsustainable.” When public debt is assessed as unsustainable, the SRDSF understands that fiscal adjustment and new exceptional financing are insufficient to eliminate the sovereign stress risk, and it considers drastic policy measures such as debt restructuring.

Third is the prospects for stabilizing the public debt ratio in the baseline outlook by

42 The DDT does not handle amortization payments, GFN and gross borrowing requirements, thus reducing the inputs the analyst should gather to operate the DDT template. It is necessary only to make assumptions on the average interest rates on both types of debt throughout the forecast horizon. No information is needed concerning future debt repayments, either from the existing financial liabilities or the new ones to be assumed in the coming years.

43 <https://www.imf.org/en/Publications/Policy-Papers/Issues/2022/08/08/Staff-Guidance-Note-on-the-Sovereign-Risk-and-Debt-Sustainability-Framework-for-Market-521884>

44 Debt is also unsustainable when it can be stabilized only through debt restructuring or access to exceptional bilateral financing, even when an IMF-supported program including exceptional financing is in place.

implementing politically and economically feasible policies and reforms. While the baseline outlook may exhibit a public debt ratio that is not stabilized, it may still be feasible to introduce policies and reforms expected to stabilize the ratio, just as the analytical approach intends to identify and quantify.

The SRDSF's main strengths are: (i) the availability of projections for several debt indicators—including measures of vulnerability—in various scenarios; (ii) a detailed analysis of debt-service obligations, gross financing needs, gross borrowing requirements and borrowing options with assumed financing terms; (iii) the elaboration of a risk rating to assess sovereign debt-related stress, which is a type of early-warning system; (iv) the simplicity of stochastic simulations and fan charts; and (v) the rigor and high quality of calculations and visualizations. A drawback is that the SRDSF is technically complex, so an analyst may not find it straightforward to apply. It requires significant amounts of historical data and (exogenous) forecasts as inputs and does not provide a systematic analysis of debt targets and fiscal-policy adjustment paths.

Debt Projections

The SRDSF adopts the debt manager's perspective to project the public debt ratio and other indicators, emphasizing gross and net borrowings required to fund budget imbalances, debt repayments and other net financing needs. The framework tracks individual types of financial liabilities separately, including detailed assumptions on their financing terms (interest rates, currency, redemption profile) and projections for their stocks, issuances and debt-service obligations. As inputs, the analyst needs annual historical data and 10-year forecasts for the same variables for the DDT, as well as the debt-service obligations of outstanding financial liabilities and working assumptions for new debt issuances and their financing terms.⁴⁵ The debt indicators are projected in various scenarios, as in the DDT.

Sovereign Stress Risk Ratings

The SRDSF analyzes risk ratings for three horizons: near term (one to two years ahead), medium term (up to five years ahead) and long term (more than five years ahead). A particular methodology is utilized to assess the risk rating in each horizon.

For the near-term horizon, the SRDSF uses a logit model for sovereign stress in an early-warning system. The logit model calculates the probability (likelihood) that a country's government experiences sovereign stress for a given set of explanatory variables in the near term. Sovereign stress is defined as an episode where market and/or fiscal pressures related to public debt become acute (e.g., a sizeable IMF-supported program, debt restructuring or default, persistently high inflation, loss of market access, financial repression). The explanatory variables affecting the probability of sovereign stress are various country-specific economic, public debt and policy indicators, as well as conditions in global financial markets.

The country's risk rating is high, moderate or low for the near term depending on (i) the value of the probability calculated with the logit model and (ii) the thresholds

⁴⁵ In the DDT, many inputs must be expressed as ratios to GDP, but in the SRDSF, they must be measured in nominal terms.

calibrated by IMF staff for acceptable risk levels (Figure 1.9).⁴⁶ Intuitively, the near-term risk rating is high for a high probability of experiencing sovereign stress over the next one to two years, i.e., above 19.5%. The corresponding risk rating is low for low probability of experiencing sovereign stress in the near term, i.e., below 6.5%. Finally, the near-term risk rating is moderate for probabilities from 6.5% to 19.5%.

For the medium-term horizon, the SRDSF carries out two analyses. One projects the public debt-to-GDP ratio with stochastic simulations visualized in a fan chart. A Debt Fanchart Index is calculated based on key features of the dynamics of the public debt-to-GDP ratio in such an uncertainty-sensitive environment.⁴⁷ The other analysis projects the gross financing needs under stress-test scenarios. A GFN Financeability Index is calculated based on key features of the government's GFN and availability of funding sources in a shock-driven environment.⁴⁸ The values of each of the two indexes can be compared against thresholds (Figure 1.9) to determine risk ratings, as discussed in relation to the near-term risk of sovereign distress.

A composite index—called Medium-Term Index—aggregates the values of the Debt Fanchart Index and the GFN Financeability Index. The country's risk rating is high, moderate or low for the medium term depending on (i) the value of the Medium-Term Index and (ii) the thresholds calibrated by IMF staff for acceptable risk levels (Figure 1.9).⁴⁹ Intuitively, the medium-term risk rating is high for weaker conditions surrounding the future dynamics of debt and financing needs under stress conditions over the next five years, as indicated by a Medium-Term Index value higher than 0.395. The corresponding rating is low for strong conditions on those two fronts, as indicated by a Medium-Term Index value lower than 0.257. Finally, the medium-term risk rating is moderate for Medium-Term Index values ranging from 0.257 to 0.395.⁵⁰

46 The estimation of SRDSF thresholds for the near-term logit model proceeded as follows. First, episodes of sovereign stress were identified as a situation where market and/or fiscal pressures related to public debt became acute. Second, the probability (likelihood) of a country undergoing sovereign stress was formalized using a logit model. The logit model was then estimated with a large sample of observed events, including sovereign-distress episodes and normal situations for many countries throughout the last 50 years or so. Third, the thresholds were calibrated to discriminate between low, moderate and high risk of sovereign distress.

The low-risk threshold is such that only 10% of all the observed sovereign-distress episodes (used to estimate the logit model) happened to have an estimated probability (computed using the logit model itself) below the threshold. In other words, the low-risk threshold is set at a level that makes it unlikely to “miss a crisis,” i.e., to conclude that the country has few chances of undergoing sovereign distress in the next one to two years and later find that distress eventually happens.

The high-risk threshold is such that only 10% of all the observed normal situations (used to estimate the logit model) happened to have an estimated probability (computed using the logit model itself) below the threshold. In other words, the high-risk threshold is set at a level that makes it unlikely to “ring a false alarm,” i.e., to conclude that the country has many chances of undergoing sovereign distress in the next one to two years and later find that no distress eventually happens.

Thresholds are statistically-determined bounds to adequately manage the identification of low, moderate and high risk of sovereign distress while not creating too much risk of missing a crisis (by being too cautious) or ringing a false alarm (by being too aggressive).

47 Three measures are calculated and included in the Debt Fanchart Index: (i) the degree of uncertainty surrounding the medium-term dynamics of the public debt (as measured by the dispersion of the fan chart); (ii) the probability of the public debt ratio not being stabilized over the medium term (as derived from the shock-driven realizations of the debt-stabilizing primary balance); and (iii) an interaction between the medium-term median value of the public debt and a proxy indicator for the country's capacity to manage government debt.

48 Three measures are calculated and included in the GFN Financeability Index: (i) the volume of GFN to be covered in the baseline scenario (as measured by the projected GFN-to-GDP ratio); (ii) the initial bank exposure to government debt; and (iii) the variation in bank holdings of government debt induced by shocks in stress-test scenarios.

49 The calibration of SRDSF thresholds for the medium-term analysis aimed to manage the identification of low, moderate and high risk of sovereign distress, while not creating too much risk of missing a crisis or ringing a false alarm.

50 The SRDSF envisages a handful of special stress-test scenarios to better appreciate risks that may be disruptive in some countries: a banking crisis, a large currency depreciation, a collapse in commodity prices, a natural disaster, the realization of sizable contingent liabilities.

For the long-term horizon, the SRDSF carries out optional analyses of four phenomena that may impact a country's fiscal performance and public debt dynamics in the long run: (i) the demographic changes and age-related public expenditures such as pensions and health; (ii) the discoveries or exhaustion of natural resources that would affect government revenues; (iii) sizable debt redemptions in the long term that imply significant rollover risks; and (iv) the public investments to build resilience and cope with climate change through adaptation and mitigation. A rating for sovereign stress risk in the long term is computed using a combination of alternative scenarios, with the key economic and policy variables calibrated to represent the phenomena pertinent to the country under analysis. The risk rating can be high, moderate or low.

Finally, the SRDSF guides an analyst to determine the overall rating of sovereign stress risk, which takes on board the risk ratings corresponding to each of the three horizons, together with the prospects for stabilizing the public debt ratio in the baseline outlook by implementing feasible policies and reforms. When the individual risk ratings emerging from the different indexes point to different levels of risk and fall short of offering a consistent evaluation of debt vulnerabilities at different time horizons, the analyst's expert judgment must be introduced to make a final call.

Figure 1.9. Sovereign Risk and Debt Sustainability Framework Thresholds

Index & Risk Rating	Low Risk	Moderate Risk	High Risk
Near-Term Logit Model Index	Below 6.3%	6.3% to 19.5%	Above 19.5%
Medium-Term Debt Fanchart Index	Below 1.13	1.13 to 2.08	Above 2.08
Medium-Term GFN Financeability Index	Below 7.6	7.6 to 17.9	Above 17.9
Medium-Term Index	Below 0.257	0.257 to 0.395	Above 0.395

*GFN = gross financing needs.
Source: Author.*

Debt Sustainability Assessment

The SRDSF elaborates a debt sustainability assessment that extends the analysis of sovereign stress risk because it informs what policies can be adopted to resolve the stress that is unfolding, i.e., the sovereign debt-related stress already happening. In the SRDSF, the debt sustainability assessment compares debt projections under baseline and various scenarios, as in the DDT. However, the conclusion is more robust and precise: Public debt is assessed as sustainable with a high probability, sustainable but not with high probability, or unsustainable.

The procedures established in the SRDSF for assessing debt sustainability and sovereign debt-related stress risk are technically complex and demanding. The analyst must use a good dose of her expert judgment to handle the diversity of economic and policy circumstances that jointly determine a country's prospects for sustainability and risks and the variety of quantitative tools built into the SRDSF. The need for expertise as a complement to the mechanical application of the framework

is explicitly recognized by the SRDSF official documents prepared by IMF staff. The documents are a helpful guide on why, how and when the analyst must rely on her expertise to steer a strategic course using the many tactical quantitative tools available to her.

Expert judgment must cope with methodological challenges such as the possibility that individual risk ratings point to different levels of risk and the need to make a call on which should be given more prominence in the final assessment of sustainability and risk. More importantly, given the diversity of economic and policy factors that shape sustainability and risk but are not explicitly addressed by the quantitative tools, the analyst's expertise must also cope with conceptual challenges. For instance, the analyst may have to bring new elements into the final assessment, such as the availability of international reserves or a sovereign wealth fund with significant foreign assets, the access to financing associated with the role of major currencies as safe assets, complex financial liabilities, cross-border effects associated with currency unions or highly integrated trade blocs, etc. The analyst can then make an explicit, well-justified case for improving the risk rating that would otherwise emerge from mechanical comparisons.

A Detour: Debt Vulnerabilities and Heat Map in the Market-Access Country Debt Sustainability Analysis (MAC DSA) ⁵¹

Although incipient, the SRDSF is expected to replace the MAC DSA, its historical predecessor. However, the MAC DSA remains a reference for debt sustainability assessments, and its method to evaluate vulnerabilities is worth exploring here (IMF, 2021a). The framework relies on empirical thresholds as benchmarks against which different debt indicators can be compared, thus improving the sustainability assessment relative to the DDT. Thresholds for the public debt-to-GDP ratio and the GFN-to-GDP ratio are used concerning solvency and liquidity, respectively. Distinguishing between two groups of countries—advanced economies and emerging markets—that have different capacities to repay and manage public debt, the threshold values are group-specific. The threshold for the public debt ratio is 85% for advanced economies and 70% for emerging markets. The threshold for the GFN-to-GDP ratio is 20% for advanced economies and 15% for emerging markets.

The debt indicators projected in the baseline and alternative scenarios are compared against the indicative benchmarks. An indicator breaching its respective threshold is a warning signal suggesting excessive solvency or liquidity risks. The warning signal is more worrisome when a breach happens for the baseline projection since this is the analyst's most likely outlook. It is less worrisome, on the contrary, when the breach occurs in an alternative scenario (e.g., a stress-test case) because it reflects an unexpected, less likely outlook.

The MAC DSA introduces a procedure to quantify sovereign debt-related risks

⁵¹ <https://www.imf.org/external/pubs/ft/dsa/mac.htm>

emerging from solvency or liquidity vulnerabilities (Figure 1.10).⁵² It also presents a heat map comparing vulnerability indicators and their respective benchmarks, using colors to ease visualization. Red indicates a breaching in the baseline scenario, yellow points to a breaching in a stress-test scenario and green means no breaching.

Figure 1.10. Market-Access Country Debt Sustainability Analysis Vulnerability Indicators

Debt profile Emerging Markets			
Debt Profile Indicators	Low risk	Moderate Risk	High Risk
EMBI Global Spreads (basis points)	Below 200	Between 200 and 600	Above 600
External Financing Requirements (% of GDP)	Below 5	Between 5 and 15	Above 15
Public Debt in Foreign Currency (share of total)	Below 200	between 20 and 60	Above 60
Change Short-Term Public Debt (in percent of total debt)	Below 0.5	Between 0.5 and 1	Above 1.0
Public Debt Held by Non-residents (share of total)	Below 15	Between 15 and 45	Above 45
	●	●	●

Debt profile Advanced Economies			
Debt Profile Indicators	Low risk	Moderate Risk	High Risk
Bonds Spreads (basis points)	Below 400	Between 400 and 600	Above 600
External Financing Requirements (% of GDP)	Below 17	Between 17 and 25	Above 25
Change Short-Term Public Debt (in percent of total debt)	Below 0.5	Between 1.0 and 1.5	Above 1.5
Public Debt Held by Non-residents (share of total)	Below 30	Between 30 and 45	Above 45
	●	●	●

EMBI = emerging markets bond index, GDP = gross domestic product.
Source: Author.

1.3.6. Joint International Monetary Fund and World Bank Low-Income Country Debt Sustainability Framework (LIC DSF)⁵³

The LIC DSF is a sophisticated framework for assessing debt sustainability and evaluating the risk of debt distress, developed jointly by the IMF and the World Bank in 2005 (IMF-World Bank, 2021). Like the SRDSF, the LIC DSF integrates concepts and procedures from the three approaches and tackles solvency and liquidity issues. It is suitable for low-income countries whose sovereigns still significantly rely on concessional financing, unlike the SRDSF, which is adequate for countries with access to market financing. The LIC DSF has informed annexes included in IMF

⁵² The Emerging Markets Bond Index Global Spread is a measure of the cost of borrowing. The external financing requirements as a share of GDP indicate liquidity needs. The share of public debt in foreign currency as a measure of currency-risk exposure and the change in short-term public debt as a percentage of total debt, together with the share of public debt held by nonresidents, indicates liquidity risk.

⁵³ <https://www.imf.org/en/About/Factsheets/Sheets/2016/08/01/16/39/Debt-Sustainability-Framework-for-Low-Income-Countries>

Staff Reports and official documents related to loans approved by the World Bank's International Development Association (IDA) Executive Board.

The LIC DSF combines the assessments of debt sustainability and debt-distress risk by adopting the empirical approach and using debt projections and thresholds for sustainability. The assessments aim to identify two conditions discussed below.

First, the vulnerability to debt-distress events, defined as episodes where a country has difficulty servicing debt: E.g., it runs into arrears with official creditors, requests sizable financing for an IMF-supported program or requests restructuring of debt to Paris Club creditors. A risk rating is established to measure such vulnerability. Thus, the LIC DSF concludes whether a country is at high, moderate or low risk of debt distress.

Second, the risk that the public debt may become unsustainable because debt indicators breach their respective thresholds.⁵⁴ Thus, the LIC DSF determines whether a country's public debt is sustainable or unsustainable. One difference between the LIC DSF and the SRDSF is that the former determines only if the public debt is sustainable without assessing whether it happens with high or low probability, as the latter does. Another difference concerns the analysis of policy responses: While the LIC DSF may conclude that the public debt is unsustainable, it does explore whether fiscal adjustment, new exceptional financing or more drastic policy measures (e.g., debt restructuring) would be required to restore sustainability, as the SRDSF does.⁵⁵

The LIC DSF and the SRDSF have strengths in common: (i) the projections of several debt indicators in various scenarios; (ii) a detailed analysis of debt stocks, issuances and debt-service obligations; (iii) the formulation of a debt-distress risk rating for the public external debt and the total public debt (including domestic liabilities); and (iv) the rigor and high quality of calculations and visualizations. Both frameworks also share drawbacks: They are complex, the spreadsheets implementing them are not easy to use, several inputs are required and debt targets and fiscal-policy adjustment paths are not addressed. The LIC DSF does not include stochastic simulations and fan charts.

Debt Projections and Thresholds

The LIC DSF adopts the debt manager's perspective for projecting debt indicators and tracking gross and net borrowings required to fund budget imbalances, debt repayments and other net financing needs, as does the SRDSF. The LIC DSF tracks individual types of financial liabilities separately, emphasizing major classes of financiers, e.g., multilateral creditors, bilateral creditors and commercial creditors, as far as public external debt is concerned. As inputs, the analyst needs annual historical data and 20-year forecasts for the same variables for the SRDSF. The debt indicators are projected in various scenarios, as in the other two frameworks.

54 Debt is also unsustainable when it can be stabilized only through debt restructuring or access to exceptional bilateral financing, even when an IMF-supported program including exceptional financing is in place.

55 There is no systematic analysis of the prospects for stabilizing public debt indicators in the baseline outlook by implementing politically- and economically-feasible policies and reforms.

However, a peculiarity of the LIC DSF is the calculation of debt ratios involving the present value of all future debt-service obligations due until maturity (discounted using a certain discount rate) instead of debt figures expressed in nominal terms. Present-value measures recognize the concessional nature of financing options available to low-income countries because their calculation includes a concessional loan's below-market interest rate, long maturity and grace and smooth redemption profile. The LIC DSF's projections extend to a protracted, 20-year horizon, which is commensurate with the maturities of those loans. The horizon allows assessment of the opportunity for a government to boost repayment capacity in the long term as the country develops and grows.

Another peculiarity of the LIC DSF concerns the thoroughness of empirical thresholds utilized for benchmarking (Figure 1.11). Thresholds correspond to five debt indicators related to solvency and liquidity. Solvency-related indicators are the present value of total public and publicly guaranteed (PPG) debt-to-GDP ratio, the present value of PPG external debt-to-GDP and the present value of PPG external debt-to-exports ratio. For liquidity, the indicators are the PPG external debt service-to-exports ratio and the PPG external debt service-to-revenues ratio.

The LIC DSF distinguishes between three groups of countries, depending on their capacity—strong, medium and weak—to carry debt. For any given debt indicator, the threshold is higher (less stringent) for a country with strong debt-carrying capacity and lower (more stringent) for one with weak capacity. The determination of debt-carrying capacity for each country is undertaken by the World Bank and IMF staff, based on the Country Institutional and Policy Assessment (CPIA) and the prevailing macroeconomic framework (characterized by a country's growth prospects, remittances and international reserves, together with the world's economic growth prospects). A country-specific evaluation of debt-carrying capacity in the LIC DSF provides a more nuanced classification of country groups than the SRDSF's approach, where such capacity is directly associated with whether a country is an advanced economy or an emerging market.

Figure 1.11. Low-Income Country Debt Sustainability Framework Thresholds

"Debt Indicators & Thresholds Depending on Debt-Carrying Capacity"	Strong	Medium	Weak
PV of total PPG debt-to-GDP ratio	70%	55%	35%
PV of PPG external debt-to-GDP ratio	55%	40%	30%
PV of PPG external debt-to-exports ratio	240%	180%	140%
PPG external debt service-to-exports ratio	21%	15%	10%
PPG external debt service-to-revenues ratio	23%	18%	14%

*GDP = gross domestic product, PPG = public and publicly guaranteed, PV = present value.
Source: Author.*

LIC DSF thresholds for public external debt were estimated as follows. First, episodes of "public external debt distress" were identified as a situation where a government has difficulty paying foreign debt, e.g., it falls into arrears with official creditors or requests an IMF program to support the balance of payment. Second,

the probability (likelihood) of a country undergoing public external debt distress was formalized using a probit model. The probit model was then estimated with a large sample of observed events, including debt distress and normal situations for many countries throughout the last 50 years or so. Third, the thresholds were calibrated to reflect the maximum acceptable probability of debt distress, conditional upon a country's capacity to service and manage debt (debt-carrying capacity). Thresholds are statistically-determined bounds above which IMF and World Bank staff consider the risk of public external debt distress excessive.

A similar procedure was used to estimate the LIC DSF thresholds for total public debt. First, episodes of "total public debt distress" characterized a situation where a government faces challenges in paying foreign and domestic debt. Second, the probability (likelihood) of experiencing total public debt distress was formalized with a probit model, estimated using a large sample of debt distress and normal situations. Third, the thresholds were calibrated to reflect the maximum acceptable probability of debt distress, conditional upon a country's debt-carrying capacity. Thresholds are statistically-determined bounds above which IMF and World Bank staff consider the risk of total public debt distress excessive.

Debt Distress Risk Ratings

The LIC DSF assesses two debt-distress risk ratings: One refers to the risk of public external debt distress, and the other to the risk of total public debt distress.

The indicators related to public external debt (Figure 1.11)—projected in baseline and stress-test scenarios—are compared against their respective thresholds to determine the risk of public external debt distress. If an indicator is below its threshold, the likelihood of experiencing public external debt distress is lower than the maximum acceptable probability. Hence, the country carries a prudent level of PPG external debt. On the contrary, if the indicator is above, the likelihood exceeds the maximum acceptable probability, and the country carries an excessive level of PPG external debt. The LIC DSF then quantifies the risk of undergoing public external debt distress since the (estimated) probabilities of occurrence are utilized to calibrate the thresholds.

The LIC DSF builds a risk rating for public external debt distress. A country is then classified into one of four categories: (i) low risk, when none of the indicators breach their thresholds under the baseline scenario or the most extreme stress-test scenario; (ii) moderate risk, when none of the indicators breach their thresholds under the baseline scenario, but at least one indicator breaches its threshold under the most extreme stress-test scenario; (iii) high risk, when any of the four indicators breach their thresholds under the baseline scenario; or (iv) in debt distress, when the country is already running into arrears with official creditors or engaging in nonvoluntary debt negotiations, regardless of any comparison between indicators and thresholds.

To determine the risk of total public debt distress, the analysis of public external debt is extended by comparing the indicator of total public debt and its threshold (Figure 1.11). If this indicator is below the threshold, the likelihood of experiencing total public debt distress is lower than the maximum acceptable probability. Hence, the country carries a prudent level of total PPG debt. Otherwise, the level of total PPG debt is excessive.

The LIC DSF also determines a risk rating for the total public debt distress, in addition to the risk rating for public external debt distress discussed above. The country is classified in one of four categories: (i) low risk, when the risk of public external debt distress is low, *and* the present value of total PPG debt-to-GDP ratio does not breach its threshold under the baseline scenario or the most extreme stress-test scenario; (ii) moderate risk, when the risk of public external debt distress is moderate, or alternatively, when the risk of public external debt distress is low, *and* the PV of total PPG debt-to-GDP ratio breaches its threshold under the most extreme stress test but not under the baseline scenario; (iii) high risk, when any of the five debt indicators breach their thresholds or indicative benchmarks under the baseline scenario; or (iv) in-debt-distress, when the country is already having difficulty meeting its financial obligations, either domestic or external, or both.

The procedure for determining debt-distress risk ratings must be complemented with the analyst's expert judgment, just like in the SRDSF. The need for expertise to complement an otherwise mechanical application of this framework is explicitly addressed in the LIC DSF official documents prepared by the World Bank and IMF Staff. The official documents provide practical guidance on why, how and when the analyst must rely on her own expertise to steer a strategic course and bring coherence to the tactical quantitative tools made available to her.

The LIC DSF calls for expert judgment when the analysis encounters circumstances that may justify a deviation from the mechanical comparison of debt-indicator projections and threshold. For instance, some breaches are temporary or occur in the distant future when the reliability of long-term projections is more questionable. Or factors may attenuate the risk of debt distress, e.g., the availability of international reserves or a sovereign wealth fund with significant foreign assets or the access to financing associated with investment projects that are expected to be profitable and ensure debt repayment. The analyst can then make an explicit, well-justified case for improving the risk rating that would emerge from mechanical comparisons.

1.4. Implications for Lenders

In the previous section, we introduced three important frameworks for assessing debt sustainability developed by international financial institutions. Multilateral, bilateral and commercial creditors, as well as market investors, often utilize debt sustainability assessments for (at least) two purposes: (i) to build up market intelligence pertinent to inform their financing operations in a country, including lending to public- and private-sector entities; and (ii) to evaluate the creditworthiness of a sovereign government to whom lenders are providing credit directly or are engaging in other operations (e.g., lenders providing credit to entities and receiving sovereign guarantees as credit enhancements).

Lenders often monitor and evaluate the current and future economic and policy conditions facing a given country and its sovereign, as reflected in the baseline and risk scenarios underpinning debt sustainability assessments. Monitoring and evaluation are essential to the market intelligence required to make informed

decisions about financing operations, investment projects and risk management. When a country exhibits weak macroeconomic prospects and an inadequate policy framework, financiers are less willing to engage in credit operations and expose themselves to systemic, country-level risk on top of the risks specific to the financed sectors and projects.

Lenders typically determine the creditworthiness of a sovereign counterparty—i.e., whether it is solvent and liquid—as reflected in the debt sustainability assessments' findings concerning the debtor's repayment and borrowing capacity. Government debt analysis and risk ratings—determined in-house or, if available, taken from credit-rating agencies—are key elements of the mandatory “due diligence” followed by various official creditors and market investors to appraise, approve, monitor and evaluate credit operations. Whenever a government is perceived as a high-risk debtor, financiers guided primarily by “profit-making objectives” may restrict their lending. On the other hand, financiers guided by “developmental objectives” may continue providing financial resources under specific arrangements, e.g., applying concessional terms to loans and providing grants to the government or funding those resources with dedicated capital injections from stakeholders who do not expect to make profits or even recoup said injections.

In practice, the IMF utilizes the debt sustainability analyses conducted with the SRDSF, MAC DSA and LIC DSF to inform the macroeconomic monitoring and surveillance of country members. The IMF relies on these frameworks for policy dialogue and assessment and to design programs for countries seeking its technical and financial assistance. The mix of program measures aimed at “adjustment, financing or debt restructuring” heavily depends on whether public debt can be sustainable under alternative policy options that a government may commit to adopting.

For its part, World Bank's IDA uses the LIC DSF's risk ratings—among other criteria—to determine the mix of grants and loans extended to low-income countries and the lending terms. Other regional development banks such as the Asian Development Bank, the Inter-American Development Bank and the African Development Bank also rely on the LIC DSF analysis for their credit allocation and risk management protocols.

Under the auspices of the international financial institutions, the Paris Club and the G20, the LIC DSF has played a crucial role in debt-relief initiatives, including the Highly-Indebted Poor-Country Initiative (HIPC), the Multilateral Debt Relief Initiative (MDRI) and the G20 Common Framework. The LIC DSF's debt sustainability analysis and risk ratings provided a reference for setting eligibility criteria (e.g., high-risk countries should receive debt relief) and for determining the amount of debt relief to be provided by participating creditors (e.g., debt relief should reduce a country's present value of debt to a certain level).

1.5. Conclusion

Public debt is an essential tool for the government to fund public investments—including infrastructure projects—in support of long-term economic development and to handle budget deficits when pursuing short-term macroeconomic stabilization via countercyclical fiscal policy. A government typically prefers to finance capital projects through borrowed funds rather than use current revenues, e.g., tax and non-tax revenues. Debt financing opens a window of opportunity to broadly match future debt-service obligations with the capital project's expected returns—or other own resources that may fund those obligations when they fall due—while smoothing out the taxation burden on firms and households. A government favors borrowing and financing fiscal deficits to stabilize or scale up public spending during recessions, adverse circumstances or emergencies, thus helping stabilize the macroeconomy and offset revenue shortfalls.

Public debt is also an asset for the private sector to save and maintain wealth and develop domestic financial markets and institutions. Firms and households, directly or indirectly through financial intermediaries, invest in sovereign bonds, securities and other claims on public-sector entities. The demand for public debt builds upon important advantages associated with those assets under normal circumstances. For instance, sovereign bonds and securities are often a convenient store of value for long-term savings and short-term liquidity management, and bank credit and loans to public-sector entities typically receive privileged treatment from financial regulations. In practice, the supply of government debt with various contractual conditions and financing terms is essential for developing domestic financial markets and institutions.

The government and the private sector can seize the advantages of using public debt only to the extent that the former is perceived as solvent and liquid, with a robust capacity to repay and borrow. Only when investors, creditors and lenders are confident that their claims will be honored by the government in due time would they be willing to provide it with a sustained—even growing—flow of financing. Solvency and liquidity are then prerequisites to ensure that the government has access to borrowed funds from investors purchasing sovereign bonds and securities, as well as from domestic banks, international financial institutions and official lenders extending credit and loans.

Public debt is sustainable when the debtor government is solvent and liquid—features that largely depend on prospective favorable economic conditions, an adequate policy framework and the feasibility of new reforms and initiatives that may be adopted to improve public finances. Investment-financing loans contribute to the government's solvency to the extent that the capital projects being funded are realistically expected to boost economic activity, expand budget revenues and strengthen repayment capacity in the medium to long term. The loans can potentially create the resources necessary to secure their own repayment (totally or partially) and are thus worth contracting for the government and its financiers.

Assessing public debt sustainability is a regular practice for the government and its financiers. Such assessment addresses a fundamental question: Is the government expected (or not) to be able (and willing) to service its financial liabilities in a multiyear horizon, given economic and policy conditions that shape its repayment capacity in the medium to long term and borrowing capacity in the short to medium term? Applied methodologies for assessing public debt sustainability rely on accounting identities, analytical conditions and empirical thresholds. They typically involve debt projections, quantitative formalizations, statistical methods, scenarios and uncertainties. Technical complexity and sophistication are always present to some extent, large or small.

The SRDSF and LIC DSF are well-established frameworks for analyzing debt sustainability and provide robust concepts and procedures. Nevertheless, while the frameworks are useful, an analyst's expert judgment always plays a key role in evaluating the fundamental economic and policy determinants underpinning a sustainable public debt.

In sum, this chapter has explained the processes and methodologies to answer the first basic question in sustainable development and infrastructure financing: How much debt is too much debt? With that answer at hand, governments can then decide how best to borrow (medium-term strategy), when to borrow (annual borrowing plan), how to optimize the resulting debt portfolio (liability management), how to protect that portfolio (risk management), how to account for potential obligations (contingent liabilities), what to do about the special case of borrowing for infrastructure and how to set up the accounting, legal and institutional frameworks to keep debt in check. The rest of the chapters address each of those topics individually. But it is worth remembering that the first order of business is always to put—and keep—debt on a macroeconomically sustainable path.

References

- Aisen, A. and D. Hauner. 2008. Budget Deficits and Interest Rates: A Fresh Perspective. IMF Working Paper 08/42. Washington, DC: International Monetary Fund.
- Arbelaez, C. and N. Sobrinho. 2017. Government Financial Assets and Debt Sustainability. IMF Working Paper 17/173. Washington, DC: International Monetary Fund.
- Baldacci, E., I. Petrova, N. Belhocine, G. Dobrescu, and S. Mazraani. 2011. Assessing Fiscal Stress. IMF Working Paper 11/100. Washington, DC: International Monetary Fund.
- Bassanetti, A., C. Cottarelli, and A. Presbitero. 2019. Lost and Found: Market Access and Public Debt Dynamics. *Oxford Economic Papers* 71, issue 2: 445-71.
- Berg, A., E. Berkes, C. Pattillo, A. Presbitero, and Y. Yakhshilikhov. 2014. Assessing Bias and Accuracy in the World Bank—IMF’s Debt Sustainability Framework for Low-Income Countries. IMF Working Paper 14/48. Washington, DC: International Monetary Fund.
- Debrun, X., J. Ostry, T. Willems, and C. Wyplosz. 2019. Debt Sustainability. In *Sovereign Debt: A Guide for Economists and Practitioners*, edited by S. Ali Abbas, A. Pienkowski, and K. Rogoff. International Monetary Fund and Oxford University Press.
- European Bank for Reconstruction and Development, International Monetary Fund (IMF), Organisation for Economic Co-operation and Development, and World Bank. 2011. *Local Currency Bond Market: A Diagnostic Framework*. Washington, DC: IMF.
- Escolano, J. 2010. *A Practical Guide to Public Debt Dynamics, Fiscal Sustainability, and Cyclical Adjustment of Budgetary Aggregates*. Technical Notes and Manuals 10/02. Washington, DC: International Monetary Fund.
- European Commission. 2016. *Debt Sustainability Monitor*, January 2017. Brussels.
- Ferrarini, B. and A. Ramayandi. 2012. Public Debt Sustainability Assessments for Developing Asia, in *Public Debt Sustainability in Developing Asia* edited by B. Ferrarini, J. Raghbendra, and A. Ramayandi. Manila: Asian Development Bank.
- Ferrarini, B. and A. Ramayandi. 2015. *Public Debt Sustainability in Developing Asia: An Update*. ADB Economics Working Paper Series 468. Manila: Asian Development Bank.
- Ferrarini, B., M. Giugale, and J. J. Pradelli, eds. 2022. *The Sustainability of Asia’s Debt*. Edward Elgar Publishing.
- International Monetary Fund. 2002. *Assessing Sustainability*. Washington, DC.
- International Monetary Fund. 2005. *Information Note on Modifications to the Fund’s Debt Sustainability Assessment Framework for Market Access Countries*. Washington, DC.
- International Monetary Fund. 2007. *Manual on Fiscal Transparency*. Washington, DC.
- International Monetary Fund. 2011. *Modernizing the Framework for Fiscal Policy and Public Debt Sustainability Analysis*. Washington, DC.
- International Monetary Fund. 2013. *Staff Guidance Note for Public Debt Sustainability Analysis in Market-Access Countries*. Washington, DC.
- International Monetary Fund. 2014. *Government Finance Statistics Manual 2014*. Washington, DC.
- International Monetary Fund. 2017. *Guidance Note on the Bank-Fund Sustainability Framework for Low Income Countries*. Washington, DC.

- International Monetary Fund. 2017. Review of the Debt Sustainability Framework in Low-Income Countries: Proposed Reforms. IMF Policy Paper. Washington, DC.
- International Monetary Fund. 2021a. Debt Sustainability Analysis for Market-Access Countries.
- International Monetary Fund. 2021b. Projecting Public Debt—The Public Debt Dynamics Tool (DDTX).
- International Monetary Fund (IMF). 2021c. Review of the Debt Sustainability Framework for Market Access Countries. IMF Policy Paper 2021/003. Washington, DC.
- International Monetary Fund. 2022. Staff Guidance Note on the Sovereign Risk and Debt Sustainability Framework for Market Access Countries. Policy Paper 2022/039. Washington, DC.
- International Monetary Fund and International Development Association. 2005. Operational Framework for Debt Sustainability Assessments in Low-Income Countries—Further Considerations. Washington, DC.
- International Monetary Fund and World Bank. 2014. Revised Guidelines for Public Debt Management. IMF Policy Paper. Washington, DC.
- International Monetary Fund and World Bank. 2005. Operational Framework for Debt-Sustainability Assessments in Low-Income Countries—Further Considerations. Washington, DC.
- International Monetary Fund and World Bank. 2012. Revisiting the Debt Sustainability Framework for Low-Income Countries. Washington, DC.
- International Monetary Fund and World Bank. 2013. Staff Guidance Note on the Application of the Joint Bank-Fund Debt Sustainability Framework for Low-Income Countries. Washington, DC.
- International Monetary Fund and World Bank. 2015. Public Debt Vulnerabilities in Low-Income Countries: The Evolving Landscape. Washington, DC.
- International Monetary Fund and World Bank. 2021. Joint World Bank-IMF Debt Sustainability Framework for Low-Income Countries.
- Laubach, T. 2009. New Evidence on the Interest Rate Effects of Budget Deficits and Debt. *Journal of the European Economic Association* 7, no. 4: 858-85.
- Manasse, P. and N. Roubini. 2005. “Rules of Thumb” for Sovereign Debt Crises. International Monetary Fund Working Paper 05/42. Washington, DC.
- Moody’s Investor Services. Rating Methodology: Sovereign Bond Ratings, 2018.
- Ormaechea, S. A. and L. Martinez. 2021. A Guide and Tool for Projecting Public Debt and Fiscal Adjustment Paths with Local- and Foreign-Currency Debt. Technical Notes and Manuals 2021/005. Washington, DC: International Monetary Fund.
- Paladino, J. P. and J. J. Pradelli. 2022. Debt in Asia: Anatomy, Evolution, and Prospects, in *The Sustainability of Asia’s Debt*, edited by B. Ferrarini, M. Giugale, and J. J. Pradelli, 31-65. Edward Elgar Publishing.
- Panizza, U. 2008. Domestic and External Public Debt in Developing Countries. United Nations Conference on Trade and Development Discussion Paper 188. Washington, DC.

Reinhart, C. M. and K. S. Rogoff. 2009. *This Time is Different: Eight Centuries of Financial Folly.* Princeton, NJ: Princeton University Press.

Willems, T. and J. Zettelmeyer. 2021. *Sovereign Debt Sustainability and Central Bank Credibility.* CEPR Discussion Papers 16817. London: Centre for Economic Policy Research.

World Bank. 2015a. *IDA's Non-Concessional Borrowing Policy: Review and Update.* Washington, DC.

World Bank. 2015b. *The Economics of the Macro-Fiscal Model.* Washington, DC.

Annex

Table A1. Macroland Government's Fiscal and Financing Data and Public Debt Dynamics—Historical Scenario

	2020 (hist.)	2021 (hist.)	2022 (for.)	2023 (for.)	2024 (for.)	2025 (for.)	2026 (for.)	Historical Average
GDP								
GDP at Current Prices (MA\$ million)	250,0	275,0	291,7	309,5	328,3	348,2	369,4	
GDP at Current Prices (% annual growth)	9,2	10,0	6,1	6,1	6,1	6,1	6,1	
GDP at Constant Prices (% annual growth)	3,0	0,0	2,0	2,0	2,0	2,0	2,0	2% real GDP growth
GDP Deflator (% annual growth)	6,0	10,0	4,0	4,0	4,0	4,0	4,0	4% GDP deflator inflation
Exchange Rates								
Exchange Rate at end-of- year (MA\$ per US\$)	2,0	3,0	3,2	3,3	3,5	3,6	3,8	5% currency depreciation
Exchange Rate average- during-year (MA\$ per US\$)	2,0	2,5	3,1	3,2	3,4	3,6	3,7	5% currency depreciation
Interest Rates on Public Debt								
Avg. Interest Rate on MA\$-denom. Debt (%)	4,0	4,0	3,5	3,5	3,5	3,5	3,5	3.5% interest rate
Avg. Interest Rate on US\$-denom. Debt (%)	2,0	2,0	1,8	1,8	1,8	1,8	1,8	1.8% interest rate
Fiscal & Financing Indicators (MA\$ million, unless specified)								
Revenues	25,0	20,0	29,2	30,9	32,8	34,8	36,9	10% revenue- to-GDP ratio
Expenditures								
Primary Expenditures	22,0	26,5	37,9	40,2	42,7	45,3	48,0	13% primary expenditure- to-GDP ratio
Interest Payments	6,0	3,6	3,8	4,1	4,7	5,4	6,0	
Interest on MA\$-denom. Debt	3,5	2,8	3,0	3,0	3,4	3,9	4,5	
Interest on US\$-denom. Debt	2,5	0,8	0,8	1,2	1,3	1,4	1,5	
Overall Fiscal Balance	-3,0	-10,0	-12,6	-13,4	-14,6	-15,8	-17,1	
Primary Fiscal Balance	3,0	-6,5	-8,8	-9,3	-9,8	-10,4	-11,1	
Financing Needs	10,0	10,0	8,8	9,3	9,8	10,4	11,1	3% financing needs-to-GDP ratio
Financing Sources	5,0	5,0	5,8	6,2	6,6	7,0	7,4	2% financing sources-to- GDP ratio
Other Net Financing Needs	5,0	5,0	2,9	3,1	3,3	3,5	3,7	
Debt Issuances (Gross Borrowings)								
MA\$-denom. Debt Issuance (MA\$ million)	12,0	15,0	18,6	17,3	18,5	19,7	21,1	

	2020 (hist.)	2021 (hist.)	2022 (for.)	2023 (for.)	2024 (for.)	2025 (for.)	2026 (for.)	Historical Average
Valuation Effect (% of GDP)		5,5	0,9	1,0	1,1	1,1	1,2	
Contribution of Interest- Growth Diff. (p.p.) of which:		-2,3	-1,4	-1,6	-1,7	-1,8	-1,9	
Contrib. of Real Interest Rate (p.p.)		-2,3	-0,5	-0,6	-0,6	-0,7	-0,7	
Contrib. of Real GDP Growth (p.p.)		0,0	-0,9	-1,0	-1,0	-1,1	-1,2	

avge. = average, contrib. = contribution, denom. = denominated, diff. = differential, for. = forecast, GDP = gross domestic product, hist. = historical, p.p. = percentage point, V.E. = valuation effect.
Source: Author.

Table A2. Macroland Government's Fiscal and Financing Data and Public Debt Dynamics—Constant Primary Balance Scenario

	2020 (hist.)	2021 (hist.)	2022 (for.)	2023 (for.)	2024 (for.)	2025 (for.)	2026 (for.)	Assumption
GDP								
GDP at Current Prices (MA\$ million)	250,0	275,0	300,3	324,8	347,9	369,1	391,6	
GDP at Current Prices (% annual growth)	9,2	10,0	9,2	8,2	7,1	6,1	6,1	
GDP at Constant Prices (% annual growth)	3,0	0,0	4,0	4,0	4,0	3,0	3,0	
GDP Deflator (% annual growth)	6,0	10,0	5,0	4,0	3,0	3,0	3,0	
Exchange Rates								
Exchange Rate at end-of- year (MA\$ per US\$)	2,0	3,0	2,5	2,5	2,7	2,8	2,9	
Exchange Rate average- during-year (MA\$ per US\$)	2,0	2,5	2,7	2,5	2,6	2,8	2,9	
Interest Rates on Public Debt								
Avg. Interest Rate on MA\$-denom. Debt (%)	4,0	4,0	4,5	4,5	4,0	4,0	4,0	
Avg. Interest Rate on US\$-denom. Debt (%)	2,0	2,0	2,0	2,0	2,0	2,0	2,0	
Fiscal & Financing Indicators (MA\$ million, unless specified)								
Revenues	25,0	20,0	21,8	23,6	25,3	26,8	28,5	Constant as % of GDP
Expenditures	28,0	30,0	33,5	36,4	38,8	41,6	44,8	
Primary Expenditures	22,0	26,5	28,9	31,2	33,5	35,5	37,7	Constant as % of GDP
Interest Payments	6,0	3,6	4,6	5,2	5,4	6,1	7,1	
Interest on MA\$- denom. Debt	3,5	2,8	3,8	4,2	4,3	4,9	5,8	
Interest on US\$- denom. Debt	2,5	0,8	0,8	1,0	1,1	1,2	1,3	
Overall Fiscal Balance	-3,0	-10,0	-11,7	-12,8	-13,5	-14,8	-16,3	
Primary Fiscal Balance	3,0	-6,5	-7,0	-7,6	-8,2	-8,7	-9,2	

	2020 (hist.)	2021 (hist.)	2022 (for.)	2023 (for.)	2024 (for.)	2025 (for.)	2026 (for.)	Assumption
Financing Needs	10,0	10,0	10,0	10,8	11,6	12,3	13,0	
Financing Sources	5,0	5,0	0,0	7,0	7,5	8,0	8,4	
Other Net Financing Needs	5,0	5,0	10,0	3,8	4,1	4,3	4,6	
Debt Issuances (Gross Borrowings)	22,0	27,5	40,2	25,6	26,8	31,3	33,4	
MA\$-denom. Debt Issuance (MA\$ million)	12,0	15,0	26,7	18,1	19,0	20,3	22,0	
US\$-denom. Debt Issuance (US\$ million)	5,0	5,0	5,0	3,0	3,0	4,0	4,0	
Debt Repayments (Amortizations)	14,0	12,5	18,5	9,0	9,2	12,3	12,6	
MA\$-denom. Debt Repaym. (MA\$ million)	14,0	0,0	18,5	4,0	4,0	4,0	4,0	
US\$-denom. Debt Repaym. (US\$ million)	0,0	5,0	0,0	2,0	2,0	3,0	3,0	
Contingent Liabilities (MA\$ million, unless specified)								
Recognition of Contingent Liabilities	0,0	0,0	0,0	0,0	0,0	6,0	6,0	
MA\$-denom. Contingent Liabilities (MA\$ million)	0,0	0,0	0,0	0,0	0,0	6,0	6,0	
US\$-denom. Contingent Liabilities (US\$ million)	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
Valuation Effects (MA\$ million)								
Valuation Effects		15,0	-8,5	0,0	4,3	2,2	2,4	
V. E. on Initial US\$-denom. Debt Stock		15,0	-7,5	0,0	4,2	2,2	2,3	
V. E. on Net Issuance of US\$-denom. Debt Flow		0,0	-1,0	0,0	0,1	0,0	0,1	
Public Debt Indicators (MA\$ million, unless specified)								
Public Debt Stock at end-of-year (MA\$ million)	100,0	130,0	143,2	159,8	181,7	209,1	238,3	
MA\$-denom. Debt Stock (MA\$ million)	70,0	85,0	93,2	107,3	122,3	144,7	168,7	
US\$-denom. Debt Stock (US\$ million)	15,0	15,0	20,0	21,0	22,0	23,0	24,0	
Public Debt Ratio: Level								
Public Debt Ratio (Debt Stock as % of GDP)	40,0	47,3	47,7	49,2	52,2	56,6	60,9	
Public Debt Ratio: Annual Variation & Contributions (I)								
Annual Variation in Public Debt Ratio (p.p.)		7,3	0,4	1,5	3,0	4,4	4,2	
of which:								
Annual Variation in Debt Stock (% of GDP)		10,9	4,4	5,1	6,3	7,4	7,5	
Contribution of Nominal GDP Growth (p.p.)		-3,6	-4,0	-3,6	-3,3	-3,0	-3,3	

	2020 (hist.)	2021 (hist.)	2022 (for.)	2023 (for.)	2024 (for.)	2025 (for.)	2026 (for.)	Assumption Shock
Fiscal & Financing Indicators (MA\$ million, unless specified)								
Revenues	25,0	20,0	35,0	37,1	39,0	40,6	42,2	Shock impacts on revenue growth
Expenditures	28,0	30,0	25,0	39,2	41,6	44,1	47,1	
Primary Expenditures	22,0	26,5	20,4	35,0	37,5	39,8	42,2	
Interest Payments	6,0	3,6	4,6	4,2	4,1	4,3	4,9	
Interest on MA\$- denom. Debt	3,5	2,8	3,8	3,2	3,0	3,1	3,6	
Interest on US\$- denom. Debt	2,5	0,8	0,8	1,0	1,1	1,2	1,3	
Overall Fiscal Balance	-3,0	-10,0	10,0	-2,1	-2,6	-3,5	-4,9	
Primary Fiscal Balance	3,0	-6,5	14,6	2,1	1,5	0,8	0,0	
Financing Needs	10,0	10,0	10,0	10,6	11,1	11,6	12,1	
Financing Sources	5,0	5,0	0,0	7,0	7,4	7,7	8,0	
Other Net Financing Needs	5,0	5,0	10,0	3,6	3,8	3,9	4,1	
Debt Issuances (Gross Borrowings)	22,0	27,5	18,5	14,7	15,6	19,7	21,5	
MA\$-denom. Debt Issuance (MA\$ million)	12,0	15,0	5,0	7,2	7,8	8,7	10,1	
US\$-denom. Debt Issuance (US\$ million)	5,0	5,0	5,0	3,0	3,0	4,0	4,0	
Debt Repayments (Amortizations)	14,0	12,5	18,5	9,0	9,2	12,3	12,6	
MA\$-denom. Debt Repaym. (MA\$ million)	14,0	0,0	18,5	4,0	4,0	4,0	4,0	
US\$-denom. Debt Repaym. (US\$ million)	0,0	5,0	0,0	2,0	2,0	3,0	3,0	
Contingent Liabilities (MA\$ million, unless specified)								
Recognition of Contingent Liabilities	0,0	0,0	0,0	0,0	0,0	6,0	6,0	
MA\$-denom. Contingent Liabilities (MA\$ million)	0,0	0,0	0,0	0,0	0,0	6,0	6,0	
US\$-denom. Contingent Liabilities (US\$ million)	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
Valuation Effects (MA\$ million)								
Valuation Effects		15,0	-8,5	0,0	4,3	2,2	2,4	
V. E. on Initial US\$- denom. Debt Stock		15,0	-7,5	0,0	4,2	2,2	2,3	
V. E. on Net Issuance of US\$-denom. Debt Flow		0,0	-1,0	0,0	0,1	0,0	0,1	
Public Debt Indicators (MA\$ million, unless specified)								
Public Debt Stock at end- of-year (MA\$ million)	100,0	130,0	121,5	127,2	137,9	153,6	170,9	
MA\$-denom. Debt Stock (MA\$ million)	70,0	85,0	71,5	74,7	78,5	89,2	101,3	
US\$-denom. Debt Stock (US\$ million)	15,0	15,0	20,0	21,0	22,0	23,0	24,0	
Public Debt Ratio: Level								
Public Debt Ratio (Debt Stock as % of GDP)	40,0	47,3	41,3	40,7	42,0	45,0	48,1	

	2020 (hist.)	2021 (hist.)	2022 (for.)	2023 (for.)	2024 (for.)	2025 (for.)	2026 (for.)	Assumption Shock
Public Debt Ratio: Annual Variation & Contributions (I)								
Annual Variation in Public Debt Ratio (p.p.)		7,3	-6,0	-0,5	1,3	3,0	3,1	
of which:								
Annual Variation in Debt Stock (% of GDP)		10,9	-2,9	1,8	3,2	4,6	4,9	
Contribution of Nominal GDP Growth (p.p.)		-3,6	-3,1	-2,4	-2,0	-1,6	-1,7	
Public Debt Ratio: Annual Variation & Contributions (III)								
Annual Variation in Public Debt Ratio (p.p.)		7,3	-6,0	-0,5	1,3	3,0	3,1	
of which:								
Primary Fiscal Deficit (% of GDP)		2,3	-5,0	-0,7	-0,5	-0,2	0,0	
Other Net Financing Needs (% of GDP)		1,8	3,4	1,2	1,2	1,2	1,2	
Recognition of Contingent Liabilities (% of GDP)		0,0	0,0	0,0	0,0	1,8	1,7	
Valuation Effect (% of GDP)		5,5	-2,9	0,0	1,3	0,7	0,7	
Contribution of Interest-Growth Diff. (p.p.)		-2,3	-1,6	-1,0	-0,7	-0,4	-0,4	
of which:								
Contrib. of Real Interest Rate (p.p.)		-2,3	-0,7	-0,2	0,1	0,1	0,1	
Contrib. of Real GDP Growth (p.p.)		0,0	-0,9	-0,8	-0,8	-0,4	-0,4	

avge. = average, contrib. = contribution, denom. = denominated, diff. = differential, for. = forecast, GDP = gross domestic product, hist. = historical, p.p. = percentage point, V.E. = valuation effect.
Source: Author.

Table A4. Macroland Government's Fiscal and Financing Data & Public Debt Dynamics. Fiscal-Shock Scenario

	2020 (hist.)	2021 (hist.)	2022 (for.)	2023 (for.)	2024 (for.)	2025 (for.)	2026 (for.)	Assumption Shock
GDP								
GDP at Current Prices (MA\$ million)	250,0	275,0	300,3	324,8	347,9	369,1	391,6	
GDP at Current Prices (% annual growth)	9,2	10,0	9,2	8,2	7,1	6,1	6,1	
GDP at Constant Prices (% annual growth)	3,0	0,0	4,0	4,0	4,0	3,0	3,0	
GDP Deflator (% annual growth)	6,0	10,0	5,0	4,0	3,0	3,0	3,0	
Exchange Rates								
Exchange Rate at end-of-year (MA\$ per US\$)	2,0	3,0	2,5	2,5	2,7	2,8	2,9	

	2020 (hist.)	2021 (hist.)	2022 (for.)	2023 (for.)	2024 (for.)	2025 (for.)	2026 (for.)	Assumption Shock
Valuation Effects (MA\$ million)								
Valuation Effects		15,0	-8,5	0,0	4,3	2,2	2,4	
V. E. on Initial US\$-denom. Debt Stock		15,0	-7,5	0,0	4,2	2,2	2,3	
V. E. on Net Issuance of US\$-denom. Debt Flow		0,0	-1,0	0,0	0,1	0,0	0,1	
Public Debt Indicators (MA\$ million, unless specified)								
Public Debt Stock at end-of-year (MA\$ million)	100,0	130,0	131,5	151,2	176,7	208,0	241,5	
MA\$-denom. Debt Stock (MA\$ million)	70,0	85,0	81,5	98,7	117,3	143,6	171,9	
US\$-denom. Debt Stock (US\$ million)	15,0	15,0	20,0	21,0	22,0	23,0	24,0	
Public Debt Ratio: Level								
Public Debt Ratio (Debt Stock as % of GDP)	40,0	47,3	43,8	46,6	50,8	56,3	61,7	
Public Debt Ratio: Annual Variation & Contributions (I)								
Annual Variation in Public Debt Ratio (p.p.)		7,3	-3,5	2,8	4,2	5,6	5,3	
of which:								
Annual Variation in Debt Stock (% of GDP)		10,9	0,5	6,1	7,3	8,5	8,6	
Contribution of Nominal GDP Growth (p.p.)		-3,6	-4,0	-3,3	-3,1	-2,9	-3,2	
Public Debt Ratio: Annual Variation & Contributions (III)								
Annual Variation in Public Debt Ratio (p.p.)		7,3	-3,5	2,8	4,2	5,6	5,3	
of which:								
Primary Fiscal Deficit (% of GDP)		2,3	-1,5	3,5	3,5	3,5	3,5	
Other Net Financing Needs (% of GDP)		1,8	3,3	1,2	1,2	1,2	1,2	
Recognition of Contingent Liabilities (% of GDP)		0,0	0,0	0,0	0,0	1,6	1,5	
Valuation Effect (% of GDP)		5,5	-2,8	0,0	1,2	0,6	0,6	
Contribution of Interest-Growth Diff. (p.p.)		-2,3	-2,4	-1,9	-1,6	-1,3	-1,4	
of which:								
Contrib. of Real Interest Rate (p.p.)		-2,3	-0,7	-0,2	0,1	0,1	0,2	
Contrib. of Real GDP Growth (p.p.)		0,0	-1,7	-1,6	-1,7	-1,4	-1,6	

avge. = average, contrib. = contribution, denom. = denominated, diff. = differential, for. = forecast, GDP = gross domestic product, hist. = historical, p.p. = percentage point, V.E. = valuation effect.

Source: Author.

Table A5. Macroland Government's Fiscal and Financing Data & Public Debt Dynamics. Long-Term Scenarios

	2020 (hist.)	2021 (hist.)	2022 (for.)	2023 (for.)	2024 (for.)	2025 (for.)	2026 (for.)	"Baseline PB is -0.4% of GDP I-G Diff. is -1%" Long-Term Values	"Higher PB PB is 0.6% of GDP I-G Diff. is -1%" Long-Term Values	"Lower PB PB is -1.4% of GDP I-G Diff. is -1%" Long-Term Values	"Higher I-G Diff. PB is -0.4% of GDP I-G Diff. is 2%" Long-Term Values	"Higher PB & I-G Diff. PB is 0.6% of GDP I-G Diff. is 2%" Long-Term Values
GDP												
GDP at Current Prices (MA\$ million)	250,0	275,0	300,3	324,8	347,9	369,1	391,6					
GDP at Current Prices (% annual growth)	9,2	10,0	9,2	8,2	7,1	6,1	6,1	4,0	4,0	4,0	1,0	1,0
GDP at Constant Prices (% annual growth)	3,0	0,0	4,0	4,0	4,0	3,0	3,0	3,0	3,0	3,0	0,0	0,0
GDP Deflator (% annual growth)	6,0	10,0	5,0	4,0	3,0	3,0	3,0	1,0	1,0	1,0	1,0	1,0
Exchange Rates												
Exchange Rate at end-of-year (MA\$ per US\$)	2,0	3,0	2,5	2,5	2,7	2,8	2,9	Constant	Constant	Constant	Constant	Constant
Exchange Rate average-during-year (MA\$ per US\$)	2,0	2,5	2,7	2,5	2,6	2,8	2,9	Constant	Constant	Constant	Constant	Constant
Interest Rates on Public Debt												
Avg. Interest Rate on MA\$-denom. Debt (%)	4,0	4,0	4,5	4,5	4,0	4,0	4,0	3,0	3,0	3,0	3,0	3,0
Avg. Interest Rate on US\$-denom. Debt (%)	2,0	2,0	2,0	2,0	2,0	2,0	2,0	3,0	3,0	3,0	3,0	3,0
Fiscal & Financing Indicators (% of GDP)												
Revenues	10,0	7,3	13,3	12,3	12,3	12,3	12,3	12,6	13,6	11,6	12,6	13,6
Primary Expenditures	8,8	9,6	6,8	10,8	10,8	10,8	10,8	13,0	13,0	13,0	13,0	13,0
Primary Fiscal Balance	1,2	-2,3	6,5	1,5	1,5	1,5	1,5	-0,4	0,6	-1,4	-0,4	0,6
Financing Needs	4,0	3,6	3,3	3,3	3,3	3,3	3,3	3,0	3,0	3,0	3,0	3,0
Financing Sources	2,0	1,8	0,0	2,2	2,2	2,2	2,2	3,0	3,0	3,0	3,0	3,0
Other Net Financing Needs	2,0	1,8	3,3	1,2	1,2	1,2	1,2	0,0	0,0	0,0	0,0	0,0
Contingent Liabilities (% of GDP)												
Recognition of Contingent Liabilities	0,0	0,0	0,0	0,0	0,0	1,6	1,5	0,0	0,0	0,0	0,0	0,0
Valuation Effects (% of GDP)												
Valuation Effects		5,5	-2,8	0,0	1,2	0,6	0,6	0,0	0,0	0,0	0,0	0,0

avge. = average, denom. = denominated, for. = forecast, GDP = gross domestic product, hist. = historical, I-G diff. = interest-growth differential, PB = primary balance, p.p. = percentage point.

Source: Author

Chapter 2

Formulating a Debt Management Strategy

Antonio Velandia

Abstract

Public debt management is the process of preparing and executing a strategy for managing the government's debt to cover funding needs at a minimum cost with a prudent degree of risk and promote the development of an efficient market for government securities (World Bank and IMF 2014, 11). The chapter uses country examples to show that such strategies are expressed through risk indicators and offers an overview of the analytical framework underpinning decision-making. The framework calls for a clear understanding of cost-risk trade-offs, the impact on and from monetary and fiscal policies and the effects of government borrowing on the pace at which the domestic debt market develops. Public debt is the most extensive portfolio in most countries, so its size and composition greatly influence the financial market.

2.1. Introduction

Public debt management strategies are vital instruments that governments use to reduce their financial vulnerability to domestic and external shocks. The tequila crisis in 1994, the Russian Federation's default in 1998 and Argentina's default in 2001 all featured poor composition of government debt portfolios. Decisions were driven, in some cases, by excessive focus on cost savings associated with short-term debt and, in others, by excessive reliance on foreign-currency debt. The unbalanced debt structures exposed governments to interest and exchange rate shocks that triggered or aggravated full-blown economic crises.

Having a strategy in place is paramount, given that the public debt portfolio is usually the country's largest financial portfolio. Developing economies tend to be more vulnerable to shocks, less diversified, have a smaller base of domestic savings and less developed financial systems and are more exposed to capital flows.

A debt management strategy is relevant for infrastructure financing because it involves substantial amounts, and loans are denominated in foreign currency. If terms are not carefully selected, the borrower risks hitting the government budget with larger-than-expected outflows when debt service payments come due.

From the lender's perspective, understanding a borrower's debt management strategy helps tailor lending operations to suit the client's needs, including selecting a currency, a redemption schedule or an interest-rate type that minimizes vulnerability and, therefore, risk for both parties. The strategy should be part of the creditor's know-your-client due diligence.

The chapter helps readers understand (1) the concept of debt management strategy, (2) risk indicators and the concepts of cost, risk and cost-risk trade-offs and (3) the linkages between a debt management strategy and macroeconomic policies.

Section 2 presents a government debt management strategy and its main components, section 3 focuses on risk indicators as the key elements used to express a strategy, section 4 presents the notions of cost and risk and the methodology for quantifying cost-risk trade-offs and section 5 discusses the links between the macroeconomic framework and the debt management strategy.

2.2. A Debt Management Strategy: What It Looks Like in Practice

A debt management strategy is a plan to attain a composition of a government debt portfolio that can best cover funding needs at the lowest possible cost, consistent with a prudent degree of risk. Such a composition reflects the government's preferences regarding cost and risk and is pursued over the medium term (World Bank and IMF 2019). The strategy serves as a borrowing guide for the next few years.

The debt management strategy allows the government to choose between alternative borrowing mixes that offer difficult trade-offs. For instance, a six-month treasury bill (T-bill) may have a lower interest rate than a five-year treasury bond but is significantly exposed to interest rate and refinancing risks. Similarly, foreign-currency securities may have lower coupons than local-currency ones but are exposed to the volatility of exchange rates. By setting a desired portfolio with a defined composition by currency, redemption profile, interest rate and instrument type, the strategy allows the debt manager to make these trade-offs.

2.2.1. Latvia and Bhutan: Illustrations of a debt management strategy

The following examples show that debt management strategies are centered on managing the costs and risk exposures embedded in the government debt portfolio, with attention to potential variations in debt-servicing costs that can substantially impact the government budget.

Latvia's public debt management strategy is expressed as a set of quantitative targets for exposure to market and refinancing risks and minimum issuance of government securities for the domestic debt market. Latvia is a high-income country⁵⁶ that joined the European Monetary Union in 2014 and uses the euro as its local currency. Latvia's debt/gross domestic product ratio is projected to approach 50% in 2022.

Table 2.1 shows that Latvia is not comfortable with foreign-currency exposure. Caps on the share of debt maturing in one and three years control for exposure to refinancing risk, while a floor set on the share of fixed-rate debt and a band for duration limit the exposure to interest-rate risk. Cost is minimized mainly through the selection of tenor and interest-rate type. The strategy reflects authorities' commitment to maintaining a minimum supply of government securities in the local market to ensure access to the funding source while enabling the proper functioning of the domestic financial market.

Table 2.1. Public Debt Management Strategy in Latvia 2021

Variable to Control	Indicator	Target	Deviations
Refinancing exposure	Share of debt maturing within 1 year	Maximum 25%	
	Share of debt maturing within 3 years	Maximum 50%	
Interest-rate exposure	Share of fixed rate debt	Minimum 60%	
	Macauley duration	5-9 years	
Currency exposure	Net debt currency composition	100% euro	+/- 5%
Supply of government securities in the local market	Total placement of GoS in a 5-year period	Not less than stock of GoS at start of period	

GoS = government securities.

Source: Latvia Ministry of Finance (2021).

⁵⁶ See the country classification by income level in Hamadeh Nada et al. (2021) and the evolution of Latvia's gross national income per capita from the World Bank (2022).

Bhutan provides another example of a well-structured strategy for managing government debt. Bhutan is classified as a lower-middle-income country (Hamadeh et al. 2021). Its debt to GDP ratio borders 120% and is mainly denominated in foreign currencies. Bhutan's strategy is based on three main principles: (1) minimize cost by borrowing from concessional windows as much as possible, (2) promote market development by covering part of the funding needs with government securities and (3) limit foreign-currency exposure by keeping external debt burden indicators under the limits prescribed by the 2016 Public Debt Policy. The principles are translated into quantitative targets (Table 2.2).

Table 2.2. Public Debt Management Strategy in Bhutan 2021

Variable to Control	Indicator	Target
Funding cost	Concessional financing to Gross financing needs ratio	60-80%
Interest-rate exposure	Share of fixed-rate debt	Minimum 95%
Supply of government securities in local currency	Domestic financing to Gross financing needs ratio	20-40%
	Use auctions for placement of government securities	
Cash management	Use treasury bills primarily for cash management, not deficit financing	

Source: Bhutan Ministry of Finance (2021).

Bhutan prioritizes controlling funding costs and the gradual steps required to increase local currency borrowing. Lacking access to significant local-currency funding, the country must first minimize costs in foreign-currency borrowing by tapping concessional windows, such as bilateral donors or multilateral banks. That is why the first strategic target sets a floor on the ratio of concessional financing to gross financing needs. Regarding developing a domestic debt market, Bhutan is taking small steps early: implementing auctions and establishing a floor on the ratio of domestic financing to gross financing needs.

The two examples show that strategies are expressed differently from country to country, reflecting their development stage and borrowing choices. In Bhutan, more than 95% of the government's debt is external, partly because the domestic financial market is small. Maximizing funding at concessional terms makes sense, providing low interest rates, long tenors and amortizing structures. Latvia does not need or want to borrow in foreign currencies; its strategy focuses on controlling refinancing and interest-rate risks while ensuring adequate functioning of the domestic market for government securities. In short, while Bhutan prioritizes reducing its funding costs, Latvia's strategy centers on managing interest rate and refinancing risks.

Most debt management offices (DMOs) worldwide use formal strategies to manage government debt. A 2017 survey found that out of 117 countries, 60% had a formal debt management strategy in place. Most used targets supported by quantitative analysis and publicized their strategies (Cabral Rodrigo 2015). The use of strategies is a critical indicator in the World Bank's Debt Management Performance Assessment, a tool that benchmarks the soundness of debt management practices across countries (World Bank 2021).

2.2.2. How to construct a debt management strategy

Constructing a debt management strategy can be broken down into eight steps as follows:⁵⁷

Step 1: Identify the debt management objectives and determine the scope of the strategy. The objectives are usually expressed as finding a composition of a debt portfolio that provides the lowest expected cost and is resilient to a range of shocks to interest and exchange rates. The scope starts with the central government debt and may include subnationals' and state-owned enterprises' obligations, depending on the country's legal and institutional arrangements.

Step 2: Identify the current debt management strategy, the outstanding debt and its composition and the basic cost and market risk indicators. The step is the point of departure of the analysis, for it reflects detailed information on outstanding debt, including its debt-servicing profile and a description of the main portfolio risks.

Step 3: Identify potential sources of finance with their financial characteristics, including cost and risk parameters. The step defines what is feasible regarding borrowing as reflected in a list of all existing domestic and external instruments, including their financial characteristics and the amounts that could be raised.

Step 4: Describe the macroeconomic and market environment. The step produces the main prices for the scenario analysis: baseline projections for key fiscal, monetary policy and market variables and a clear and comprehensive set of country-specific risk scenarios to be tested.

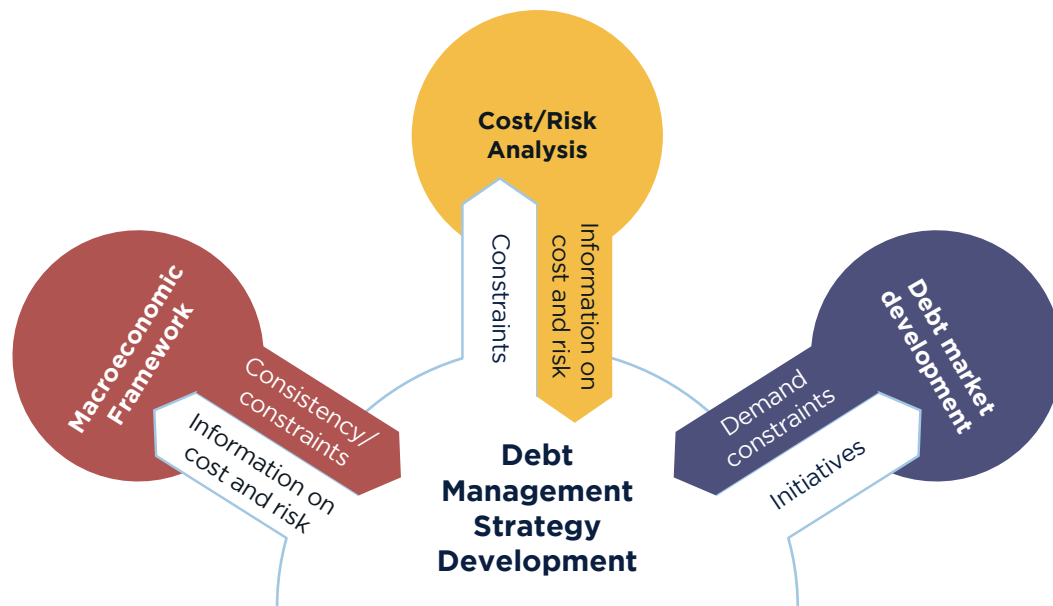
Step 5: Review structural factors that could influence the desired direction of the strategy. The strategy should articulate factors such as commodity price vulnerability, pension reform or change in access to concessional financing as income levels grow.

Step 6: Identify and analyze possible borrowing strategies, assess their performance, and choose a few preferred debt management strategies. This analysis compares feasible debt compositions, identifying preferences relative to objectives, the preferred strategy and a few alternatives.

Step 7: Ensure consistency with the macroeconomic policies and market development plans. The step requires getting feedback from the fiscal and monetary policy authorities and reviewing the strategies' potential debt market implications. The selected strategies should maintain debt sustainability and align with plans for market development.

Step 8: Present the preferred and alternative strategies to the highest responsible authority and propose the preferred strategy for approval. The debt manager produces a document describing the preferred strategy, a few alternatives and a clear description of the key associated costs, risks and relationships with the broad objectives.

⁵⁷ For a detailed discussion of these steps, see World Bank and IMF (2019), 11-24.

Figure 2.1. Factors Determining the Design of a Debt Management Strategy

Source: The World Bank – Designing Government Debt Management Strategies Workshop 2019.

2.2.3. Implementation of a debt management strategy

After approval, the debt management strategy should be published on the ministry or DMO website and shared with key stakeholders such as parliament, primary dealers, creditors, investors and ratings agencies (World Bank and IMF 2019, 24-25). Transparency of the debt management strategy benefits all parties: the DMO gains because it secures political commitment, which facilitates its decision-making; investors benefit since knowledge about the DMO's intentions reduces uncertainty and the associated risk premium of debt instruments; and high-level authorities, including parliament, receive a reference point to evaluate debt management performance and make the debt manager accountable.

The first step towards implementation is for the DMO to draft an annual borrowing plan (World Bank and IMF 2019, 25-27) that is consistent with the strategy. The plan should determine the gross borrowing needs for each type of instrument to cover not only the budgetary and rollover needs but also additional requirements coming from cash management.

DMOs regularly monitor the annual borrowing plan quarterly to evaluate their progress in implementing the debt management strategy. Countries review the debt management strategy annually or more often if macroeconomic or market conditions change significantly.

2.3. Risk Management: Indicators and Practices

Debt management strategies are plans to manage the risks affecting the government debt portfolio and are expressed in terms of risk indicators. We explain the different types of risks and how they can be managed. We start with defining and quantifying each type of risk, measure exposures through risk indicators and end with techniques debt managers use to mitigate exposures, accompanied by practical examples.

2.3.1. Refinancing risk

Refinancing risk is the danger that debt will have to be rolled over at an unusually high cost or, in extreme cases, cannot be rolled over at all (World Bank and IMF 2014, 18). Refinancing risk occurs when debt comes due and threatens countries with fiscal deficits or insufficient surpluses to cover principal repayments.

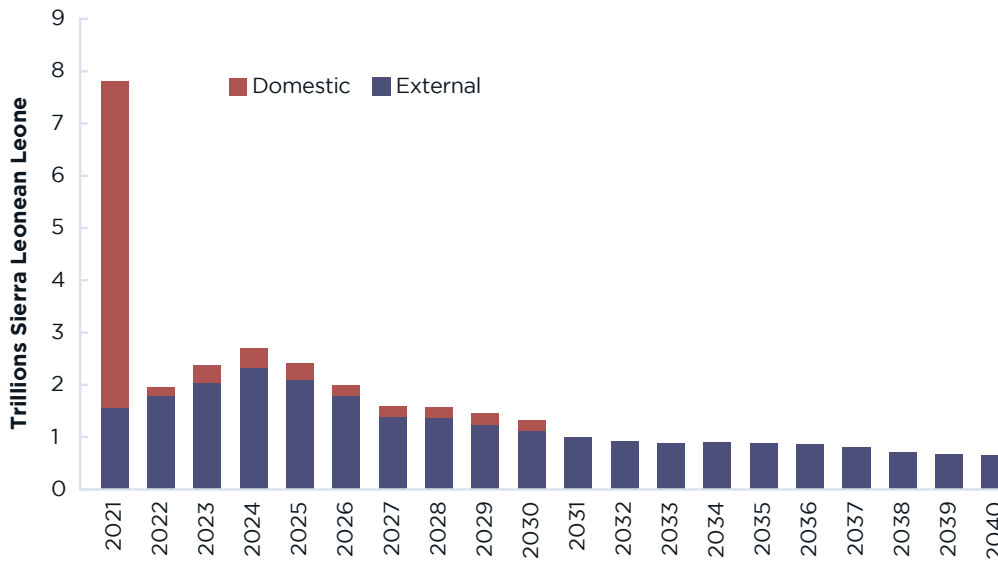
Refinancing risk equals the debt to be refinanced multiplied by the potential increase in the interest rate at the time of refinancing. Since the potential for refinancing problems is not the same across all debt instruments, the risk of each instrument should be quantified separately. For instance, commercial and concessional borrowing in foreign currencies have different refinancing exposures. While commercial borrowing will likely evaporate during global financial turmoil, access to concessional windows from multilaterals such as the IMF or the World Bank may continue or even increase during crises. If interest-rate volatility is significantly different across currencies, a separate calculation for refinancing risk is warranted:

Refinancing risk = Debt to be refinanced x Potential increase in interest rates (1)

The public debt manager's decisions influence both factors in calculating refinancing risk. If debts are contracted so that redemptions accumulate at a given point, the likelihood of financiers requiring higher interest rates for new lending may increase: quantity and price would become linked.

Exposure to refinancing risk can be calculated through (1) the shape of the redemption profile, (2) the share of debt falling due within the first year and (3) the average time to maturity (ATM). Large spikes in the redemption profile suggest vulnerability to refinancing shocks in specific periods, while the share of debt falling due in year 1 measures the degree of concentration affecting refinancing in the short term. ATM shows, on average, the time the DMO needs to refinance its debt portfolio; the longer the ATM, the lower the frequency of refinancing and the less likely the portfolio's exposure to that type of risk.

The redemption profile describes the moments when debt will have to be repaid. For many developing countries, the picture for domestic debt is extremely different from that of external debt. In Sierra Leone, the domestic debt profile is highly concentrated in the exceedingly short term, while their external debt shows a smooth redemption profile (Figure 2.2).

Figure 2.2. Redemption Profile in Sierra Leone as of the End of 2020

Source: Sierra Leone Ministry of Finance.

For Sierra Leone, domestic debt falling due within one year is an appropriate indicator of refinancing risk. With redemptions of SLL6.2 trillion in 2021, an increase of 1% in the local interest rate would increase budget expenditures by SLL0.9 trillion, which is about 2% of GDP and 10% of government revenues.⁵⁸ More than 70% of the domestic debt maturing within one year is clearly a worrisome source of vulnerability for the government budget.

ATM is computed as the weighted average of the time to maturity of all individual loans and securities that comprise the government debt portfolio. Tracking the indicator allows an observer to judge whether the debt manager is extending or shortening the redemption profile. However, as an average, the indicator cannot detect whether refinancing problems are imminent. Expression (2) shows the calculation of ATM:

$$ATM_{t=0} = \frac{\sum_{t=1}^T A_t \cdot t}{\sum_{t=1}^T A_t} \quad (2)$$

where ATM_t is the average time to maturity of the debt portfolio at time $t=0$, and A_t is the t period principal payment in the portfolio. The sum of A_t in the denominator equals the stock of debt at $t=0$.

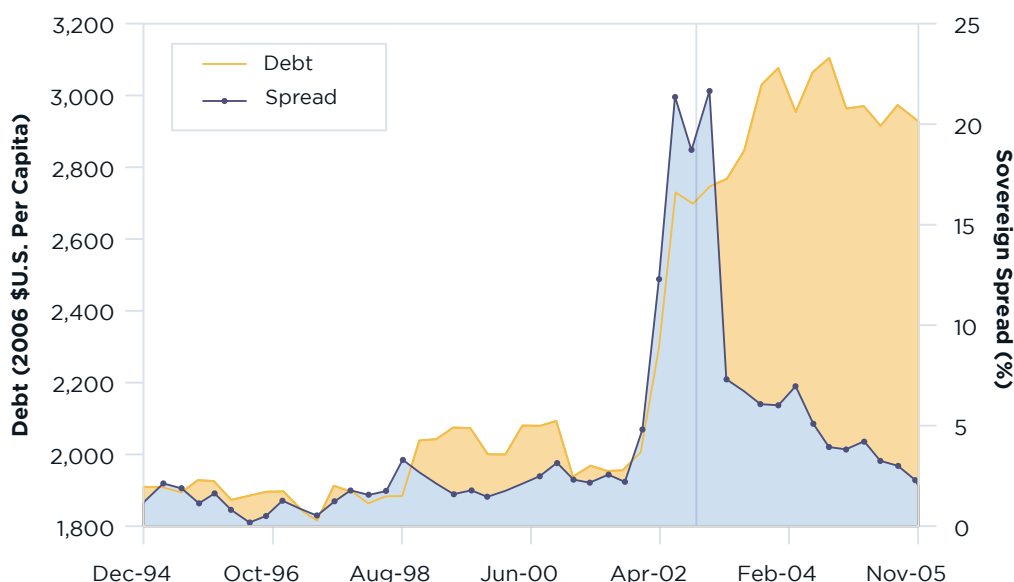
The three indicators provide different information and should be used together. The share of debt falling due in year 1 alerts authorities to potential problems coming up soon but ignores refinancing vulnerabilities from year 2 onward. These problems can be detected by the redemption profile. ATM cannot detect refinancing issues in specific years but provides a summary measure of the refinancing profile of the entire debt portfolio.

⁵⁸ While less than a third of Sierra Leone's debt stock as of the end of 2020 was denominated in local currency, interest payments in 2021 were 3.8 times those of foreign currency debt. This shows the abysmal difference between the low concessional rates of IFI loans and the extremely high interest rates of local currency obligations. For the complete strategy document, see Sierra Leone, Ministry of Finance 2022.

Typical tools to mitigate refinancing exposure include (1) avoiding concentration of future repayments, (2) establishing prudential limits to exposure indicators, (3) issuing bonds with amortizing structures (although undesirable for liquidity purposes), (4) extending average maturity during favorable times, (5) diversifying borrowing sources, (6) tapping market sources in good times and saving concessional credit lines for bad times, (7) maintaining a liquidity cushion (despite the cost of carry), and, if possible, (8) keeping treasury bills and floating-rate and inflation-linked bonds in the issuance program.⁵⁹ DMOs with no access to debt buybacks and exchanges can only smooth out the redemption profile through the borrowing program. The restriction is not problematic when governments contract multilateral loans that offer long-term amortizing structures. Still, it becomes challenging with domestic instruments, especially if the investor base comprises mainly commercial banks. Debt managers operating in deep markets frequently transact buybacks and exchanges to deal with issuance concentrated in a few benchmark securities that create large spikes in the redemption profile. Instead of leaving the benchmark securities in the market until maturity, debt managers repurchase them or exchange them for other securities a year or two before they come due.

Uruguay offers one of the best examples of how to manage refinancing risk. Argentina's default in 2001 triggered a sudden stop in foreign capital inflows, which affected Uruguay, a neighboring country with highly correlated business cycles. While Uruguay's refinancing needs were not especially large in 2003, the country barely escaped a default (see the spike in the country risk in Figure 2.3) and a bank run thanks to a joint rescue package provided by the IMF, the World Bank and the Inter-American Development Bank. After that episode, the authorities decided to prioritize mitigating refinancing risk.

Figure 2.3. Uruguay Foreign Exchange Debt and Spread over United States Treasury Bills

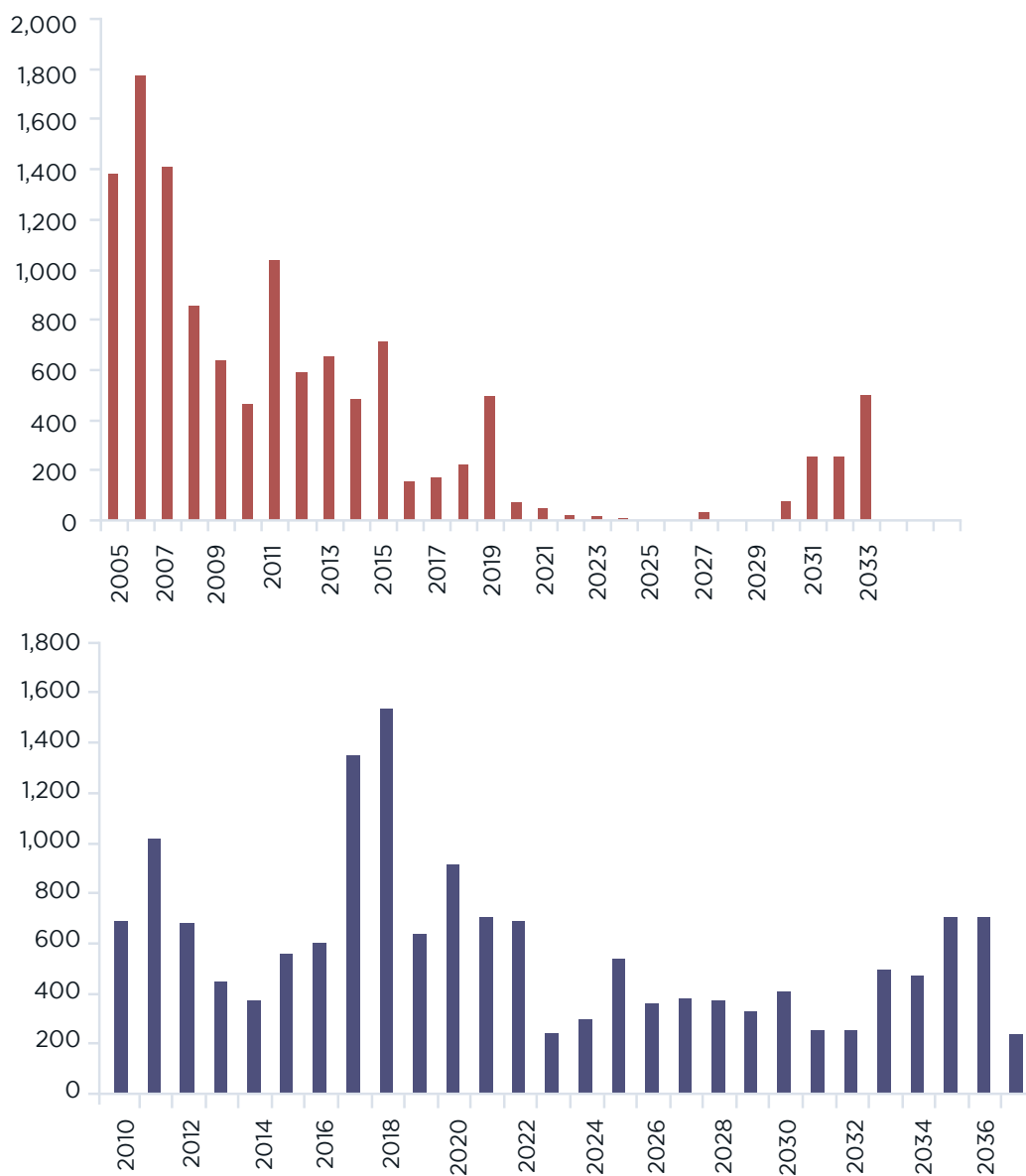


Source: Hatchondo and Martinez 2010.

⁵⁹ In times of market turbulence, investors tend to look for safe and liquid instruments and stay away from those that pose more exposure to a rise in interest rates or inflation. Short-term instruments such as T-bills provide such protection as they quickly adjust to higher interest rates and allow investors to cash them in if need be. Floating-rate instruments protect against rising interest rates, although they can be less liquid than T-bills. Finally, inflation linkers protect investors against sudden outbursts of inflation, such as those occurring after the pandemic.

In the mid-2000s, the government of Uruguay embarked on a series of operations to smooth out its redemption profile. Within six years, the amount of debt to be refinanced within one year dropped from about 8% to 2.5% of GDP and the profile flattened dramatically (Figure 2.4). The drop was made possible by extending the maturity profile and entering liability management operations where short-term debt was exchanged for longer-term debt. The authorities decided to hold a cash buffer equal to nine months of debt payments, protecting the country from a 90% reversal in capital inflows. The development of the domestic debt market helped reduce dependence on Eurobonds, which were more prone to refinancing shocks.

Figure 2.4. Change in Uruguay's Redemption Profile, 2004-2010



Source: Uruguay Ministry of Economy and Finance (2022).

2.3.2. Interest-rate risk

Interest-rate risk is the likelihood of increases in the cost of servicing debt because of rises in market interest rates. It refers to the vulnerability of the debt portfolio at the point where the interest rate on variable-rate debt is re-fixed or fixed-rate debt is refinanced.

Interest-rate risk is equal to the debt whose interest rate is resetting multiplied by the potential increase in the interest rate at the time of reset. The first term is portfolio exposure and comprises two components: existing debt contracted at floating rates and fixed-rate debt that falls due and needs to be rolled over. The risk factor refers to the volatility of interest rates.

Interest-rate risk = Debt to reset the rate x Potential increase in interest rates (3)

Since a debt portfolio can have multiple interest-rate types, interest-rate risk should be calculated separately for the sub-portfolios. A separate calculation applies to borrowing from multilaterals versus commercial borrowing and commercial borrowing by currency. For instance, the potential increase of United States (US) dollar interest rates after the coronavirus disease (COVID-19) pandemic could be far greater than that of yen interest rates.

The two main indicators of exposure to interest-rate risk are (1) the share of debt in the portfolio with interest-rate refixing within a given period and (2) the average time to refix (ATR). The two indicators offer complementary information and should be used together.

The share of debt with interest-rate refixing within a given period (typically a year) is the percentage of the total outstanding debt whose interest rate will be reset over that period. The selection of the period should reflect the portfolio structure: for instance, if a significant portion of the government debt is contracted in T-bills at tenors shorter than one year, debt managers may want to measure the share of debt whose interest rate will be refixed within the next three or six months, in addition to measuring the exposure annually.

ATR measures, on average, the time until the entire government debt portfolio changes its interest rate. The longer the ATR, the less frequently changes in market interest rates impact the government debt portfolio; in contrast, a short ATM driven by a large share of floating-rate or short-term fixed-rate debt reveals a government debt portfolio highly sensitive to movements in interest rates. Expression (4) shows the calculation of ATR:

$$ATR_{t=0} = \frac{\sum_{t=1}^T A_t \cdot t}{\sum_{t=1}^T A_t} \quad (4)$$

where ATR_t is the average time to refix debt portfolio at time $t=0$, and A_t is the amount of principal resetting the interest rate at period t . The summation of A_t in

the denominator is equal to the stock of debt at $t=0$.⁶⁰ The mix of fixed- to floating-rate debt gives an incomplete image of portfolio exposure to interest-rate risk, particularly for debt portfolios with a substantial position of short-term fixed-rate debt. For instance, a government debt portfolio comprising exclusively T-bills and no floating-rate instruments will have a large exposure to interest-rate risk even though all debt is contracted at fixed rates.

Some countries use the Macaulay Duration as an indicator of exposure to interest-rate risk. Like ATR, the Macaulay Duration provides a weighted average of the time until the interest rate of a debt portfolio resets. However, while ATR uses the principal payments over nominal outstanding debt as weights, the Macaulay Duration uses the share of the present value of cash flows—including principal and interest payments—over the present value of the debt portfolio. The main problem of duration is that it changes with the discount rate without any action from the debt manager. Duration shortens when the discount rate increases, inducing the debt manager to extend maturities precisely when doing so is more costly.

The overlap of refinancing and interest-rate risk results in using similar tools to mitigate the exposure to both. Interest-rate risk emanating from the bunching up of redemptions of fixed-rate debt can be avoided by (1) implementing a borrowing program and prudential limits that reduce the concentration of future repayments, (2) extending ATR in favorable times, (3) diversifying funding sources and investor types, (4) using market sources in good times and saving contingent credit lines for bad times and (5) maintaining a liquidity cushion (despite the cost of carry) to avoid issuing debt under tough market conditions.

If the exposure originates in excessive accumulation of floating-rate debt, interest-rate swaps help reduce such exposure. However, the swaps may not be accessible to all countries, sometimes because they do not have the necessary legal tools and sometimes because private financiers cannot offer them at a reasonable cost. Nonetheless, multilateral institutions such as the World Bank can intermediate those products at a much lower cost without needing borrowers to post collateral.

The Czech Republic offers a good example of the evolution of managing interest-rate risk, the country's most important risk according to its DMO.⁶¹ The Czech Republic aimed first to reduce to 33% the share of T-bills, which, by 2000, represented 60% of government debt. In 2003, the authorities introduced a band for the Macaulay Duration to be kept between three and four years. The duration was replaced by interest-rate refixing within one year in 2006, and the indicator was complemented with ATR in 2011.⁶²

By 2008, the authorities have made substantial progress in reducing exposure to interest rates, as witnessed in the sharp fall of debt refinancing in one year (Figure 2.5).

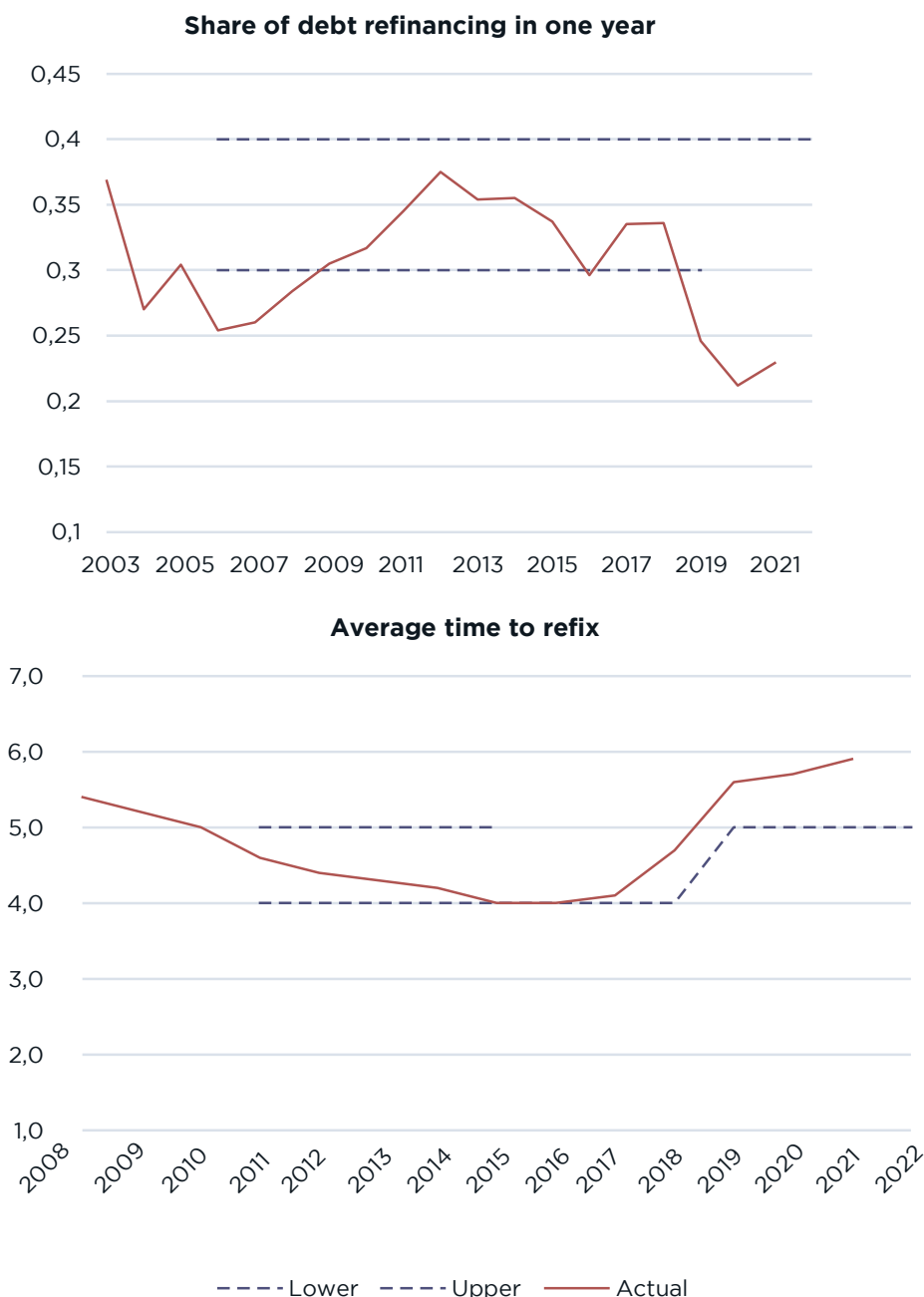
60 Equations (2) and (4) are the same since ATM and ATR are both weighted averages. However, while for ATM A_t is the principal payment at time t , for ATR A_t represents the principal whose interest rate resets at time t ; these two are different for floating-rate cash flows. Suppose a debt portfolio comprises a single instrument—a floating-rate note (FRN) in an amount of 100 maturing in 10 years and resetting its rate every year—the portfolio ATM would be 10 years. However, since the FRN changes the rate yearly, ATR would be one year.

61 The Czech Republic DMO maintains an easy-to-consult website comprising annual debt management strategies since 2006.

62 Since 2014, the DMO has used cost at risk to determine the maximum interest expenditure on state debt that should not be exceeded, with 95-99% probability.

A more comfortable fiscal position after 2008 until 2016 permitted a policy reversal to prioritize cost reduction, as reflected in the reduction of ATR and the increase in debt refinancing in one year. The policy reversed again in 2017. The risk assessment led the authorities to reduce the exposure to interest-rate risk by once again increasing ATR and reducing the share of debt refinancing in one year.⁶³

Figure 2.5. Management of Interest-Rate Risk in the Czech Republic



Source: Czech Republic Ministry of Finance.

63 The changes in the policy are signaled by the targets set for the indicators in the strategy. ATR was set in 2011 at a four-to-five-year band and was replaced by a four-year floor in 2016; the floor was raised in 2019 to five years. In 2022, an ATR band was reinstated at five to six years. The band for the share of debt refinancing in one year set at 30-40% in 2006 was revised after 2019 when the actual value of the indicator fell below the floor; the band was replaced by a ceiling of 40% in 2020.

Exchange rate or foreign-currency risk is the chance of increases in the cost of debt arising from changes in exchange rates. Debt denominated in or indexed to foreign currencies adds volatility to debt-servicing costs as measured in domestic currency owing to movements in the exchange rate (World Bank and IMF 2014, 18). Unlike refinancing and interest-rate risks, exchange rate risk affects the debt-servicing flows and the debt stock, which is why many developing countries consider it the largest risk.⁶⁴

To compute exchange-rate risk, the relevant exposure is multiplied by the volatility of the price of the foreign currency. From the flow perspective, foreign-currency risk equals the amount of the debt service flows denominated in each foreign currency multiplied by the volatility of the relevant exchange rate. From the stock perspective, however, foreign-currency risk is the outstanding debt denominated in each currency multiplied by the volatility of the relevant exchange rate. Since exchange-rate volatility differs for every currency pair, risk should be calculated separately for sub-portfolios in each foreign currency.

FX risk on debt stock_{*i*} = Net debt stock_{*i*} x risk factor_{*i*} (5)

FX risk on debt serving flows_{*i*} = Debt servicing flows_{*i*} x risk factor_{*i*} (6)

where the subindex *i* denotes the foreign currency.

The most common measures of exposure to foreign-currency risk include (1) share of foreign-currency debt in the total debt portfolio, (2) ratio of short-term foreign-currency debt to foreign reserves and (3) composition of foreign-currency debt.

The share of foreign-currency debt provides a first glance at foreign-exchange exposure. A portfolio with a small share of foreign-currency debt will have little exposure to exchange-rate risk even if the volatility of exchange rates is substantial. By contrast, a portfolio with a substantial share of foreign currencies can seriously deteriorate the government's financial condition even with a relatively small exchange-rate depreciation.

That indicator, however, does not provide information on how time-pressing the exposure is. The impact of an exchange rate shock is very different if the foreign-currency debt were maturing soon than if the exposure were spread across a long horizon. The ratio of short-term foreign-exchange debt to foreign-exchange reserves is a better option than our first indicator for capturing the time dimension of the foreign-exchange exposure. For instance, a small ratio would indicate that the country could comfortably meet its short-term obligations even if the local currency depreciated or capital inflows suddenly stopped.

A complementary exposure indicator is the composition of foreign-currency debt. Some countries choose to denominate foreign-exchange debt in US dollars because the monetary authority targets the US dollar exchange rate; others prefer the euro because of closer economic and political links with the eurozone. In most cases,

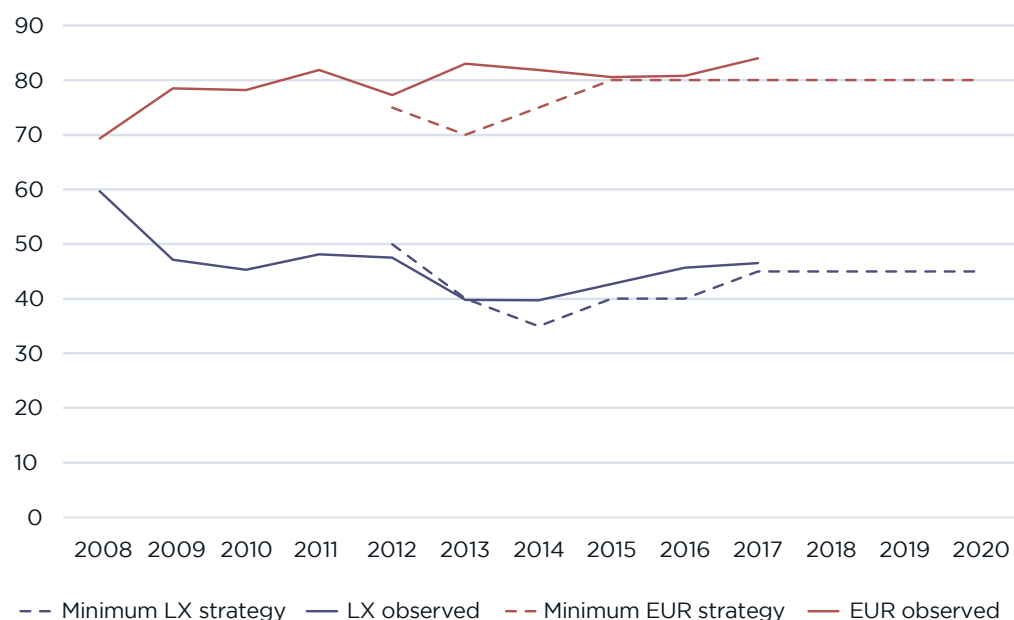
⁶⁴ The impact of exchange rate movements on the debt stock is not exclusive to foreign-currency debt instruments. Changes in the inflation rate may affect the stock of inflation-linked bonds in countries that apply accrual accounting to the inflation uplift.

the volatility of the local currency differs against the US dollar, euro or yen, and these differences should be reflected in the selection of currency mix of the foreign-exchange debt.

The main tool to mitigate foreign-exchange exposure is to develop the local debt market. Natural hedges (such as commodity exports) and liability management operations (chapter 4) are other tools. The deepening and broadening of the domestic debt market allow debt managers to increase financing in local currency and reduce reliance on foreign-exchange debt. Countries that are strong commodity exporters can use revenues in foreign exchange to hedge the exposure arising from their foreign-exchange liabilities.

Regarding strategy, DMOs first determine the share of foreign-exchange debt and then its currency composition. That share is the residual of what the debt manager can issue in local currency, which will largely depend on the absorption capacity of the domestic market: the larger and deeper it is, the less the need to rely on foreign-currency financing. The currency composition of foreign-currency debt should be designed to reduce the variability of debt service flows measured in local currency. For example, if the central bank targets its intervention at the price of the US dollar, the volatility of the US dollar against the local currency is likely to be lower than that of other foreign currencies. Consequently, the US dollar should have a large share in the foreign-exchange debt portfolio.

Figure 2.6. Monitoring Foreign-Currency Risk in Romania



EUR = euro, LX = local currency.

Source: Romania Ministry of Finance.

Romania offers an example of managing foreign-exchange risk as an integral part of a government debt management strategy (Figure 2.6).⁶⁵ Romania is part of the European Union and expects to replace the local currency with the euro at some point in the future. The DMO started producing a debt management strategy in 2012 and uses two indicators to manage foreign-currency risk: a floor for the share of local-currency debt and a floor for the share of euro-denominated debt over foreign-exchange debt. The minimum share for the local currency has dropped twice since it was broken in 2013; since 2017, the floor has remained constant at 45%. The minimum share of the euro in the foreign-exchange portfolio has remained at 80% since 2015, and the actual ratio has remained above the floor all along.

2.4. Cost and Risk Analysis

Since the strategy is a means to attain the debt management objectives, which are stated in terms of minimizing the funding cost and keeping risk tolerable, debt managers need to be clear about how to measure cost and risk. Cost refers to the debt-servicing charges generated by the government debt outstanding. At the same time, risk is defined as the unexpected increase in debt-servicing costs due to changes in interest or exchange rates. The measure of risk is intrinsically linked to that of cost. Cost and risk have several measures, and debt managers are advised to use a variety of measures to ensure that all appropriate dimensions are captured. The relevance and choice of specific measures will be country-specific and may change over time.

2.4.1. Concepts and measurement of cost risk

Most countries express their government debt management objectives in terms of minimizing the funding cost and keeping risk tolerable. For instance, Thailand (Thailand Public Debt Management Office 2022), Georgia (Ministry of Finance of Georgia 2019) and Kyrgyzstan (Kyrgyz Republic Ministry of Finance 2020) build their debt management strategies around the primary objective of financing the government at the lowest possible cost, subject to keeping risk at a level acceptable to the authorities. Debt managers need to be clear about how to measure cost and risk.

The concept of cost relates to debt-servicing flows that align with the debt manager's expectations. Barring surprises in interest- and exchange-rate behavior, the principal and interest payments will match budget projections. Cost is associated with cash flows. Risk is associated with negative budget effects of unexpected and undesirable changes in the debt-servicing flows resulting from unanticipated increases in interest rates or from the fall in the value of the local currency.

Since debt-servicing flows can be denominated in several currencies and extend over a long horizon, a fundamental question for measuring cost and risk refers to

⁶⁵ Since 2011, Romania's debt management strategy has been updated every three years. Strategy documents are available at the Ministry of Finance website.

the metrics: In what currency should debt-service flows be measured and over what time horizon? To answer the question, we need to identify the sources used by the government to service its debt: mainly tax revenues, denominated in local currency and relatively inelastic or negatively correlated to short-term interest rates. Cost and risk, therefore, should be measured in local currency over a medium- to long-term horizon.

The proposed metric can be explained in terms of stocks, using a simplified balance sheet in which the sovereign's only liability is government debt and only asset the present value of government future fiscal surpluses. If surpluses are denominated in local currency and not positively correlated to short-term interest rates, then the best way to immunize the sovereign against interest- and exchange-rate shocks is to issue medium- to long-term fixed-rate debt denominated in local currency. Cost and risk should be measured in local currency over a medium- to long-term horizon.

Once the metric for measuring cost and risk has been clarified, the next question is what should be included in the debt-servicing flows. If all debt instruments are fixed or floating-rate coupon securities denominated in local currency, then interest payments will correctly capture the bulk of the debt cost. However, countries issue debt in foreign exchange indexed to inflation and zero-coupon securities, and in all cases, part of the cost is paid by adjusting the principal. In consequence, cost measures should include, in addition to interest payments, the increase in the principal due to changes in exchange rates, inflation and securities sold below par.

Unfortunately for many DMOs, capturing the adjustment of the principal due to the abovementioned factors is not feasible. The reason may be limitations of the debt management system or accounting practices. A solution is complementing cash flow with stock-type measures. The debt stock solves some of the former shortcomings, such as allowing capture of foreign-exchange impact on the debt portfolio. When comparing alternative debt strategies, the debt manager must measure the impact of changes in the exchange rate on the debt stock as part of the cost.

Whether cash flow or stock cost measures are chosen, real rather than nominal values should be employed since the comparison of alternative strategies spans several years. Nominal cash flows or nominal debt stocks can be deflated using inflation indexes to compare data across various years. A better option is to scale the nominal figures by government revenue or GDP to understand the magnitude of the cost relative to government income or the economy's size.

Appropriate cost and related risk measures could include (1) nominal interest payments as a percentage of budget revenues or over GDP, (2) nominal interest payments plus unrealized capital gains and losses over budget revenues or over GDP and (3) nominal outstanding debt over GDP. Different cost measures provide different information on cost, and debt managers are advised not to rely on any one cost measure and at least combine a flow and a stock measure.

2.4.2. Scenario analysis model

Once they have selected cost-risk measures, debt managers must compare alternative borrowing strategies. The comparison is not always straightforward, as strategies attractive from a cost standpoint may pose unacceptable levels of risk. The cost-risk trade-offs occur because low-cost instruments, such as T-bills or foreign-currency loans, are more exposed to the abovementioned risks than more costly instruments, such as long-term fixed-rate securities in local currency.

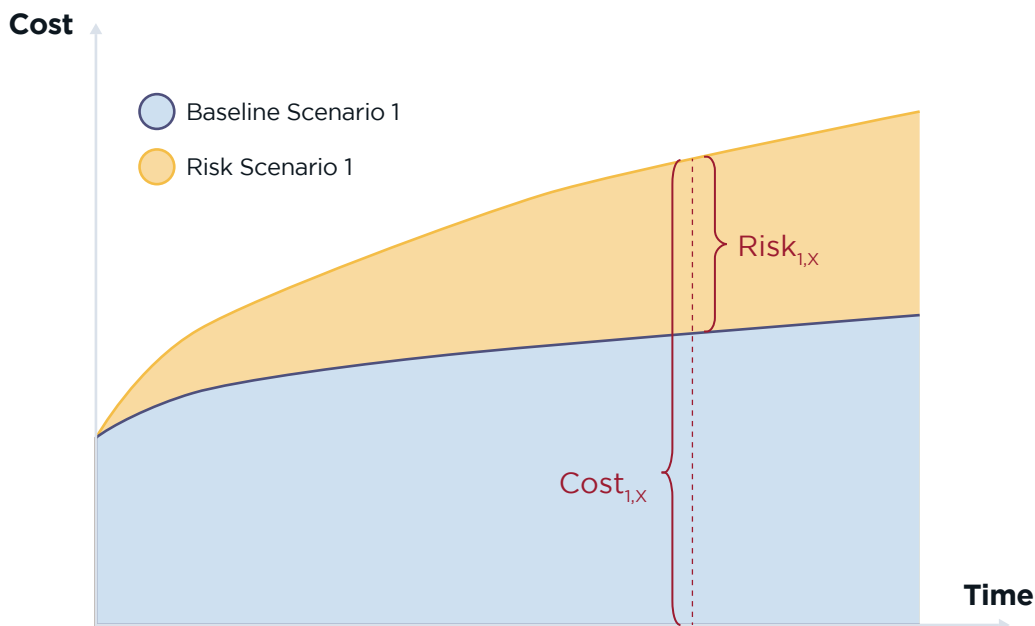
To decide on cost-risk trade-offs, debt managers use quantitative models. The models use scenario analysis—deterministic or stochastic—to simulate how alternative debt management strategies perform under baseline and risk scenarios for interest and exchange rates. Their output provides useful inputs that complement—not replace—other qualitative analyses.

The models are a cash-flow simulation engine that reproduces the annual budget process. For the first year ($t = 1$), the borrowing requirements are the sum of amortization and interest payments plus the primary budget balance; both are known at $t = 0$, and the funding gap is filled using a given strategy, such as a combination of 10-year US dollar bonds and one-year local-currency bills. For the second year ($t = 2$), the debt service adds the service of the debt contracted in year 1—that is, the rollover of one-year bills issued in $t = 1$ and the coupon on the 10-year bond—to the debt-servicing flows of the debt stock outstanding at $t = 0$. The funding requirements at $t = 2$ are the sum of the estimated primary deficit and the debt service generated by the model. The funding gap is filled following the same strategy of 10-year US dollar bonds and one-year local-currency bills. The process continues iteratively until the end of the selected period: for example, five years.

Since the portfolio includes foreign- and local-currency instruments issued at fixed and floating rates, assumptions on future exchange rates and yield curves must be fed from the start. The rates are needed to compute the debt service of the instruments issued on $t = 1, 2, \dots, n$. The model is run with a baseline scenario of interest and exchange rates to provide a cost estimate that can be expressed in terms of the debt-servicing flows or the stock. When the model is run with a shock to interest or exchange rates, the resulting increase in debt-servicing flows or stocks provides an estimate of the risk of the strategy under analysis: in this case, the 10-year US dollar bonds and one-year local-currency bills (Figure 2.7).

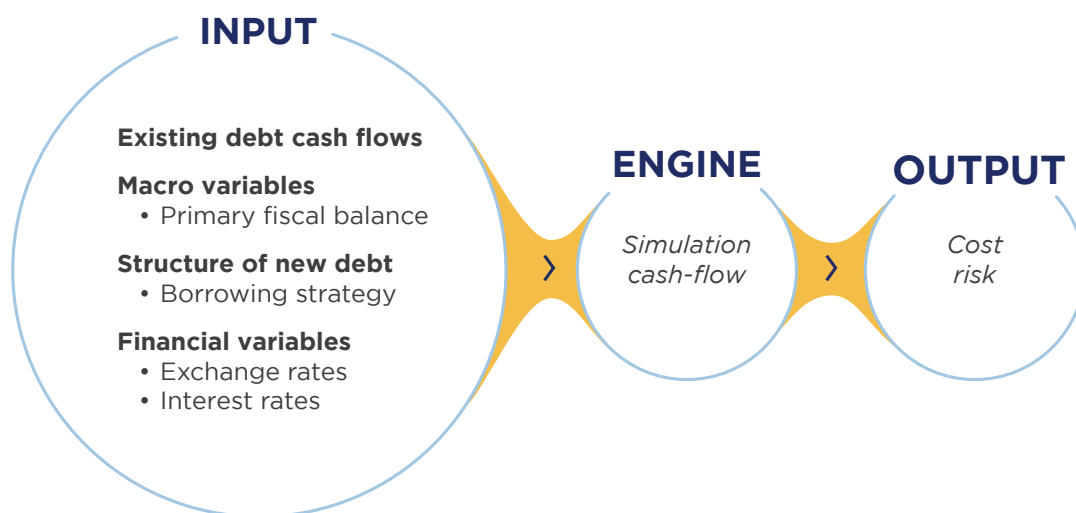
The same process is followed for alternative debt management strategies, for which the model estimates cost and risk that can be compared with those of the initial strategy. The structure of the scenario analysis model is simple: the model needs inputs for (1) principal and interest cash flows of existing debt, (2) the primary deficit for each year of the horizon and (3) the borrowing strategy in terms of the instruments to be used and prices, i.e., interest and exchange rates (Figure 2.8). The information allows the model to compute each year's debt flows and produce the results at the end of the selected period. The model's outputs are the cost and risk for the selected strategies.

Figure 2.7. Illustration of Debt-Servicing Flows of a Strategy under a Baseline and a Risk Scenario



Source: The World Bank – Designing Government Debt Management Strategies Workshop 2019.

Figure 2.8. Structure of a Simulation Model to Compute a Debt Management Strategy’s Cost and Risk

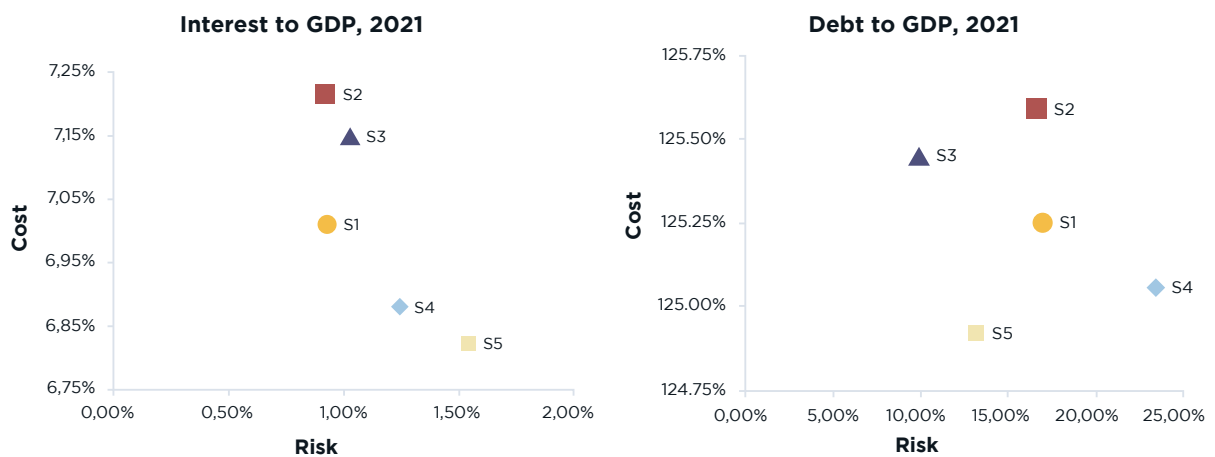


Source: World Bank (2019).

Simulating the different strategies under the baseline and risk scenarios allows debt managers to measure cost-risk trade-offs, which is fundamental to their decisions regarding the desired composition of the government debt portfolio. Figure 2.9 shows examples of the cost and risk of several strategies compared in terms of a cost-flow measure, interest payments over GDP, and a cost-stock measure, debt over GDP.⁶⁶ On the left-hand side, strategies with low risk, such as S2 and S3 are relatively expensive, more than 7% of GDP, compared with strategy S5, which is cheaper, about 6.8% of GDP. But S5 bears higher risk: under a shock, its cost increases by 1.5% of GDP versus S2 and S3, whose response to the shock is only 1% of GDP. On the right-hand side, S5 looks superior to S1, S2 and S4.; while it is cheaper than S3, it poses higher risk.

Cost-risk trade-offs could be simple to make when the selected strategies are aligned alongside a relatively flat or a low sloped line. In this case, debt managers can substantially reduce risk with a relatively small increase in funding cost. In contrast, when strategies are located along a steeply sloped line, risk reduction is too expensive and may need to be more attractive to the fiscal authorities.

Figure 2.9. Illustration of Cost and Risk of Alternative Debt Management Strategies



GDP = gross domestic product.

Source: World Bank (2019).

While models are helpful, not every DMO needs one, especially at the beginning of the process. Several countries, including Indonesia, Colombia and the Czech Republic, started managing their debt portfolios without quantitative models partly because the main exposures were easy to identify, and so were the risk mitigation measures that needed to be adopted. Nonetheless, once that stage is passed and the borrowing choices multiply, debt managers find it more challenging to make the trade-offs. At that stage, a model is a useful tool to support decision-making. The following section discusses the salient issues of risk modeling.

⁶⁶ When using deterministic scenarios, associating risk with the concept of probability is difficult. Debt managers that use deterministic analysis in this model tend to use worst-case scenarios to visualize the cost-risk trade-offs but avoid assigning probabilities to individual risk scenarios. The association of risk with the probability distribution of debt-servicing flows requires moving to stochastic analysis based on the probability distribution of interest and exchange rates. **Cost at risk** is an example of a stochastic measure of risk.

2.4.3. Scenario analysis model

Risk models offer important benefits to the debt manager by allowing the analysis of multiple scenarios and strategies. Such an analysis is far more difficult without a quantitative tool. For instance, scenario simulation could be useful for debt managers in emerging markets to check the potential impact of the recent US Federal Reserve monetary policy change on strategies with different local-foreign-currency mixes. Comparing the potential increase in debt service among different strategies helps monitor the risk of the government debt portfolio and review strategies to alter risk.

A key advantage of models is that they offer a framework that maintains conceptual integrity across different scenarios and strategies. The projection of the primary deficit and the cash flows of the existing debt are the same for all borrowing strategies, and so are the baseline and risk scenarios for interest and exchange rates. The model gives a sense of neutrality and objectivity to the comparison because the differences in output are due exclusively to the borrowing mix.

Modeling deepens the debt manager's insights. After numerous iterations, the debt manager will become familiar with the key sources of exposure and the more relevant cost-risk trade-offs and then can focus efforts on variables more relevant to strategy selection. For instance, if local interest rates are the critical factor, the debt manager may dedicate more time to modeling the domestic yield curve to quantify the cost of extending ATM or the risk of not doing so.

A first prerequisite for modeling is a good debt database. The DMO needs high-quality and timely data on the outstanding debt portfolio. The debt management system should produce interest and principal cash flows that can be easily aggregated to facilitate the analysis. Debt data should be complete, reliable and up to date; otherwise, the analysis' output could be misleading.

Modeling requires dedicated staff with good knowledge of spreadsheets and finance. Strategy design and modeling fall under the responsibility of the middle office, whose staff should have a solid understanding of microeconomics and macroeconomics and a medium to advanced level of financial mathematics and be conversant in Excel and Visual Basic or other programming tools. Building a scenario analysis model represents a considerable investment of DMO resources, but it can pay back handsomely, taking the whole debt management practice to a higher level.

One of the hardest challenges for a scenario analysis model is the selection of market variable scenarios. The quality of the cost-risk analysis depends largely on the selection of scenarios in deterministic models and the selection of parameters in stochastic models. While history offers a basis for constructing scenarios in both cases, economies frequently live through periods of instability that render the design of paths for interest and exchange rates more difficult.

Practice in DMOs shows that models are not the main basis for decision-making, only part of it. Rather, scenario analysis models supplement debt managers' experience and sound judgment by providing additional information to make better choices.

The main contribution of the models is the expanded knowledge of the cost-risk trade-offs, which are at the center of the selection of the borrowing mix. By forcing debt managers to look systematically into the future, scenario analysis helps clarify the decision-making framework.

2.5. Macroeconomy and Debt Management Strategy

2.5.1. Linkages of debt management and macroeconomic policy

In the 1980s, debt management emerged as a separate public policy in small Organisation for Economic Co-operation and Development economies that faced severe fiscal imbalances and high-risk portfolios. New Zealand, Belgium, Ireland and Portugal, among others, adopted legal and structural organizations like those of financial institutions capable of managing high-risk portfolios with liability management operations and derivatives. Semiautonomous entities within or reporting to the ministry of finance were controlled with proper governance arrangements, including formulating clear debt management objectives defined by the legislature. Since the 1980s, these institutional arrangements have become sound international practice.

Separating debt management and macroeconomic policy does not mean they are independent. Close interdependencies tie debt management and monetary and fiscal policies. The choice of borrowing strategies impacts the main macroeconomic aggregates and key prices, such as interest and exchange rates and inflation. The interaction runs both ways since fiscal and monetary policies can modify the funding needs and the same key prices, affecting the cost and risk of government debt.

Lax monetary policy leading to high inflation expectations could undermine the DMO's ability to issue medium- to long-term fixed-rate instruments. For instance, a high inflation-risk premium on conventional bonds may force debt managers to rely on foreign-currency securities or, if borrowing in local currency, restrict them to short-term and floating-rate instruments. Similarly, government debt structures heavily reliant on foreign-exchange, short-term or floating-rate instruments make it more difficult for the central bank to adjust the exchange or interest rate as needed.

To the extent that investor sentiment turns negative, a lax fiscal policy may restrict the debt manager's choices. A loose fiscal stance could cast doubt on the government's capacity to meet all debt obligations on time, which would most certainly increase the credit risk premium and the government's funding cost. Similarly, government debt structures heavily reliant on foreign-exchange or short-term instruments may trigger a serious imbalance in government fiscal accounts if risks materialize.

The examples illustrate the strong linkages between debt management and macroeconomic policies and make a solid case for high-level coordination, which can take the form of the debt manager requesting comments from the monetary authority and the fiscal policy unit on the draft strategy (see step 7 in section 2.2).

2.5.2. Macroeconomic considerations when building a debt management strategy

The most important inputs from fiscal policy to the strategy are the baseline and the risk scenarios for fiscal projections. The projection of funding needs should be based on projections of economic growth and primary balance produced by the fiscal authority in its medium-term fiscal framework. The inputs are an integral part of the fiscal sustainability analysis, which is key for determining government tolerance to risk.

A key concern for the debt manager is the estimate of funding needs and its potential to be above the authority's expectations. An unexpected increase in funding needs requires the debt manager to source financing at short notice, which could prove challenging if markets are closed or the absorptive capacity of the domestic market is limited. When funding is sought under pressure, the debt manager may have to accept terms that it would not otherwise.

To deal with unexpected increases in funding needs, the debt manager has a battery of resources that should be incorporated into the strategy. Diversifying funding sources mitigates the dependence on a given market or instrument that may not be available when needed.⁶⁷ Domestic market development deepens and broadens the debt manager's access to local currency financing, which is more reliable in times of crisis. Minimizing refinancing risk by smoothing the redemption profile makes it less likely that an unexpected increase in funding needs will coincide with a peak in redemptions. All those measures may cost, and the cost could be incorporated into the budget, including the cost of market development.

The main input of monetary policy to strategy design is the projection of domestic interest and exchange rates. Monetary policy is the anchor of the yield curve, with short-term rates reflecting the central bank's stance. Exchange rates are influenced by interest rates and by the central bank's policy on foreign reserve accumulation.

The exchange-rate regime has strong implications for assessing foreign-exchange debt risk and overall risk tolerance. In a floating exchange-rate regime, the nominal exchange rate can be volatile while the real exchange rate tends to be stable. In contrast, in a managed regime, nominal exchange rates are more stable but require central bank intervention to sterilize capital inflows with lower interest rates and outflows with higher interest rates. If the exchange-rate regime is fixed, greater primary surpluses, lower debt levels and higher risk aversion will be required. Other things equal, a fixed-rate regime has less room than a floating one for foreign exchange debt.

Lastly, local-currency, long-term, fixed-rate debt is more desirable in countries where the central bank's ability to rein in inflation and keep the local currency's value stable is under scrutiny.

⁶⁷ T-bills, for instance, proved to be excellent shock absorbers in developed economies during the COVID-19 crisis, when demand for other instruments contracted abruptly.

2.5.3. Macroeconomic shocks: Implications for a debt management strategy

The economy's vulnerability to external shocks affects the debt portfolio and funding needs and must be considered when drafting the debt management strategy. For example, countries exposed to demand shocks are better off integrating inflation-linked bonds into their debt strategies. During negative shocks, economic activity contracts, driving down government revenues, but the debt service also drops, thanks to lower inflation. The positive correlation between inflation and growth makes inflation linkers act as a shock absorber.⁶⁸ Based on a similar analysis, the New Zealand DMO transformed the composition of the Crown's debt portfolio (Hagan 2016), increasing the share of linkers from 2% in 2012 to 23% in 2019.⁶⁹

Emerging markets are exposed to various shocks that impact the economy differently and require specific responses from the debt manager. Table 2.3 summarizes the shocks, their impact and potential debt manager responses. Let us see, for example, what happens when capital flows suddenly stop. Sudden capital outflows generate (1) pressures on the exchange rate that the central bank may try to resist by raising interest rates and (2) an imbalance in the balance of payments and a potential contraction of imports unless more foreign-currency borrowing is raised. The larger the share of foreign-exchange and short-term or floating-rate debt, the worse the impact on fiscal accounts and the risk that debt management might amplify the shock.

Table 2.3. Macroeconomic Risks and Debt Management Strategies

Macroeconomic factors	Source of vulnerability	Impact	Implication for debt management strategy
1. Fiscal risk			
Revenue	Growth slowdown	Increasing financing needs and higher debt	Diversify funding sources and domestic market development
Expenditure	Growth slowdown Contingent liabilities Natural disaster		Minimize refinancing risk so that large principal redemptions do not coincide with large and sudden increases in fiscal deficits Weather related hedge
2. Monetary risk			
Inflation	Pass-through from depreciation Food and fuel price Credibility of monetary policy	Pressure on exchange rate and interest rate	Manage trade-off between higher cost of domestic debt and lower cost, higher risk foreign currency debt
3. Balance of payments risk			
Current account	Terms of trade shock Remittance Tourism	Pressure on exchange rate and interest rate, need to borrow for BOP support	Maximize concessional borrowing while managing aid volatility
Capital account	FDI/Private capital flow International reserves Aid volatility		Domestic debt market development

Source: IMF 2019.

⁶⁸ In contrast, conventional bonds work better than inflation linkers when the economy is exposed to supply shocks because the negative correlation between inflation and growth makes inflation linkers augment the impact of the shock. During inflationary outbursts, the debt service of inflation linkers increases right when government revenues are contracting, worsening the government's financial condition.

⁶⁹ New Zealand Treasury 2020.

A deep domestic debt market that allows the debt manager to sell medium- and long-term conventional or inflation-linked instruments will help mitigate the shock. Access to contingent lines or regular borrowing facilities from multilaterals can help temporarily absorb the shocks. In good times, DMOs can leave some unused space with multilaterals that can be used as a shock absorber during turbulent times.

While trying to predict the timing or nature of shocks or the cyclicity of capital flows is unrealistic, the debt strategy should promote a portfolio unlikely to amplify shocks. A common strategy is to maximize the issuance of long-term fixed-rate debt in domestic currency and to smooth out the debt servicing over time. Debt managers should reduce risk during good times by prefinancing (increasing financial assets) or buying back debt close to maturity, increasing the share of domestic-currency debt and extending the maturity profile. All those actions will reduce portfolio vulnerability during bad times. Effective debt management during turbulent times is difficult and risk reduction can be too costly if government debt approaches unsustainability.

2.6. Conclusion

A debt management strategy targets a desired composition of the government debt portfolio. The strategy's design responds to the need to attain debt management objectives expressed as the need to fund the government at the lowest possible cost, keep risk under control and promote the development of the domestic debt market. The strategy is expressed in terms of targets for selected indicators of debt portfolio exposure to market and refinancing risks, together with plans to achieve the targets. The plans usually involve regular borrowing and, if available, liability management operations and swaps.

Countries that successfully formulate a debt management strategy start with clear definitions of cost and risk and use simple scenario analysis to quantify difficult cost-risk trade-offs and support borrowing choices. These countries are transparent and share their draft strategy documents with the monetary and fiscal authorities to ensure high-level policy consistency. Successful strategies can play a major role in a government's plan to develop the domestic debt market.

Lenders offering flexible financial conditions help borrowers select the most convenient amortization schedule, interest-rate characteristics and currency denomination aligned with borrowers' debt management strategies.

References

- Bhutan Ministry of Finance. 2021. Medium-Term Debt Management Strategy: 2020/21 to 2022/23. March 30, 2021.
- Cabral, Rodrigo. 2015. How Strategically is Public Debt Being Managed Around the Globe? A Survey on Public Debt Management Strategies. World Bank, Washington, DC. March 2015.
- Czech Republic Ministry of Finance. 2022. Funding and Debt Management Strategy.
- Hamadeh, Nada, Catherine van Rompaey, and Metreau Eric. 2021. New World Bank Country Classifications by Income Level: 2021-2022. *World Bank Blogs*. World Bank, Washington, DC. July.
- Hagan, Andrew. 2016. Sovereign Asset and Liability Management: The New Zealand Experience. Presentation at the 2016 World Bank Sovereign Debt Management Forum.
- Hatchondo, Juan Carlos and Leonardo Martinez. 2010. The Politics of Sovereign Defaults. *FED Richmond, Economic Quarterly* 96 (3) (third quarter): 291-317.
- Kyrgyz Republic Ministry of Finance. 2020. Public Debt Management Strategy of the Kyrgyz Republic for 2020-2023 — Ministry news — Ministry of Finance of the Kyrgyz Republic (minfin.gov.kg).
- Latvia Ministry of Finance. 2021. Central Government Debt and Cash Management Strategy. Jan. 15.
- Ministry of Finance of Georgia. 2019. General Government Debt Management Strategy: 2019-2021. February.
- New Zealand Treasury. 2020. Government Bonds on Issue (at Month End).
- Romania Ministry of Public Finance. 2022. Government Public Debt Management Strategy, 2011-2018.
- Sierra Leone, Ministry of Finance. 2022. Medium-Term Debt Management Strategy.
- Thailand Public Debt Management Office, Ministry of Finance. 2022.
- Uruguay Ministry of Economy and Finance, Sovereign Debt Management Unit. 2022. Debt Statistics.
- World Bank and International Monetary Fund (IMF). 2014. Revised Guidelines for Public Debt Management. April 1.
- Cabral, Rodrigo. 2019. Developing a Medium-Term Debt Management Strategy Framework (MTDS). Updated Guidance Note for Country Authorities. February.
- World Bank. 2019. Designing Government Debt Management Strategies Workshop 2019. Washington, DC.
- World Bank and International Monetary Fund (IMF). 2022. DataBank. GNI per capita, Atlas method.
- World Bank. 2021. Debt Management Performance Assessment (DeMPA) Methodology.

Chapter 3

Annual Borrowing Plan and Issuance of Debt Instruments

M. Coşkun Cangöz

Abstract

An accurate annual borrowing plan is fundamental to avoid under or overfunding the government and improve market confidence and predictability. The plan balances how much will be borrowed in domestic and foreign debt markets and optimizes the mix of financial instruments to be used while considering market trends and the benchmarks set by the debt strategy. The plan calls for a precise analysis of the investor base and demand for government securities. Strong and stable demand reduces both borrowing costs and the riskiness of public finances in the eyes of investors, creating a self-strengthening loop. Public debt managers count on multiple channels to reach their investor base—such as the primary-dealership system—and multiple ways to broaden and diversify that base at home and abroad. An annual borrowing plan, therefore, should be designed and executed holistically: sources, tools and marketplaces should complement each other as part of a larger cost-risk trade-off.

3.1. Introduction

The annual borrowing plan (ABP) is the main tool for implementing the debt management strategy. The plan determines how much the government needs to borrow in a given year based on expected revenue collection, budget expenditures, debt amortization, refinancing needs and other available means of financing. The plan sets the mix of financial instruments and markets for borrowing and articulates the issuance plan, auction calendar and distribution networks through which government securities will be issued. At the same time, the plan's implementation can be a powerful tool to broaden the investor base and improve liquidity in debt markets, fostering stable demand and competitive pricing.

This chapter discusses implementing a debt management strategy through the development and execution of an ABP. The next section introduces the ABP and explains financing needs and its funding. Section 3 covers the selection of debt instruments and issuance plans. Section 4 briefly describes issuance mechanisms and the role of primary dealers. The role of a diverse investor base in demand for government securities is tackled in section 5. Finally, section 6 describes external debt instruments, infrastructure financing and access to international markets.

3.2. Annual Borrowing Plan

Sound public finance calls for the articulation of a debt management strategy, that is, a rolling medium-term plan outlining how the government will minimize cost in the medium term, consistent with a prudent degree of risk in its funding, while fostering the development of the domestic capital market (World Bank 2017). The ABP is the tool to implement the debt management strategy in any given year and sets the mix and volume of securities to be issued and the calendar of issuances to secure the formation of the selected portfolio structure as determined in the strategy.

Even though some countries have published an ABP over several years, the usual time horizon is one year, and the focus is on the following year's budget period. The ABP is closely linked to the government's overall cash flow and, as such, requires close coordination with the treasury's cash management and the implementation of monetary policy.

An ABP is a high-level summary of government financing, as shown in the case of Uruguay (Box 3.1). However, no standard presentation exists for an ABP, and each country uses its own format. But sound practices indicate that the ABP, at a minimum, should present (1) information on the government's total funding needs, (2) the breakdown of financing across domestic and external capital markets and (3) the expected funding from commercial banks, multilateral development banks and other sources.

Box 3.1. Uruguay: Annual Borrowing Plan

Uruguay's annual borrowing plan (ABP) is relatively plain but contains all the necessary elements. Published by the Sovereign Debt Management Unit of the Ministry of Finance, the ABP is based on the central government's cash flows. It shows the preliminary outcomes of the current year and projected gross financing needs for the program year and includes funding sources.

	2021*	2022*
Financing Needs	4,879	4,288
Primary Deficit ¹	1,146	481
Interest Payments ²	1,514	1,591
Amortizations of Bonds and Loans ³	2,208	1,822
Change in Financial Assets	11	393
Funding Sources		
Disbursements from Multilaterals and Fin. Instit.	659	450
Total Issuance of Market Debt ⁴	4,123	3,714
Other (net) ⁵	98	123
Memo Item: Government Net Indebtedness (GNI)	2,563	1,950

* Preliminary. The sum of the components may differ from the totals due to rounding.

¹ Excludes extraordinary transfers to the public Social Security Trust Fund (SSTF).

² Includes interest payments to the SSTF on its holdings of Central Government debt.

³ For 2022, includes the obligations coming due on a contractual basis and bonds repurchased.

⁴ Includes bonds issued domestically and in international markets.

⁵ Includes exchange rate and market price valuation effects.

Source: Ministry of Economy and Finance.

Table 3.1. Financing Needs

Financing Needs (VI+VII)
I. Primary balance
II. Interest payments
External interest payments
Domestic interest payments
III. Budget balance (I-II)
IV. Advances
V. Deferred payments
VI. Overall balance (III-IV-V)
VII. Principal payments
External debt principal payments
Domestic debt principal payments

Source: Author.

However, in countries like the United Kingdom, the debt management office (DMO) provides a longer-term perspective for gross financing needs and a more detailed breakdown of securities, including "inflation linkers" and retail borrowing. Brazil goes even further by estimating a breakdown of budgetary revenues for debt payments and listing budget expenditures to be paid with proceeds of government bonds conditional on the approval of additional credits by an absolute majority of the National Congress.

Typically, formulating an ABP begins with determining financing needs in the program year, then adding expected financing means. Where the DMO performs

liability management operations (LMOs) to achieve the objectives of the debt management strategy, they should be included in the ABP.

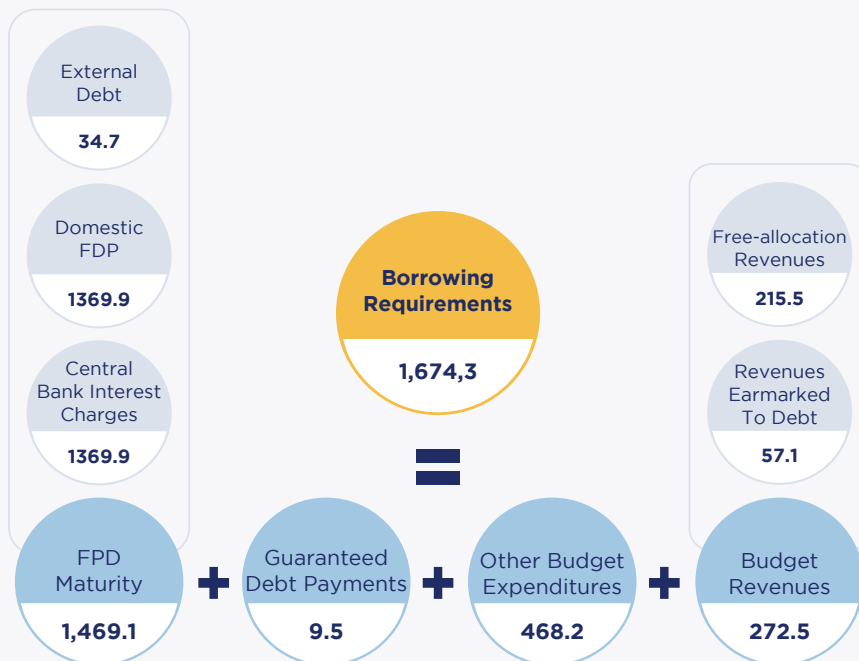
Gross funding need is calculated based on primary balance data obtained from the government budget (Table 3.1). However, some adjustments are needed given that some budget revenues and expenditures do not require cash flows, such as the withholding of tax payments on wages and salaries of public employees withholding tax payments on public employees' wages and salaries. Differences in the timing of accrual and payment of expenditures and the collection of revenues can result in the balance of the government budget differing from that of the treasury's cash flows. DMOs are not only responsible for financing the government budget but also for refinancing outstanding debt. Therefore, debt service payments should be considered when determining financing needs (Box 3.2). If the government's budget is constructed on an accrual basis, however, cash-based financing needs will further deviate due to differences in the recognition of transactions.

Box 3.2. Brazil: Borrowing Requirement

Brazil's approach to calculating the borrowing requirement in the annual borrowing plan parallels the methodology used in the fiscal budget. Only revenues forecast for the current year are considered, not those obtained in previous years, to avoid double counting the same revenue for more than one year. Brazil's borrowing requirement includes the amount to be issued to maintain a certain level of liquidity buffer.

The borrowing requirement comprises debt service payments divided into maturities, nonperforming guaranteed debt payments and noninterest budget expenditures to be paid with debt issuances. The budget revenues intended to pay debt are subtracted from the whole amount.

Borrowing Requirement in 2021 (BRL trillion)



Source: National Treasury (2022).

Given the deviations between budgeted and actual revenues and expenditures, financing needs must be continuously monitored and adjusted. Thus, formulating the ABP requires close coordination with budget execution and cash management. The process further requires debt managers to consider investors' preferences and the external factors that might influence borrowing conditions.

Once financing needs are clear, the DMO must decide the split between external and domestic borrowing (Table 3.2) by considering the following:

1. Preferred composition of aggregated debt, as prescribed by the debt management strategy.
2. Availability of grants and other non-debt financial sources that are not included in budget revenues.
3. Terms and conditions of external loans, availability of credit lines at multilateral financial institutions and access to international capital markets.
4. Balance of the treasury single account and other accounts such as liquidity buffers, contingency funds and sinking funds, as well as target balances for the end of the period.
5. Liquidity conditions in the money market.
6. Market demand for government securities.

The link between financing needs and a borrowing plan is higher in developing and emerging countries. For example, if a specific expenditure is to be financed by a loan from a multilateral, delays in the execution of that expenditure simply reduce financing needs and the borrowing plan by the same amount. In contrast, in advanced economies, where debt markets are developed, financing sources generally have little relationship with expenditures, apart from infrastructure financing in some cases.

High-level targets and cost and risk indicators set by the debt management strategy guide selecting debt instruments, timing and volume of issuances. Usually, debt managers first determine the amount of external financing to be done in the program year, especially if the volume of hard-currency funding available is constrained by, say, low credit ratings. But cash flows vary significantly across bonds and are fully disbursed when issued; project loans disburse in steps as project implementation proceeds, and program loans may be disbursed partially or fully depending on the achievement of policy targets. Similarly, interest and principal payments and fees may differ across instruments.

Debt managers may have more flexibility in issuing government securities in the local market. However, like external bonds and loans, cash-flow patterns vary across domestic debt instruments. For example, zero-coupon securities are issued at a discount but redeemed on maturity at face value, while coupon securities are issued at a discount, par or premium, pay annual, semiannual or quarterly interest at its par value and are redeemed upon maturity. Like external program loans, domestic loans may be disbursed partially or fully, and payments generally include a portion of outstanding principal and interest.

Table 3.2. Funding Sources

Financing (I+II+III+IV+V)
I. External borrowing
Project finance
Program finance
Capital markets
II. Domestic borrowing
Treasury bills
Bonds
III. Net lending
Lending
(-) Repayment
IV. Other recipes
V. Currency and deposits

Source: Author.

Governments may fund other entities within the public sector (e.g., state-owned enterprises) through on-lending or guarantees. According to international accounting standards and principles of macroeconomic statistics, those transactions are recognized as financing items. Therefore, their netted amount should be part of the ABP.

Governments may resort to cash and deposits as a non-debt source of financing. In some countries, debt managers can access bank overdrafts that may be repaid fully within a calendar year or rolled over. In addition, some proceeds, such as those from the privatization of assets, are not recorded in the budget as revenue but as financing items that should also be considered in calculating overall borrowing needs.

Countries may publish their ABP as a sign of accountability and transparency. The plan assists financial markets by guiding the evolution of fiscal accounts, main assumptions underlying fiscal projections and criteria for assessing debt management performance. The plan forecasts issuances in the domestic market that help investors make better investment decisions. All these make the debt market more attractive to investors and help cut funding costs.

3.3. Issuance Plan and Selection of Debt Instruments

The typical issuance plan is articulated around a calendar for the issuance of marketable government securities. It includes other financial operations the government intends to undertake with its debt securities, such as buybacks and exchanges. The plan is prepared annually, with monthly and weekly breakdowns.

While the issuance plan may cover only one year, the planning horizon of a debt manager is—or should be—longer than that, which is why issuance plans are usually

drafted for consecutive years in addition to the current year. The size and frequency of debt issuances should be reviewed periodically, as market conditions may change and government cash flows may be volatile.

An issuance plan is not only a mix of debt instruments and timing but also a tool to help develop primary and secondary markets for domestic government securities. The plan implies that (1) the government is expected to borrow at market price (to be a price-taker), (2) access to securities is broad, (3) investors are treated fairly and (4) all operations are carried out in a credible, predictable and transparent way (Mu 2007).

The World Bank (2015) has synthesized the steps in constructing an issuance plan:

1. Determine the proportion and breakdown of gross domestic borrowing requirement to be financed by marketable instruments.
2. Select the instruments (type, tenor, timing, currency and interest rate) and set the number and size of issuances for each.
3. Organize the maturities and specify the maturity dates.
4. Develop an auction schedule, organize the auctions and set the auction size.
5. Decide on whether and which LMOs will be carried out.
6. Determine the frequency, format and details of market communications.
7. Review and adjust the issuance plan regularly.

Estimates of the government's gross borrowing needs to be financed in the domestic market must be accurate⁷⁰, not only to avoid excessive or insufficient borrowing but also to set the terms of the issuances and the number of benchmarks to be issued. Therefore, when selecting the types and terms of debt instruments, a debt manager must consider (1) the market's demand and liquidity conditions, (2) historical trends and (3) macroeconomic indicators such as expected growth and inflation. The mix of debt instruments is expected to reflect the government's cost and risk preferences as determined in the debt management strategy.

Similarly, the size and maturities selected in the issuance plan are highly dependent on refinancing risk, a key parameter of the debt management strategy. That risk can be mitigated by setting a target size for each line of securities, liquidity buffers or LMOs. The liquidity needs of the secondary market may be considered given that developing government bond markets is an objective of debt management in many countries, and issuing benchmark securities can improve market liquidity while providing access to a larger investor base.

Inoue (1999) argues average issue size and frequency are negatively correlated. When issues are infrequent, they are larger on average and less fragmented.

⁷⁰ This calls for close coordination with the budget unit, especially if increased financing is due to budgetary deviations. That is why it is usually suggested that a budget update be released in conjunction with the issuance.

Developed countries widely use reopening to increase benchmark size, and the issues effectively break the link. However, the number of issues and the volume outstanding are positively correlated, and the issues are less frequent when the outstanding volume of government securities is small (Figure 3.1).

Figure 3.1. Number of Issues and Outstanding Volume (as of June 2021)



AUS = Australia, CAN = Canada, DEU = Germany, ESP = Spain, FRA = France, GBR = United Kingdom, ITA = Italy, JPN = Japan, KOR = Republic of Korea, USD = United States.

Source: Calculated based on the Organisation for Economic Co-operation and Development's Sovereign Borrowing Outlook.

The size of an issue is not the only parameter to identify a particular government security as a benchmark for the market. Other features count, too: maturity, demand, a coupon that reflects market rates and a target size that is reached quickly before the coupon goes off market (World Bank 2015). Behind those features lie (1) the appetite of institutional investors to invest in government securities, (2) the presence of foreign investors in the market, (3) a well-functioning electronic trading system and (4) the availability of post-trade services provided by international securities depositories.

Organizing the redemption dates of securities is part of developing an issuance plan, not least because it will help debt managers reduce volatility of cash flows and refinancing risk, particularly if debt managers issue benchmarks with standard maturities. Setting redemption dates for each security requires careful evaluation of (1) cash flows associated with government revenues and expenditures, (2) the debt service schedule, (3) liquidity in the money market and (4) remaining maturities of securities with the same or similar tenors. Redemption dates should be chosen to align with planned future issuances and to avoid overlapping with other benchmark issues.

Auctions are the most direct channel for issuing government securities, making auction calendars a central part of the issuance plan. Debt managers simulate

different schedules, seeking to meet the high-level objectives of the debt management strategy and to align auctions with expected redemptions for at least one year forward. Deviations can and do happen—public finance and demand can be unpredictable. Auction calendars are usually announced for only one month or one quarter.

Parallel to issuances in the primary market, LMOs such as debt buybacks and exchanges should be incorporated into the issuance plan because they may tap the same pool of investors. LMOs are widely used in Organisation for Economic Co-operation and Development (OECD) countries to manage refinancing risks and reduce funding costs by issuing on-the-run securities and early redemptions (Table 3.3).

Table 3.3. Liability Management Operations in the Organization for Economic Co-operation and Development Area

	Bond Exchange	Bond Buyback		Bond Exchange	Bond Buyback
1 Australia	●	●	18 Japan	●	●
2 Austria	●	●	19 Korea	NA	NA
3 Belgium	●	●	20 Luxembourg	●	●
4 Canada	●	●	21 Mexico	●	●
5 Chile	●	●	22 Netherlands	●	●
6 Czech Rep.	●	●	23 New Zealand	●	●
7 Denmark	●	●	24 Norway	●	●
8 Estonia	●	●	25 Poland	●	●
9 Finland	●	●	26 Portugal	●	●
10 France	●	●	27 Slovak Rep.	●	●
11 Germany	●	●	28 Slovenia	●	●
12 Greece	●	●	29 Spain	●	●
13 Hungary	●	●	30 Sweden	●	●
14 Iceland	●	●	31 Switzerland	●	●
15 Ireland	●	●	32 Turkey	●	●
16 Israel	●	●	33 UK	●	●
17 Italy	●	●	34 USA	●	●
●	: Conducts buyback/switches				
●	: Do not conduct				
NA	: Not Available				

Source: 2012 Survey on Buyback and Switches by OED WPDM.

Setting target size, frequency of issuances, mix of instruments, coupon rate, currency, and maturity of government securities to be placed in the market requires constant and effective communication with investors. It includes (1) consultation with primary dealers and major investors, (2) disclosure of the ABP and auction calendar, (3) pre- and post-auction announcements and (4) reports on the implementation of the issuance plan. Communication with the central bank at the policy and technical levels and the settlement authority—two critical players in the government securities market infrastructure—is necessary.

3.4. Issuance of Government Securities and the Primary-Dealership System

Government securities are issued and distributed chiefly through **wholesale** distribution networks of banks and other institutional investors. In some countries, some securities have been sold through **retail** distribution networks of post offices, bank branches and internet-based platforms catering directly to individual investors and the nonfinancial sector.

DMOs can use wholesale and retail networks to broaden the investor base and develop the government securities markets. The choice of network is heavily influenced by the maturity of the financial system, issuance volume, characteristics of the debt instrument and the DMO's institutional and technical capacity.

Since the mid-1800s, many countries have established retail debt programs to finance the government deficit and to promote savings. The programs aim to expand and diversify the investor base and promote financial inclusion and literacy. Traditional retail programs (e.g., in China, Pakistan, Bangladesh) have used bank branches and post offices as distribution channels and offered nonmarketable paper bonds and bills, which have slightly higher interest rates than bank deposits. Some programs are gradually being replaced by internet-based ones (e.g., in the United States, Brazil). Overall, although it varies across countries, the size of retail programs has been limited (e.g., as the share of outstanding debt in Hungary [26%], Ireland [15%], Thailand [6.5%] and South Africa [1%]).

In wholesale networks, securities are mostly issued through auctions, syndications, tap sales and private placements. Because maximizing competition in the primary market to reduce the cost of funding is a priority for DMOs, auctions are the most common method for selling government securities; 73% of countries use them, according to a World Bank survey (Mu 2007). But each technique has advantages, and DMOs mix and match them to achieve optimal results (Table 3.4).

Table 3.4. Wholesale Issuance Techniques in the Organisation for Economic Co-operation and Development Area

Issuance Technique	Countries
Auction	Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Türkiye, United Kingdom, United States
Syndication	Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Luxembourg, Mexico, New Zealand, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, United Kingdom
Tap Issues*	Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Israel, Italy, Mexico, Netherlands, Portugal, Slovak Republic, Slovenia, Spain, Sweden, United Kingdom

*Includes reopening of existing securities with auctions rather than a fixed-price or fixed-spread tap.

Source: Organisation for Economic Co-operation and Development (2016); table by author.

Two **auction** techniques are common: uniform price and multiple prices. The difference between them is the application of the cutoff price. In uniform-price auctions, all accepted bidders are charged a price equal to the cutoff price, which, in turn, is the lowest successful bid. In a multiple-price auction, each winning bidder pays the price it bid or the price corresponding to the yield bid. Auctions may be open to all investors or limited to primary dealers (closed auctions). No solution fits all cases, and openness and pricing vary across countries.

Many countries have used **syndication** to minimize placement risk, especially when the pricing of new bond issues is uncertain when they reach the secondary market or when the government bond market is at an early stage of development. Syndication has worked well in small economies such as Slovenia, where long-term bonds are issued through arrangers. The DMO releases a proposal including the amount, maturity and timing. Arrangers build a book of willing buyers and finalize the price the day before issuance.

Tap issuances are another way for DMOs to sell securities. Conventionally, the “tap” refers to issuing securities at a set price or spread for a period. As in some OECD countries, the tap may be used to issue securities from past issuances. While not common, the technique is useful when uncertainty is high and interest rates are volatile.

Finally, some DMOs issue bonds through **private placements** structured to meet the specific needs of banks and institutional investors (e.g., in Türkiye, the Slovak Republic, Spain). Tap issues and private placements may not facilitate price discovery as well as syndications and auctions do (Hashimoto et al. 2021).

The selection of issuance methods depends on many factors (Mu 2007). Prime among them are (1) the type of debt instruments to be issued, (2) the type of investors to be addressed, (3) the sophistication level of financial markets and (4) the country’s general macroeconomic environment (Box 3.3).

Box 3.3. Italy: Variants of Issuance Techniques

Debt managers use variants of issuance techniques and change methodology due to economic developments and market conditions. Italy, as a large issuer, employs a hybrid model where auctions are heavily used.

- **Multiple-price auctions** are used for the issuance of treasury bills. Following the first bid accepted with the lowest yield, all the others allocated in ascending order are accepted until the quantum of bids reaches the amount tendered by the treasury.
- **Uniform-price auctions** are used for bonds maturing between two and 50 years, including fixed-rate, floating and inflation-linked bonds. All accepted bids are auctioned at the same price. The amount issued is determined in a preannounced range, and the treasury sets the price.

Syndication is used for new bonds, including linkers, with a maturity longer than 10 years, either to test the market or to deal with the complexity of the bond’s structure (e.g., issuance of the first BTP (buoni del tesoro poliennali [long-term treasury bond])

- **Private placement** is a reverse-inquire process, where a primary dealer, requested by an institutional investor, asks to buy a specific bond, with some tailored features.

Source: Ministry of Finance of Italy (no date).

Regardless of the issuance method, primary dealers can play a central role in any market-oriented funding strategy. They are financial intermediaries appointed by sovereign issuers to (1) buy, promote and distribute government bonds, (2) “make a market” and (3) support liquidity. Primary dealers can help the government directly or the central bank as the government’s financial agent. Their role varies across countries. In developed countries, where competition among investors is strong and spread over a large geographic area, primary dealers focus on facilitating the distribution of securities across buyers as required by their market-making role. In emerging markets, primary dealers promote developing the domestic debt market as the yield curve is incomplete or not representative and price discovery is weak.

Primary dealers have played an essential role in the government securities market since the United States introduced the system in 1960. Since then, 23 of the 28 European Union countries have established primary-dealership systems. However, in smaller economies such as Croatia, Cyprus, Estonia, Luxembourg and Malta, DMOs prefer syndication over primary dealers because liquidity in debt markets is low. Some developed countries (e.g., Switzerland) do not have primary dealers because they have well-functioning primary markets and active secondary markets. The common feature of their markets is that they are smaller than those of other developed countries, and the market share of foreign investors is large.

An efficient primary-dealership system requires well-defined roles and responsibilities between the DMO and primary dealers. Primary dealers may be tasked to (1) develop the domestic bond market, (2) secure stable demand for government securities, (3) provide liquidity in the secondary market, (4) report on secondary-market trends and (5) provide market intelligence to the DMO.

The debt management literature identifies basic requirements for a well-functioning primary-dealership system (Arnone and Iden 2003, Mu 2007, World Bank 2010):

1. Stable macroeconomic conditions.
2. Adequate legal and supervisory systems.
3. A well-functioning payment system.
4. Government commitment to market-based mechanisms, and interest rates reflecting demand and supply conditions to ensure efficient price discovery.
5. Government commitment to transparent debt management practices and an issuance plan that provides a medium-term investment horizon to market participants.
6. An adequate number of investors and a diversified investor base.
7. An adequately large market to support enough primary dealers to ensure competitive behavior.
8. Sufficiently large outstanding debt to create liquid issues.
9. Government commitment to developing the market.

Legally, the primary-dealership system is a contract that describes the terms and conditions of an agreement between the government and financial corporates. The DMO, representing the sovereign, does not use its power to regulate this relationship. Although the primary dealers are also banks in many countries, DMOs are not responsible for their regulation and supervision.

Primary-dealership contracts involve a mix of obligations and privileges, which may vary across countries. However, there are some universal best practices: primary dealers are obliged to (1) underwrite issuances in the primary market, (2) perform as market makers in the secondary market and (3) report on market conditions and primary-dealership operations. Common privileges granted to primary dealers are (1) exclusive or privileged access to DMOs' primary-market transactions, (2) the exclusive right to submit noncompetitive bids, (3) access to a line of credit or ability to borrow particular issues from the depository and (4) the right to carry the title of primary dealer (Mu 2007, World Bank 2010).

3.5. Investor Base and Demand for Government Securities

Gathering and analyzing information on the investor base is an almost universal practice among OECD countries (OECD 2019). For a good reason: It is a means to assess the market's absorption capacity, resilience of demand for securities during times of stress and opportunities to broaden the spectrum of financiers across investment horizons and risk-return preferences (USAID and Commonwealth 2010).

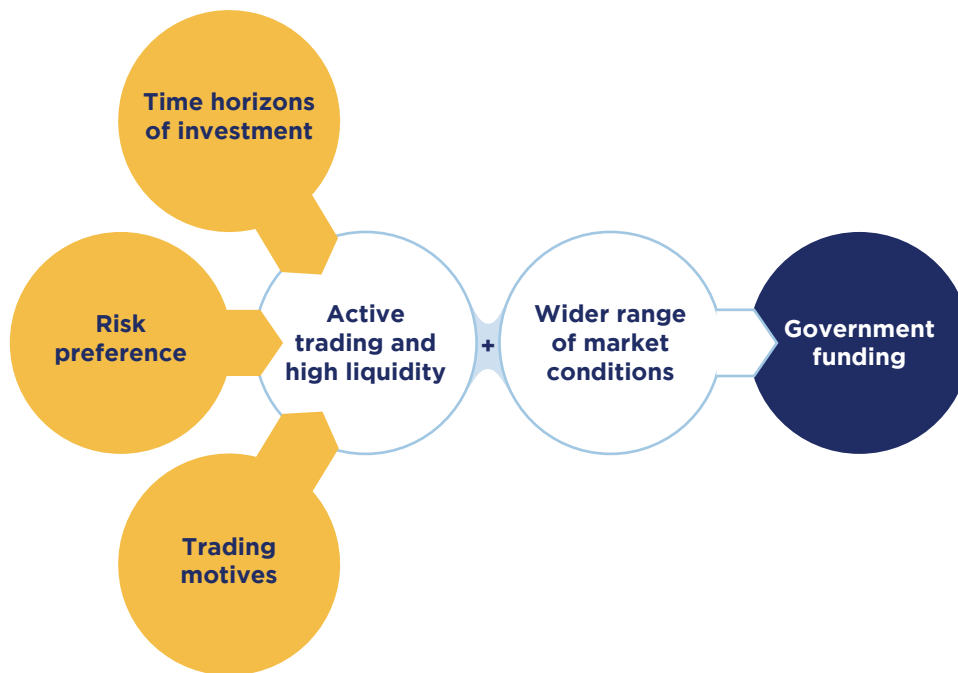
An adequate investor base consists of domestic and foreign investors of various corporate mandates and institutional natures: banks, insurance companies, pension and mutual funds, central banks, companies and individuals. Sound practices suggest a positive correlation between a strong investor base and the ability of governments to secure their financing needs (Figure 3.2).

Due to the unique features of government bonds (used in monetary policy as a source of collateral and as a perceived risk-free instrument), regulatory authorities have historically required some banking and insurance reserves to be invested in those bonds. The captive investments are considered a source of demand for government securities, along with voluntary investments of the financial sector and other investors. However, heavy reliance on captive funding sources may backfire in the long run; it can hurt the balance sheet of forced holders and, thus, hinder the interest of voluntary buyers (World Bank 2001).

Banks have good reasons to invest in government securities beyond meeting regulatory reserve requirements. Some examples are to (1) secure a stable flow of interest income that offsets more volatile investments, (2) post collateral in repo transactions, (3) hedge mismatches in other interest rate positions and (4) manage short-term liquidity. As a result, especially where government bond markets

are nascent, commercial banks are typically the main and most stable investors in government securities. However, excessive issuance of public debt to banks can crowd out bank lending to the private sector, which is another reason why diversification of the investor base is important.

Figure 3.2. Diversified Investor Base



Source: Author.

In search of a more diverse investor base, DMOs try to attract contractual saving institutions and collective investment funds: insurance companies, pension funds and mutual funds, which can provide stable demand, especially for long-term fixed-rate securities. Strengthening institutional investors' capacity to buy government securities is critical for public debt management, although the necessary reforms in pension, insurance and health systems are well beyond DMOs' purview.

Given the challenges in developing the domestic contractual saving sector and collective investment funds, DMOs in emerging and developing countries tend to target nonresident investors. Foreign financiers provide liquidity and bring healthy competition to the domestic debt market. The financiers come in many forms, from hedge funds and mutual funds specializing in emerging markets to investors specializing in arbitrage trading. They push for better service from intermediaries and safe operational infrastructure but are more sensitive to changes in risk and more likely to take flight. Tapping foreign financing requires a stable macroeconomic environment and prudent capital account liberalization.

In sum, understanding investors' profiles and preferences is at the core of an ABP. Where can that information be found? Debt managers usually look at primary-dealership reports, registry information, local and international central securities depositories, international institutions (e.g., Bank for International Settlements, European Central Bank, International Monetary Fund) and subscription services for market intelligence. Some investors are obliged to make public their holdings, providing a useful source of information for DMOs.

3.6. External Debt and Access to International Capital Markets

External financing can be an important element in the ABP but mainly in countries whose domestic debt markets are not big enough to cover the government's financial needs. The primary funding sources of external debt are bilateral finance, which includes export credit agencies, supranational and multilateral development banks, commercial creditors and international capital markets.

Bilateral finance is a significant funding source for developing countries and bears concessional financial terms. But it is usually linked to a project and often has conditionalities that require provision of goods and services from the creditor's country.

Multilateral finance is a source for long-term projects and, depending on the development level of a country and its economic and financial environment, can be linked to programs and sectors. The loans carry either concessional or market-based terms, are provided to develop the economy and have embedded conditionalities.

Commercial loans may be considered backup lending facilities for liquidity management but are primarily offered by commercial banks to finance projects. The loans are usually small, and the terms are less competitive than those of multilateral finance.

As an important element of external debt, foreign financing of infrastructure by multilateral and commercial lenders has recently offered a solution for projects with large upfront investments, high technical specificity and low re-deployable value. The sectors involved range widely, from transport to the environment, and the modalities can link repayments to cash-flow generation from the underlying project (see chapter 7) (Table 3.5).

As with domestic financing, DMOs try hard to diversify their sources of external financing. They especially look into the type of instruments offered, the creditor's mandate and the purpose of the funding. They first seek to maximize concessional and semi-concessional lending from bilateral and multilateral loans and, if needed, raise funds from commercial banks and international capital markets. DMOs' final choice is guided by the parameters of the debt management strategy, notably in terms of currency, interest rate and maturity.

Table 3.5. Instruments and Vehicles for Infrastructure Financing

Modes		Infrastructure Finance Instruments		Market Vehicles
Asset Category	Instrument	Infrastructure Project	Corporate Balance Sheet / Other Entities	Capital Pool
Fixed Income	Bonds	Project Bonds	Corporate Bonds, Green Bonds	Bond Indices, Bond Funds, ETFs
		Municipal, Sub-sovereign bonds		
Fixed Income	Loans	Green Bonds, Sukuk	Subordinated Bonds	Debt Funds (GPs)
		Direct/Co-Investment lending to infrastructure project, Syndicated Project Loans	Direct/Co-investment lending to infrastructure corporate	
Mixed	Hybrid	Subordinated Loans/Bonds, Mezzanine Finance	Subordinated Bonds, Convertible Bonds, Preferred Stock	Mezzanine Debt Funds (GPs), Hybrid Debt Funds
		YieldCos	Listed infrastructure & utilities stocks, Closed-end Funds, REITs, IITs, MLPs	
Equity	Listed	Direct/Co-investment in infrastructure project equity, PPP	Direct/Co-Investment in infrastructure corporate equity	Listed Infrastructure Equity Funds, Indices, Trusts, ETFs
		Unlisted	Unlisted Infrastructure Funds	

ABS = asset-backed security, CLO = collateralized loan obligation, ETF = exchange-traded fund, GP = general partner, IIT = infrastructure investment trust, MLP = master limited partnership, PPP = public-private partnership, REIT = real estate investment trust.

Source: Organisation for Economic Co-operation and Development (2015).

On occasion, DMOs tap the international bond market for a mix of strategic and opportunistic reasons. Since interest rates are usually lower and tenors longer in international than domestic capital markets, debt managers issue international sovereign bonds to reduce cost and increase average maturity but with a trade-off of increased currency risk. Beyond that, borrowing from international markets is attractive to debt managers for other reasons, such as meeting funding needs, providing foreign currency and broadening the investor base. International bond issues may serve as a benchmark for the private sector and even help in branding the issuer to promote the country's name and attract foreign investors (Figure 3.3).

International capital markets allow the sovereign issuer to access various financing and hedging alternatives. Market conditions and available sources may offer funding that matches high-level debt management objectives with no policy conditions or strings attached, but such funding can be more costly. Due to "bullet" principal repayment, the debt portfolio may become more exposed to refinancing risk and more difficult to deal with in case of a default. Because of the specificities of international markets, issuers are advised to follow six steps throughout the whole process (Van der Wanssem et al. 2019):

1. Issue a Eurobond in a preferred structure and assignment of an internal deal team
2. Select banks and advisors
3. Prepare bond documentation

4. Communicate with investors
5. Actual issuance, price guidance, book building and allocation
6. After issuance

Figure 3.3. Reasons for International Bond Issuance and Underlying Dynamics



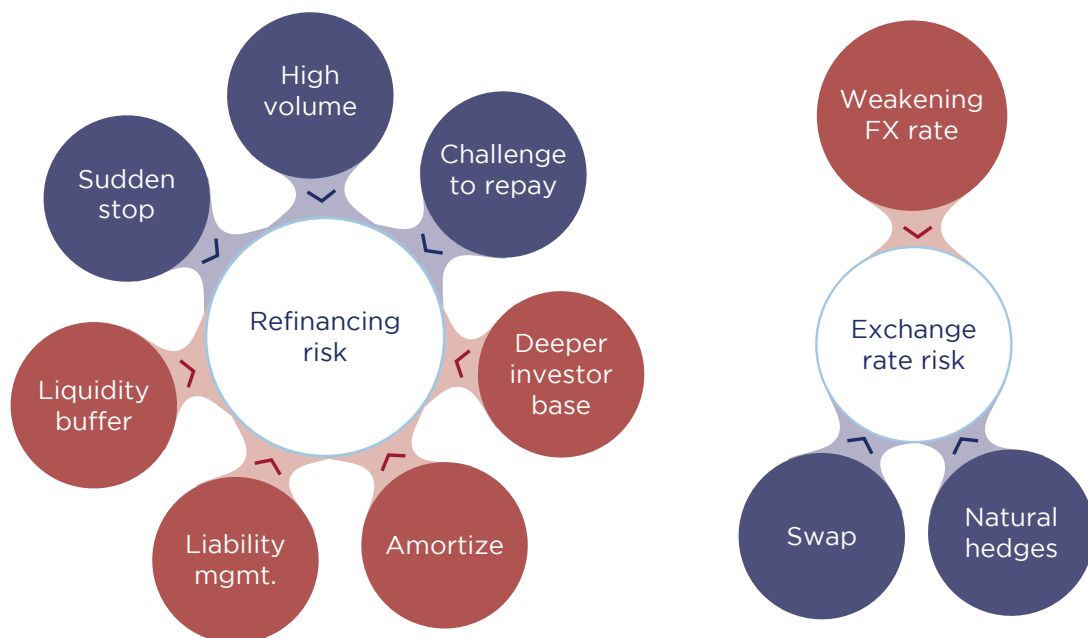
Source: Adapted from Cabral (2018).

The first four steps refer to the **pre-issuance phase**, consisting of making a funding decision and creating a well-equipped task force. Debt managers must assess key considerations about several parameters. The main parameters are the selection of the issuance market and timing, targeted volume maturity and targeted coupon of the issue. Choosing the lead manager is crucial as it directly affects the transaction's success. However, the whole process should remain under the control of debt managers, not the executors and advisors. Sustainability of the financing—the availability of funds to refinance over time at different sources—

should be considered in the decision-making process. Step 5 is about **execution** and includes (1) the official announcement of the issuer's intention, (2) collection of indicative orders, (3) setting of the coupon rate, (4) determination of the price, (5) disclosure of results and (6) settlement. In step 6, the **post-issuance phase**, DMOs make sure that (1) proceeds are transferred, (2) fees are paid, (3) issuance is recorded immediately, (4) the secondary market is monitored and (5) risks are managed.

Overall, external borrowing, as a significant source of financing in emerging markets and developing countries, exposes the public debt portfolio to exchange rate volatility, unlike local-currency borrowing. External borrowing carries substantial refinancing risk, given the volatility of the global economy. Due to longer maturities and the dominance of fixed-rate issues, interest rate risk can be relatively low (Figure 3.4).

Figure 3.4. Major Risks and Mitigation Tools



FX = foreign exchange, mgmt. = management.

Source: Author.

Financial solutions are structurally embedded in external debt instruments offered by multilaterals and stand-alone financial products to help debt managers mitigate market risks at a cost and support countries that have a certain level of financial acumen. More advanced DMOs use debt buybacks and debt exchanges to moderate the risk of refinancing external debt; others resort to currency swaps to reduce the potential cost of currency depreciation. This type of LMO is analyzed in detail in chapter 4.

3.7. Conclusion

The ABP is essential for implementing a government's debt management strategy. The plan is vital for budget, cash management and monetary-policy purposes as it answers critical questions about the government's finances. By determining the financing needs for the year, the ABP has an answer for how much; by setting out the timing of borrowing, it explains when; and by breaking down domestic and external sources, it describes how. The ABP is a guideline for investors because it contains information about upcoming issuances. It fosters transparency, accountability and predictability.

As the largest issuer in most countries, the government executes the ABP in the domestic bond market through an issuance plan and auction calendar. The ABP's successful implementation relies on reconciling the market's preferences and the government's borrowing strategy in the issuance plan. As a dynamic optimization process, the issuance plan serves the government's cost and risk targets and other purposes, such as diversifying the investor base and providing liquidity to the market. Debt managers use the ABP as one of the most important channels for communication with market participants. How the issuance plan is developed, implemented and communicated can give the markets such messages as "The DMO hears you" and/or "The DMO has priorities to be acknowledged by the market." Debt managers should carefully design and execute the issuance plan and auction calendar. Operating under sound issuance principles would be beneficial (Mu 2007).

Issuance mechanisms and distribution networks are as important as the ABP and issuance plan. They can broaden the investor base and encourage stable and continuous demand for government securities. That is particularly important in emerging and developing countries, where commercial banks are the main buyers of those securities, which may crowd out credit to the private sector. DMOs in those countries aim to facilitate participation of nonresidents. However, foreign participation is both an opportunity and a challenge as it diversifies and increases the investor pool but subjects the country to the risk of capital flight. DMOs consider establishing a primary-dealership system as another way to secure strong and stable demand for government debt, although one that may not fit countries where the financial market is small and operational infrastructure is limited.

Countries whose domestic financial markets are underdeveloped are left with little option but to tap external borrowing, which carries rewards (lower rates, longer maturities) and risks (exposure to refinancing, currency depreciation). These countries tend to maximize their access to concessional lending from multilateral banks and bilateral donors first. One type of external borrowing is becoming more common in rich, small countries: financing for infrastructure projects.

Each country tailors its debt management strategy and ABP to best fit its risk tolerance, investor base, market infrastructure, institutional capacity and long-term financial development goals. While there are best practices, no single model is valid for all countries. The only common feature is the constant need for building technical and administrative capacity to benefit from market innovations and scientific progress.

References

- Arnone, Marco, and George Iden. 2003. Primary Dealers in Government Securities: Policy Issues and Selected Countries' Experience. IMF Working Paper WP/03/45. International Monetary Fund, Washington, DC.
- Blommestein, Hans J., Mehmet Emre Elmadag, and Jacob Wellendorph Ejsing. 2013. Buyback and Exchange Operations: Policies, Procedures and Practices among OECD Public Debt Managers. OECD Working Papers on Sovereign Borrowing and Public Debt Management 5. Paris, Organisation for Economic Co-operation and Development.
- Cabral, Rodrigo. 2018. External Debt: Approaching the International Bond Market. Presentation at the Workshop on Implementing Government Debt Management Strategies. The World Bank.
- Hashimoto, Hideo, Yen Mooi, Guilherme Pedras, Arindam Roy, Kay Chung, Tadeusz Galeza, Michael G. Papaioannou, Peter Katz, Zsolt Bango, Jose Antonio Gragnani, Bryan Gurhy, and Cindy Paladines. 2021. Guidance Note for Developing Government Local Currency Bond Markets. Washington, DC: International Monetary Fund and the World Bank.
- International Monetary Fund and World Bank. 2001. Developing Government Bond Market: A Handbook. Washington, DC.
- International Monetary Fund and World Bank. 2014. Revised Guidelines for Public Debt Management. Washington, DC.
- Inoue, Hirotaka. 1999. The Structure of Government Securities Markets in G10 Countries: Summary of Questionnaire Results. In *Market Liquidity: Research Findings and Selected Policy Implications*, 11, 1-22. Basel, Switzerland: Bank for International Settlements.
- Ministry of Finance of Italy. No date. Italian Government Bonds in a Nutshell. Public Debt Management Network.
- Mody, Ashoka, Stijn Claessens, Shahin Vallee. 2012. Paths to Eurobonds. IMF Working Papers WP/12/172. International Monetary Fund, Washington, DC.
- Mu, Yibin. 2007. Technical Note: Issuance Mechanisms for Government Securities. Washington, DC: World Bank and IFC Capital Markets Advisory Group.
- Organisation for Economic Co-operation and Development (OECD). 2015. Infrastructure Financing Instruments and Incentives. Paris.
- Organisation for Economic Co-operation and Development. 2016. Sovereign Borrowing Outlook 2016. Paris.
- Organisation for Economic Co-operation and Development. 2019. Sovereign Borrowing Outlook 2019. Paris.
- United States Agency for International Development (USAID) and Commonwealth Secretariat. 2010. Developing Government Bond Markets: Primer, Diagnostic Checklist, and Guidelines for the Preparation of a Model Scope of Work. Financial Sector Knowledge Sharing Series 12. Washington, DC.
- Van der Wansem, Patrick B. G., Lars Jessen, and Diego Rivetti. 2019. Issuing International Bonds: A Guidance Note. MTI Global Practice Discussion Paper 13. World Bank, Washington, DC.

World Bank. 2010. Primary Dealers System: Draft Background Note. Washington, DC.

World Bank Group. 2015. Issuance Plan for Government Securities: Guidance Note. Washington, DC.

World Bank Group. 2017. Government Debt Management: Designing Debt Management Strategies. Debt Management Learning and Training Notes: 1. Washington, DC.

Chapter 4

Old and New Instruments for Public Debt Management

Antonio Davila

Abstract

The public sector's wide-scale adoption of sound debt management practices over the past decades has empowered debt managers to utilize an ever-greater variety of instruments to raise funding and manage risk. The chapter presents an overview of the key concepts of the instruments, including debt swaps, debt buybacks and financial derivatives to manage financial risks, and thematic, catastrophe and sukuk bonds to raise funding for projects.

4.1. Introduction

A typical debt manager in the public sector is responsible for a large number—sometimes thousands—of outstanding loans, bonds and derivatives. The debt portfolio is not left dormant but requires constant and proactive optimization. As market and country circumstances change, the mix of interest rates, currencies, maturities, balances and other parameters must be adjusted to reduce costs and risks. The financial instruments that make up the portfolio are initially chosen with subsequent flexibility in mind, lest they lock the government into exposures that cannot be undone or hedged.

The practice of liability—and risk—management is relatively new. Two critical factors have fostered its development and widespread adoption:

1. **Creation of new market instruments.** This is especially true since the mid-1970s, with the introduction of financial derivatives to be used for hedging risks.
2. **Financial turmoil.** The tequila crisis in Mexico in 1994, the Asian financial crisis in 1997 and the United States (US) mortgage crisis in 2008, to name a few, all forced debt managers and central bankers to better evaluate their debt portfolios and build their capacity to manage exposures. Today, liability management is mainstreamed, even in low-income countries with limited market access.

The chapter presents an overview of the instruments—old and new, *ex ante* and *ex post*—that debt managers possess to manage their liabilities. Section 2 covers conventional tools for liability management, section 3 explores the new wave of thematic bonds, and the last section presents less conventional financial products that cater to specific needs, such as natural disasters and religious principles.

4.2. Instruments for Liability Management

4.2.1. Debt buybacks and debt swaps: An early clarification

Debt managers regularly buy back (with cash) or swap (for new securities) their debts to either optimize their portfolio of liabilities (say, smooth redemption bumps) or increase the liquidity of their bonds (help bondholders convert their assets into cash). Buybacks and swaps are voluntary and executed transparently at market-clearing prices, according to an announced methodology.

Buybacks and swaps fundamentally differ from debt restructuring, which renegotiates the terms of a debt. Renegotiation aims to reduce the value of the outstanding claim and is associated with what credit-rating agencies consider a credit event: a default.⁷¹

⁷¹ The International Swaps and Derivatives Association's definition of a credit event includes bankruptcy, payment default or debt restructuring.

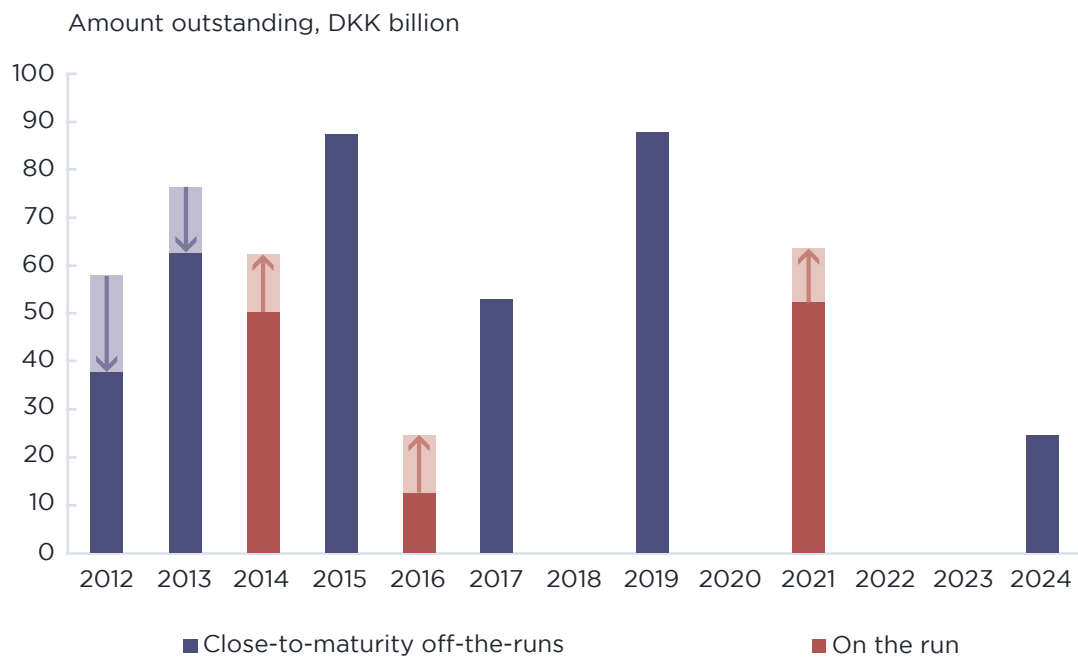
Restructuring arises typically from the debtor’s inability and/or unwillingness to repay and can lead to protracted litigation; after all, bondholders are likely to see a reduction in the face or net present value of their securities. Various legal clauses—such as “cross-default” and “*pari passu*”—may force all creditors to the restructuring table, including bilaterals (under the Paris Club) and multilaterals.

4.2.2. Debt buybacks

Debt buybacks consist of the exchange of an existing debt security for a cash payment, where the issuer (the borrower) of the security pays the holder (the investor) the market value of the security. Some issuers use their existing cash reserves to finance the transactions, while others use the proceeds from new issuances. Buybacks can be done for domestic or international issuances, although most are done for domestic securities to increase their liquidity.

Buybacks affect the size of service payments (interest plus principal), as they change the stock of debt, the average interest rate or sometimes both. They lower the debt stock by their face value, which saves interest on the debt bought back and possibly on principal if the debt was repurchased at a discount. Some countries buy back their debt when it improves the balance between their assets and liabilities. Others do it periodically to increase the liquidity of their own securities in their markets.

Figure 4.1. Debt Buyback



Source: Government Debt Management, Danmarks Nationalbank.

Denmark's National Bank buys back close-to-maturity bonds (Figure 4.1, in blue), that is, bonds maturing in the current year or the next. The bank funds the operation by increasing the size of on-the-run bonds⁷²—new two-, five- and 10-year bonds (in yellow)—in a separate operation. The bank could also have used its cash reserves, thereby lowering the sovereign's debt stock.

Box 4.1. Brady Bonds: Precursor to Debt Swaps and Buybacks?

- Brady bonds (named for Nicholas Brady, former United States (US) treasury secretary, were issued beginning in 1990 by countries seeking to restructure and alleviate their debt burdens, especially in Latin America.
- Brady bonds served to help heavily indebted countries extend the maturities and reduce the costs and stock of debt. The bonds contained exotic features to reduce investor risk, including US zero-coupon treasury bonds held as collateral.
- As countries gained more access to capital markets and world interest rates fell, Brady bonds became relatively expensive.
- That prompted the issuer countries to reduce or eliminate their Brady bonds through buyback or swap operations. As a result, outstanding Brady bond holdings declined from USD154 billion in 1994 to USD10.7 billion by mid-December 2006.
- Repurchases of Brady bonds to lower debt service costs have been a major factor in the recent interest in debt buyback and swap activity.

Source: International Monetary Fund (2012).

4.2.3. Debt Swaps

Debt swaps (also called “debt exchanges”) are like buybacks but with one important distinction: they consist of an exchange of debt instruments, with no cash involved. The bond issuer and the bondholder simply trade one bond for another, typically to retire a bond close to maturity, say one year away, and replace it with a bond with a longer maturity. The stock debt of the issuer will not change in a debt swap, only the debt profile does, typically toward a longer average maturity.

Here the difference with debt restructuring becomes even more important. Unlike a restructuring, a swap is a voluntary and open agreement between the bond issuer and the bondholder to replace a maturing bond with a longer-dated one. A swap is essentially a debt rollover operation.

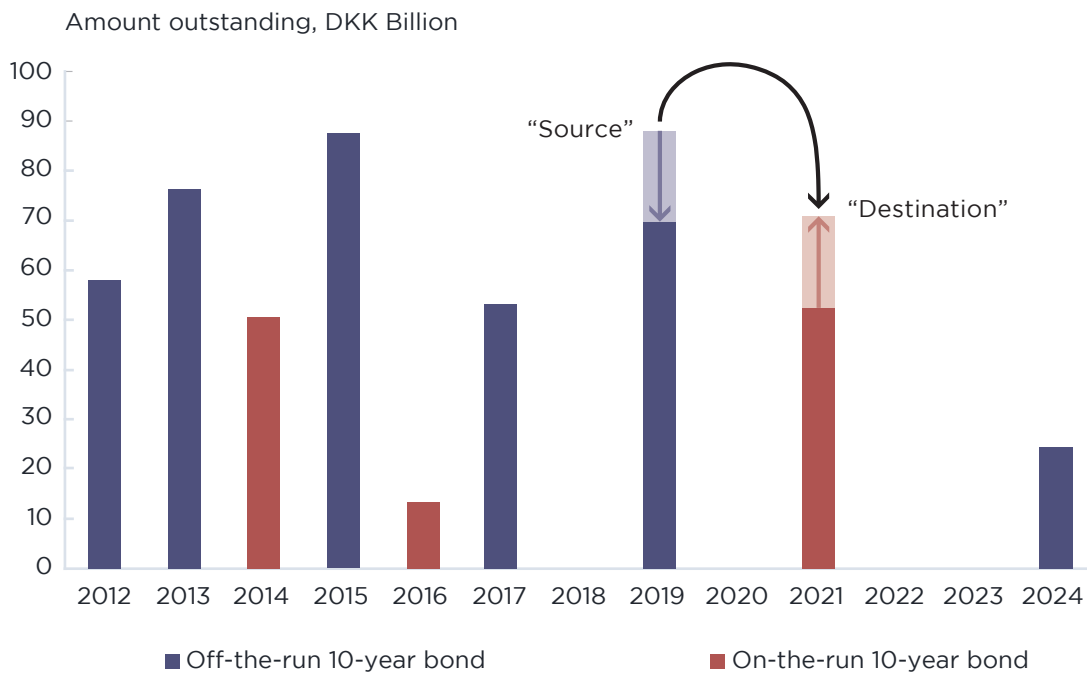
Figure 4.2 shows that the off-the-run 10-year bond maturing in 2019 (source bond) is exchanged for an increase in the on-the-run 10-year bond maturing in 2031 (destination bond). More complex debt swap operations could involve multiple-source and/or destination bonds.

Debt buybacks and debt swaps can serve multiple objectives: funding, portfolio composition and liquidity. Their use is, however, constrained by the context in which they are implemented. Some constraints are outside the control of the debt manager, such as the dynamics of the capital markets, the regulatory environment that governs

⁷² On the run refers to the status of a security with a specific maturity. For example, a 10-year bond is said to be on the run from the time it is issued until a new 10-year bond is issued, at which time the older 10-year bond becomes an off-the-run bond, and the newly issued bond becomes the on-the-run security.

international securities trading and the sovereign's credit rating. Some are policy choices, such as the objectives of the debt strategy and the choice of foreign exchange regime. And some are institutional: Does the debt management office have the human and information technology (IT) capacity to deal with the regulatory, documentation, settlement and accounting aspects of buybacks and swaps?

Figure 4.2. Debt Swap

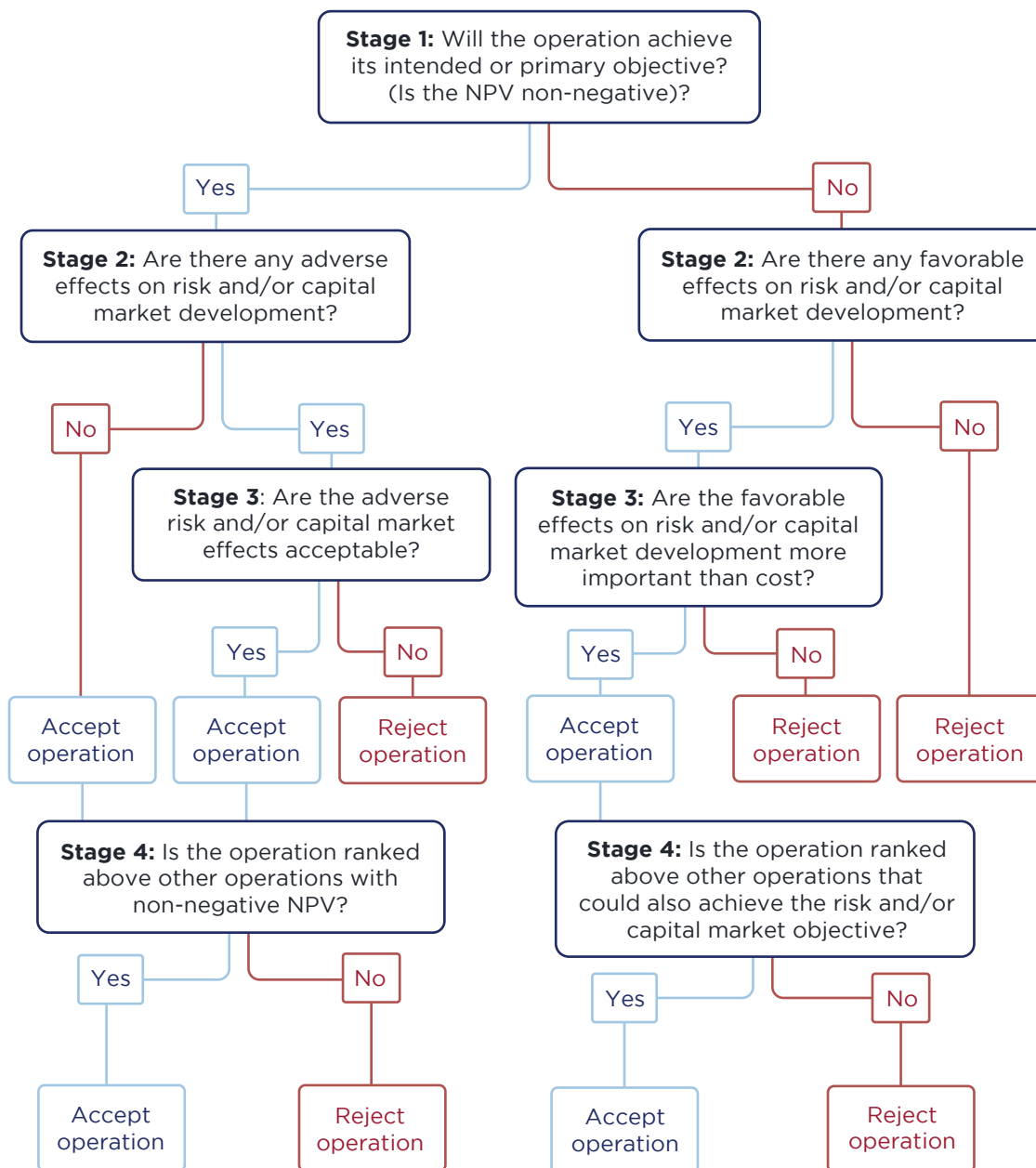


Source: Government Debt Management, Danmarks Nationalbank.

Deciding to execute a buyback or a swap is a matter of trade-offs. Should the debtor use existing reserves, issue a new security or reopen an on-the-run issuance to fund the operation? Should it be opportunistic (wait for the right moment) or rule-based (follow an announced calendar)? Should it call for tenders, organize auctions or select specific dealers? And should it tap the domestic or the international market? To assist debt managers with these decisions, the International Monetary Fund (IMF 2007) provides a decision tree (Figure 4.3) based on five strategic questions:

1. What is the objective of the operation?
2. Will the operation achieve its intended objective?
3. What are the trade-offs and complementarities?
4. Do the trade-offs and complementarities affect the decision?
5. What is the ranking of the buyback or swap?

Figure 4.3. Debt Swap and Buyback Decision Tree



Source: International Monetary Fund (2007).

Finally, debt buybacks and swaps should be evaluated in the broader context of risk management, to which they directly contribute. The evaluation applies before (risks in the existing portfolio), during (new risks brought about by buybacks or swaps) and after (risks in the resulting portfolio) the transaction. Table 4.1 shows the main risks that need consideration.

Table 4.1. Main Risks Affecting Debt Portfolios and Financial Operations

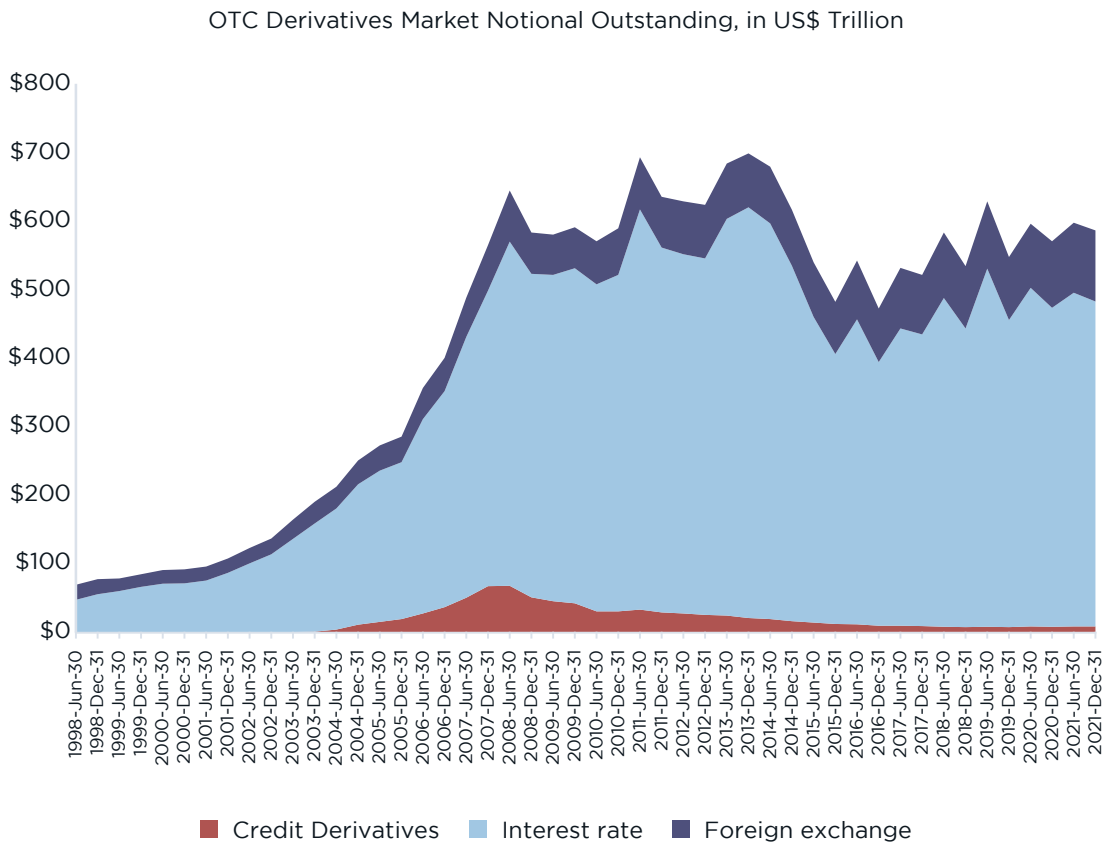
Risk	Definition
Market	Risk that market conditions, such as interest rates, exchange rates, commodity prices, will affect the cost of the government's debt servicing
Rollover	Risk that debt will have to be rolled over at an unusually high cost or, in extreme cases, cannot be rolled over at all
Liquidity	Cost or penalty investors face in trying to exit a position when the number of transactors has markedly decreased or because of the lack of depth of a particular market Risk of a situation where the volume of liquid assets diminishes quickly in the face of unanticipated cash-flow obligations and/or a possible difficulty in raising cash through borrowing in a short period
Credit	Risk of nonperformance by borrowers on loans or other financial assets or by a counterparty on financial contracts
Settlement	Refers to the potential loss that the government, as a counterparty, could suffer as a result of another counterparty's failure to settle, for whatever reason other than default
Operational	Includes a range of different types of risks, including transactions, inadequacies or failures in internal controls or in systems and services, reputation risk, legal risk, security breaches or natural disasters that affect business activity

4.2.4. Currency and interest rate swaps

Public debt managers usually hedge the exposures in their portfolio by using financial derivatives, which are financial contracts that establish the terms of a financial transaction between two counterparties. Derivatives include swaps, options, futures and forwards. Some are standardized and traded in markets (such as the Chicago Mercantile Exchange), and others are contracts privately arranged between two parties over the counter (OTC).

Two types of OTC derivatives are commonly used for managing risk in debt profiles: interest rate swaps and currency swaps. Typically, a bond issuer that faces a stream of interest payments at variable rates will swap that stream for another at fixed rates to manage the risk of rising interest rates. A similar arrangement can swap a stream of debt service payments in a given currency for another in a different currency to manage the risk of unfavorable changes in exchange rates. The counterparty in that type of private contract is usually an investment bank, which charges a fee for its participation. For the debtor, the fee is the price of hedging against a sudden increase in interest rates or a sudden appreciation of the currency in which the debt is nominated.

The OTC market has been growing steadily over the past 20-plus years, mainly because, on the demand side, a culture of risk management is spreading in the corporate and public sectors; on the supply side, commercial banks are increasingly offering those types of products. The OTC market is large, with a notional value of all trades reaching about USD600 trillion. It is dominated by interest rate swaps, with currency swaps a distant second.

Figure 4.4. Over-the-Counter Derivatives Market: Notional Outstanding

Source: Bank for International Settlements (2022).

While interest and currency swaps—and derivatives in general—are effective tools to optimize debt portfolios, they bring their own perils. Not all public debt management offices have the technical analytical capacity or the IT systems to quantify and track risk exposures, compute positions and estimate the value of their portfolios (mark-to-market computations). There are operational risks, too, especially when assessing possible market fluctuations, executing and settling transactions and recording and evaluating the results. But most importantly, credit risk is inherent to using derivatives, for they involve contractual obligations to pay and receive cash to or from a counterparty. If the counterparty cannot satisfy its side of the cash flows, the trade turns into a loss. Posting collateral helps moderate credit risk but requires clear policies on what type and quantity of collateral is acceptable, so much so that banks often provide the service of computing and/or managing collateral on behalf of their client.

The most common barrier to using derivatives in public finance is a legal one: most emerging and developing countries have not formally recognized and adopted the master agreement of the International Swaps and Derivatives Association (ISDA). It is a template contract incorporating standards, definitions and procedures necessary for OTC transactions. It provides confidence to market counterparties that the operation is executable and enforceable. A more detailed description of the ISDA master agreement is in chapter 5.

4.2.5. Contingent debt instruments

Unlike conventional borrowing, intended to get cash upon loan signing or bond issuance, contingent debt instruments, also known as credit lines, are not expected to be disbursed and are meant to be part of a backup (contingency) plan. The instruments have prearranged terms and conditions and provide immediate liquidity to the borrower during an emergency. For the convenience of having these credit lines in place, the borrower commonly incurs three costs: (1) an origination fee, normally a one-time fee to offset the cost of structuring the financing, (2) a standby fee, or the ongoing fee for maintaining the financing open and (3) an interest charge, like a regular loan, on the outstanding balance, if and when the credit line is disbursed.

While they are a sign of sound debt management, contingent credit lines are not widely used among sovereign borrowers for many of the same operational and political reasons that prevent governments from actively managing their risks through insurance or hedging instruments. About a decade ago, the IMF and the World Bank (Figure 4.2) stepped into that market, with some success. They offer lines of credit to cover two contingencies: fiscal crises and natural catastrophes. The lines may have conditions but provide an alternative source of funding when access to the capital markets is closed, disaster strikes or both.

Table 4.2. Terms of the World Bank's Two Main Contingent Financing Instruments

Development Policy Loan: Deferred Drawdown Option	Catastrophe: Deferred Drawdown Option
Budget support loan to be used during financial or other emergency	Line of credit providing immediate liquidity following a natural disaster and/or health-related event
Conditions: Appropriate macroeconomic policy framework	Conditions: Macroeconomic policy framework and risk management program
Tenor: bullet (one principal payment) up to 12 years or amortizing up to 20 years	Country limit: USD500 million or 0.25% of gross domestic product (whichever is less)
Drawdown: 3 years from signing, renewable one time	Drawdown trigger: Prespecified (e.g., declaration of a state of emergency)
Amortization: Can be modified at drawdown	Drawdown period: 3 years, renewable up to 15 years
Lending rate: Variable reference + variable spread	Revolving feature: Amounts repaid available for subsequent withdrawal
Origination fee: 0.25%	Repayment schedule: 35-year final maturity and 20-year average repayment period
Stand-by fee: 0.50%	Lending rate: Variable market-based reference rate plus a variable spread
	Origination fee: 0.50%
	Renewal fee: 0.25% of the undisbursed balance
	Stand-by fee: None

Source: World Bank (2022).

For example, Indonesia's government used the World Bank's development policy loan—a deferred draw-down option (DPL-DDO) instrument during the 2008 global financial crisis. Having learned from its experience during the 1997 Asian crisis,

when capital inflows dried up, Indonesia erected a backup financing facility to send a signal to markets and boost investor confidence. The USD5.5 billion facility was supported by the World Bank (a USD2 billion DPL-DDO), the Asian Development Bank and the governments of Australia and Japan. The facility enabled Indonesia to raise over USD6.3 billion through five bond issuances in capital markets throughout the 2008 crisis, without disbursing World Bank financing.

As of January 2022 (World Bank 2022), the World Bank's catastrophe-DDO has been used by 13 countries, providing a total credit line of USD3.8 billion. They have disbursed a total of USD3.08 billion following natural disasters, of which USD1 billion was disbursed in 2021 alone, triggered by the coronavirus disease (COVID-19) pandemic. Similarly, the World Bank's DPL-DDO instrument has been used by 10 countries with a total credit line of USD8.8 billion, disbursing a total of USD6.6 billion.

4.2.6. Debt-for-nature swaps

Debt-for-nature swaps aim to exchange debt relief for a commitment to invest in biodiversity conservation and environmental activities. In a post-pandemic environment of fallen gross domestic products, increased sovereign debt levels and urgent investment needs for climate change, debt-for-nature swaps are expected to gain traction as an innovative way for governments to resolve all three threats simultaneously.

The swaps can involve restructuring, reducing or purchasing a portion of a country's outstanding debt, with a percentage of proceeds (sometimes in local currency) used to support environmental or conservation programs. Most early transactions involved debt owed to commercial banks and were arranged by nongovernment organizations (e.g., Conservation International, The Nature Conservancy) through three-party swaps. Other debt-for-nature initiatives involved official debt and were administered by creditor governments directly with the debtors through bilateral swaps.

The first reported debt-for-nature swap was structured in 1987, a transaction in which Conservation International purchased and canceled USD650,000 of Bolivia's foreign debt in exchange for setting aside for conservation 3.7 million acres of land adjacent to the Amazon basin. Another notable example was the swap between Poland and Paris Club creditors, where creditors forgave half the sovereign's debt in exchange for funding the Polish Eco Fund, established in 1992. A more recent example is Seychelles' agreement with certain Paris Club members in 2016, resulting in a USD22 million investment in marine conservation, supported by The Nature Conservancy.

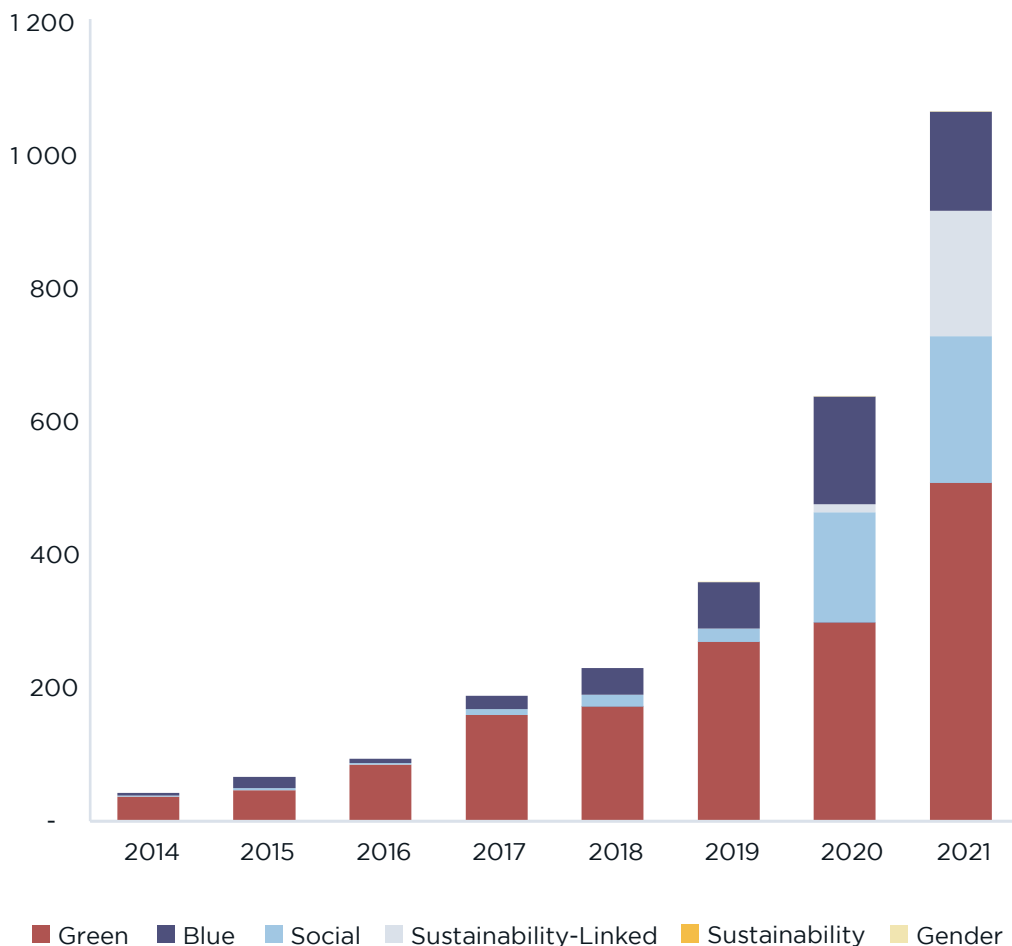
The debt relief component of the swaps can come from three sources: (1) official creditors such as the Paris Club or individual donors such as US Agency for International Development, (2) debt buybacks carried out at a discount in the secondary bond market by a third party or (3) outright grants or subsidies offered by public or private sponsors.

4.2.7. Thematic bonds

Thematic bonds are securities that raise funds from capital markets, just like conventional bonds, but where the use of proceeds is predetermined (that is, not for general funding). In practice, the themes of the bonds refer to environmental, social, and the United Nations' Sustainable Development Goals (SDGs).

Thematic bonds have seen a sharp increase in the number of issuances and issuers, in volumes issued and even in the themes covered; green bonds were the first, and gender bonds are the most recent. Starting with a total issuance of less than USD100 million in 2014, consisting almost exclusively of green bonds by the World Bank, the issuance in 2021 reached USD1 trillion, or a 10-fold increase, with green, social and sustainability bonds taking roughly equal parts. The cumulative issuance of all thematic bonds reached nearly USD3 trillion by the end of 2021.

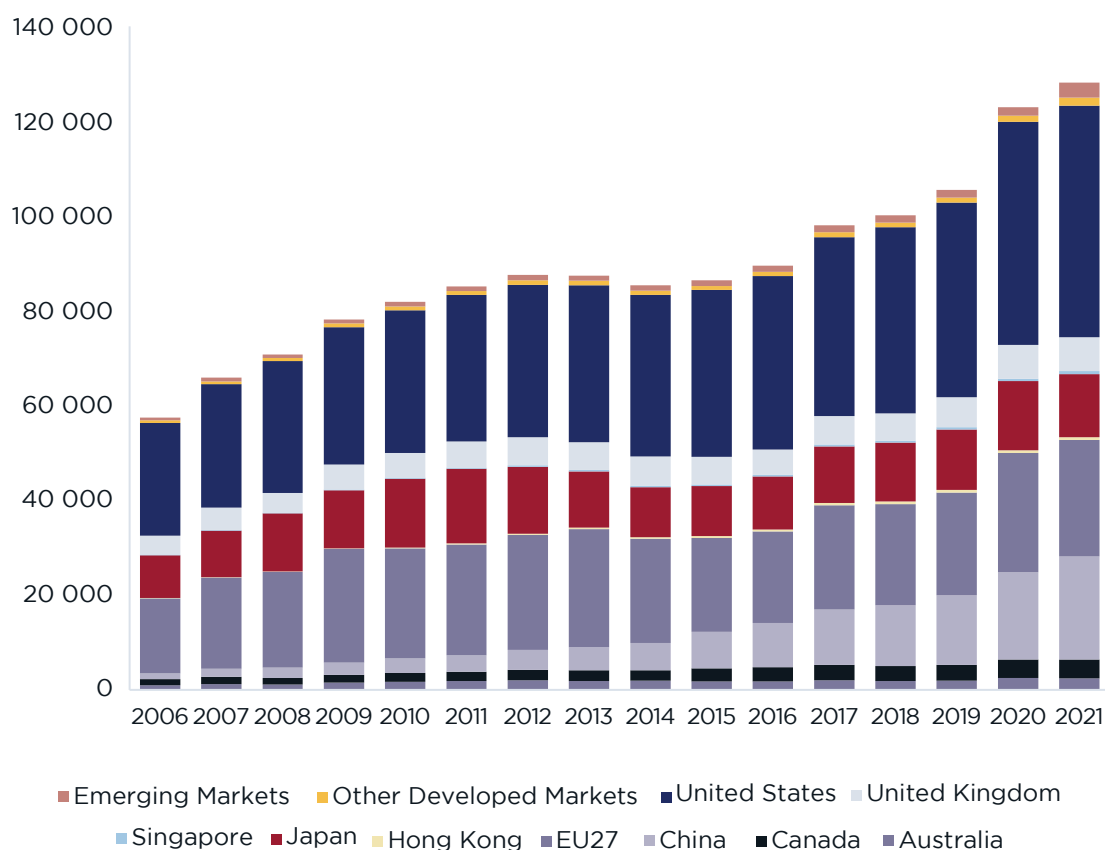
Figure 4.5. Evolution of the Environmental, Social and Governance and Thematic Bond Market Yearly Issuance (USD billion)



Sources: Climate Bonds Initiative (2022), Standard and Poor's (2022) and author estimates.

Despite its rapid growth, the thematic bond market remains small, at about 2% of the total global bond market's outstanding market value of USD130 trillion (Figure 4.6). Although highly visible and with much media coverage, the instruments remain a small asset class within the enormous bond market, which leaves ample room for expansion.

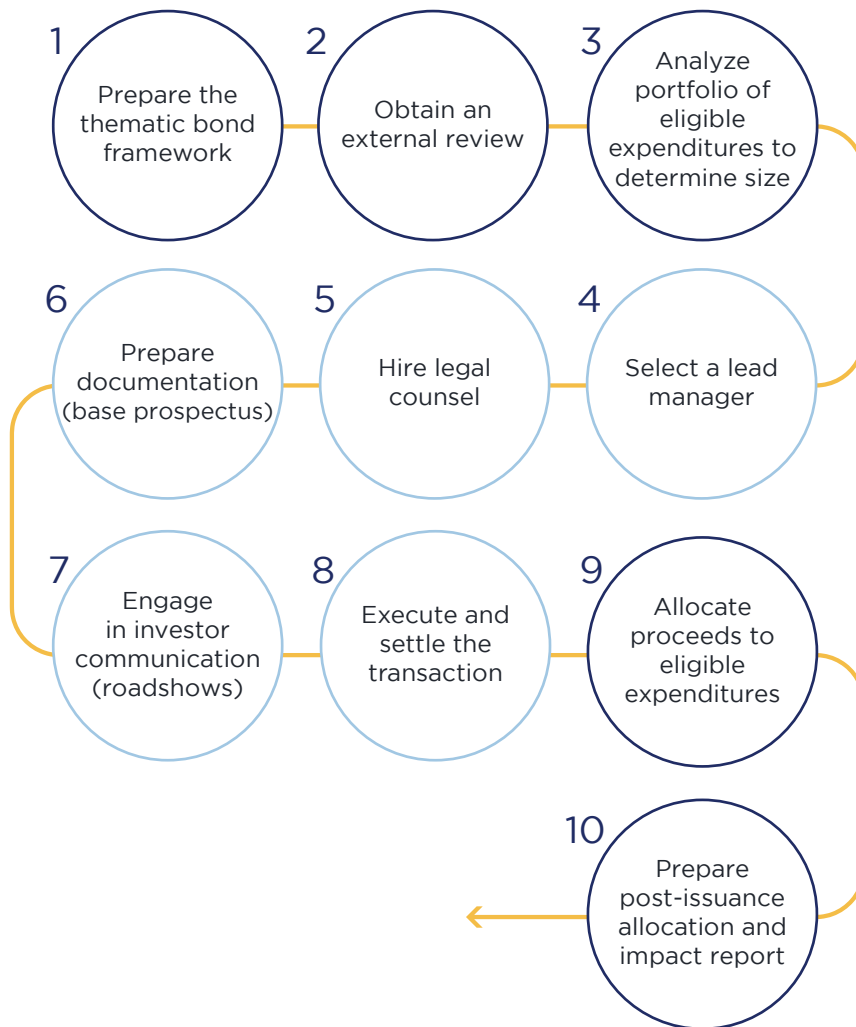
Figure 4.6. Global Bond Issuance: Outstanding Balance by Year (USD billion)



Source: International Capital Market Association and Bank for International Settlements (2022).

Before describing the characteristics of each type of thematic bond, we will first describe the unique process that the bonds follow. In addition to the standard disclosures, legal agreements, road shows, lead managers, credit ratings and conventional bonds, thematic ones follow an additional procedural, critical path that reassures buyers.

Figure 4.7 highlights the key issuance steps in a conventional bond (white circles) and those specific to thematic bonds (blue circles). Thematic bond steps begin with establishing the issuer's thematic bond framework, followed by an assessment of the framework by external reviewers and a preliminary analysis of potential projects to be financed. Once the bonds are issued, their proceeds are allocated to the selected projects, followed by a period of monitoring and reporting.

Figure 4.7. Overview of Major Steps in a Thematic Bond Issuance

Source: World Bank (2020).

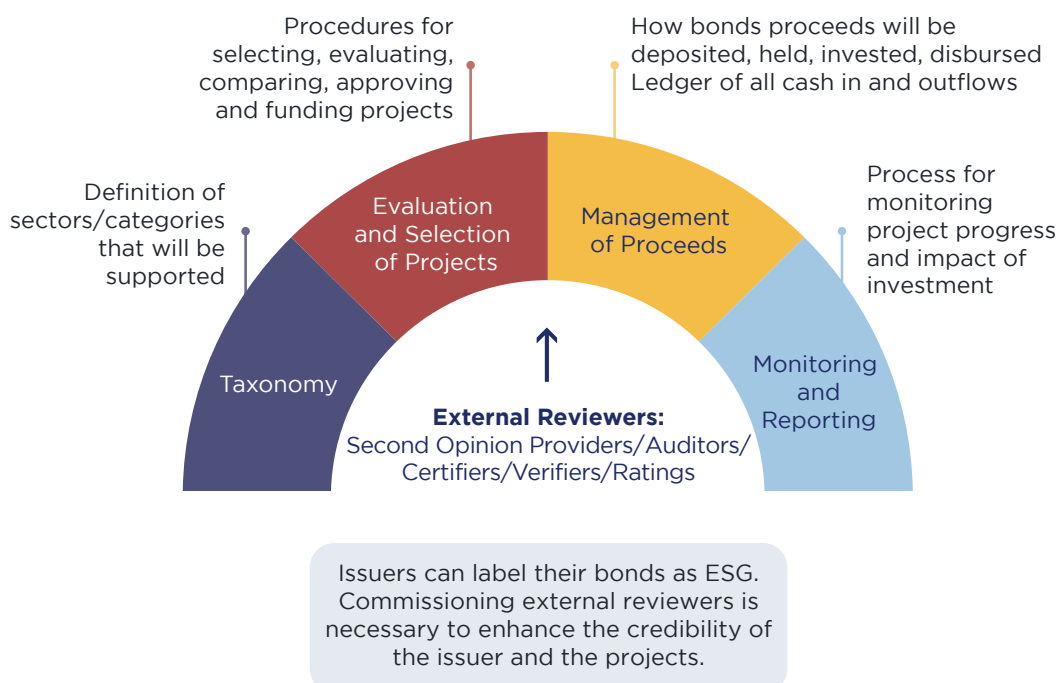
What is a thematic bond framework? It is an overarching document prepared by the issuer for the benefit of investors and describes how the issuer will implement its thematic bond program. The framework (Figure 4.8) contains four key elements:

1. The **taxonomy** is a voluntary classification system that identifies which activities and sectors will be included in the issuer's SDG bond framework. The taxonomy enables all stakeholders (including bond investors) to better understand which investments can be labeled green, sustainability, social, gender and so on in their jurisdictions. Many issuers, such as the World Bank and the government of China, develop their own taxonomies. Other issuers subscribe to general taxonomies (the Climate Bonds Initiative [CBI] Climate Bonds Taxonomy) or regional taxonomies (the European Union sustainable finance taxonomy, the Association of Southeast Asian Nations taxonomy).
2. The **projects** section covers the process that the issuer will follow to identify, select and compare projects to be funded within the context of the issuer's overarching

objectives, strategy and policy. The section should include information on the alignment of projects with official or market-based taxonomies, eligibility and/or exclusion criteria and any SDG standards or certifications referenced in project selection.

3. The **proceeds** section describes how funds raised will be managed, including the accounts or sub-accounts to which they will be credited, the ring-fencing mechanisms to ensure that the use of proceeds matches stated objectives, operational aspects of managing cash inflows and outflows and the mechanism for recording the use of proceeds. The section should describe lending and investment operations procedures and the temporary placement of any unallocated net proceeds. Hiring external auditors can enhance the transparency of the issuer's activities and should be mentioned.
4. The **monitoring and reporting** section describes how, on an *ex post* basis, the issuer will inform investors of the program's results. It lists and describes financed projects, project completion status and disbursement level. Most importantly, the section includes the impact of the projects on the issuer's overall agenda. The section is challenging as it involves developing the methodology for measuring impact, key performance indicators (KPIs) and often a baseline for comparison. Harmonized Framework for Impact Reporting (International Capital Market Association [ICMA] 2022) is useful for new issuers.

Figure 4.8. Framework for Environmental, Social and Governance Bonds

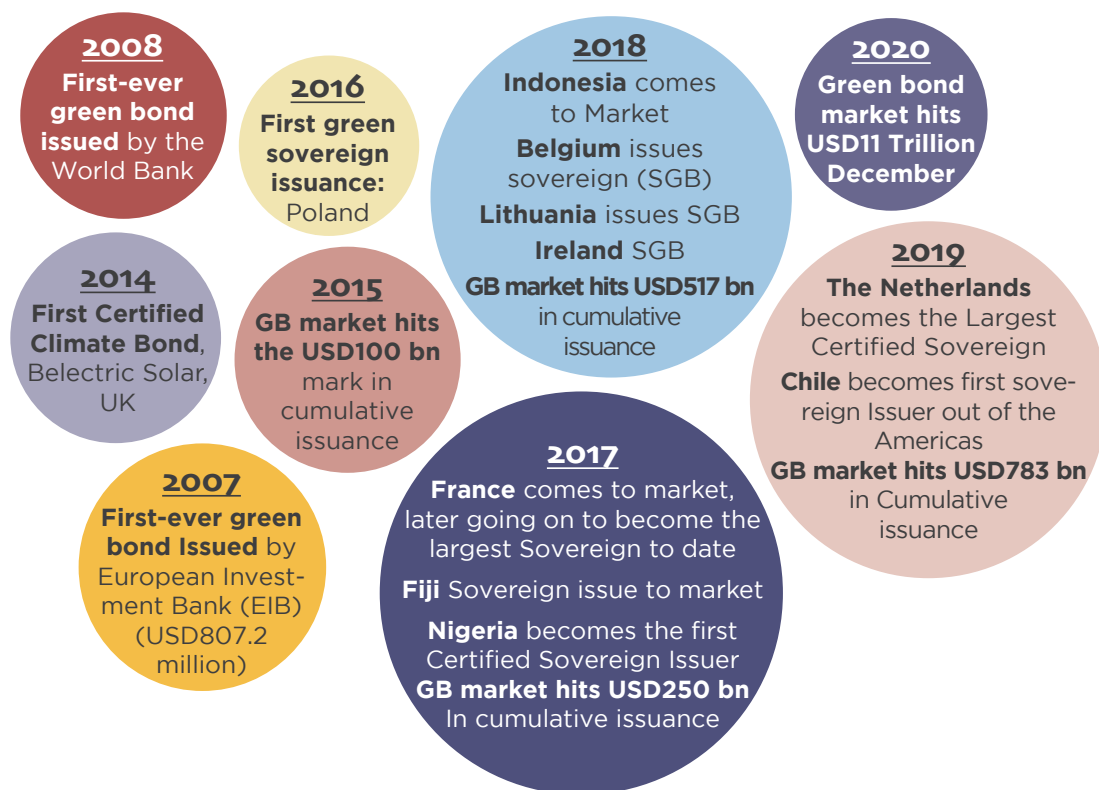


Source: World Bank and Climate Bonds Initiative (2020).

Although purely voluntary, hiring external reviewers is integral to the framework. Doing so helps enhance its credibility and relevance and ascertain the issuer's transparency and legitimacy. External reviewers can take on multiple roles at different stages in program implementation: during framework preparation, the issuance and investment stage, or *ex post* after the projects have been completed.

Hiring the right type of reviewer can be difficult for a new issuer. Fortunately, there is an ever-increasing array of public resources available. For instance, CBI (2022) prepares a comprehensive overview of the types of reviewers and services it provides. ICMA (2022) publishes guidelines for working with external reviewers and publishes and updates a library of external reviewers and their core competencies.

Figure 4.9. Green Bond Milestones



Source: World Bank and Climate Bonds Initiative (2022).

Green bonds. These are debt securities issued to support climate-related or environmental projects. Issuers set the qualifying criteria for green projects and use the bonds to finance initiatives in renewable energy, green buildings, wastewater management, energy efficiency and public transport. Issuers usually follow the Green Bond Principles (ICMA, 2021).

In addition to evaluating the financial characteristics of the security (maturity, coupon, price, credit rating and so on), investors assess the specific environmental purpose of the projects that the bonds intend to support. However, a green bond's return is ultimately decided by the issuer's credit standing, which determines the security's price.

Green bonds were the first of what we now know as thematic bonds. The World Bank issued the first one in 2007, and the European Investment Bank followed in 2008 (Figure 4.9). Starting slowly, the cumulative issuance took seven years to reach USD100 billion. Poland became the first country to issue a sovereign green bond in 2016. Other governments began to take notice, with 10 new sovereign issuers coming to the market in 2018 and 2019 alone. In 2020, the market reached a new milestone, with the cumulative issuance reaching USD1 trillion.

The quick growth in green bond issuance can be attributed to several factors. From an issuer's perspective, green bonds help legitimize a government's (or a corporation's) commitment to investing in green projects while building the domestic framework for measuring environmental achievements. Issuers often speak of increasing investor diversification by appealing to nontraditional institutional buyers. From an investor's perspective, green bonds enable asset managers to "green" their portfolios in the context of increasing demand for SDG assets.

Green bonds are of different types. "Use of proceeds" is the most common and used by sovereign and supranationals. Other types are used by commercial banks, project companies and private-sector corporations. Table 4.3 is an extract of a list of types of green bonds published by the Climate Bonds Initiative.

Table 4.3. Different Types of Green Bond Structures

Type	Use of Proceeds Raised by Bond Sale	Debt Recourse
"Use of proceeds" bond	Earmarked for green projects	Recourse to the issuer: Same credit rating applies as issuer's other bonds
"Use of proceeds" revenue bond or ABS	Earmarked for or refinances green projects	Revenue streams from the issuers though fees, taxes and so on are collateral for the debt
Project bond	Ring-fenced for the specific underlying green projects	Recourse is only to the project's assets and balance sheet
Securitization (ABS) bond	Refinances portfolios of green projects, or proceeds are earmarked for green projects	Recourse is to projects that have been grouped together (e.g., solar leases or green mortgages)
Covered bond	Earmarked for eligible projects included in the covered pool	Recourse to the issuer and, if the issuer is unable to repay the bond, to the covered pool
Loan	Earmarked for eligible projects or secured on eligible assets	Full recourse to the borrower in the case of unsecured loans. Recourse to the collateral in the case of secured loans but may also feature limited recourse to the borrower

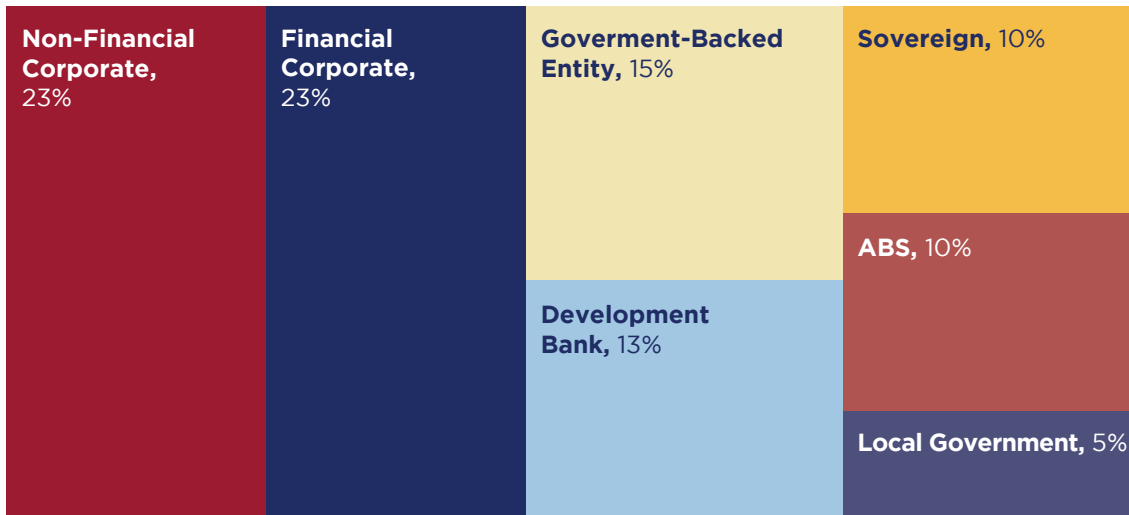
ABS = asset-backed securities.

Source: Climate Bond Initiative, Green Bond Principles.

From its early days in 2014 through 2021, the cumulative amount of green bond issuance reached USD1.6 trillion. Although started by supranationals and sovereign issuers, the corporate sector accounts for over half the issuance volume to date.

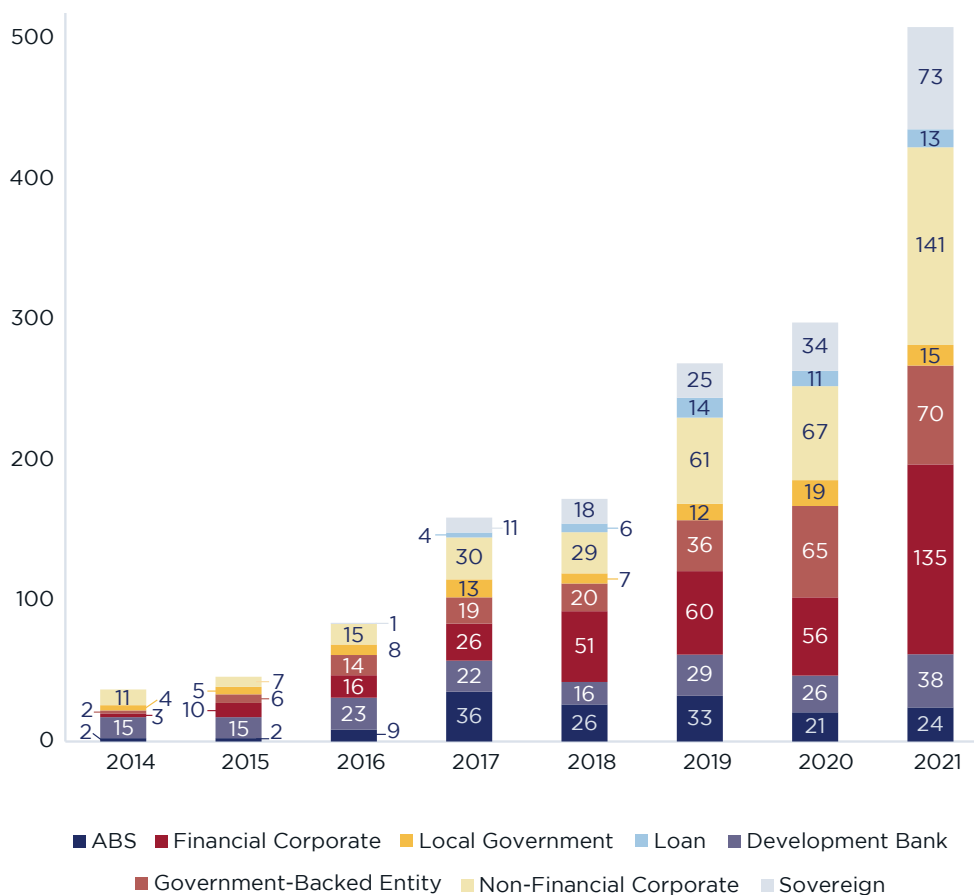
Figure 4.10. Green Bond Issuance: Cumulative Issuance

Green Bond Issuance Cumulative, in USD billion 2014 to 2021



Source: Climate Bonds Initiative (2022).

Figure 4.11. Green Bond Issuance: Yearly Issuance by Issuer Type



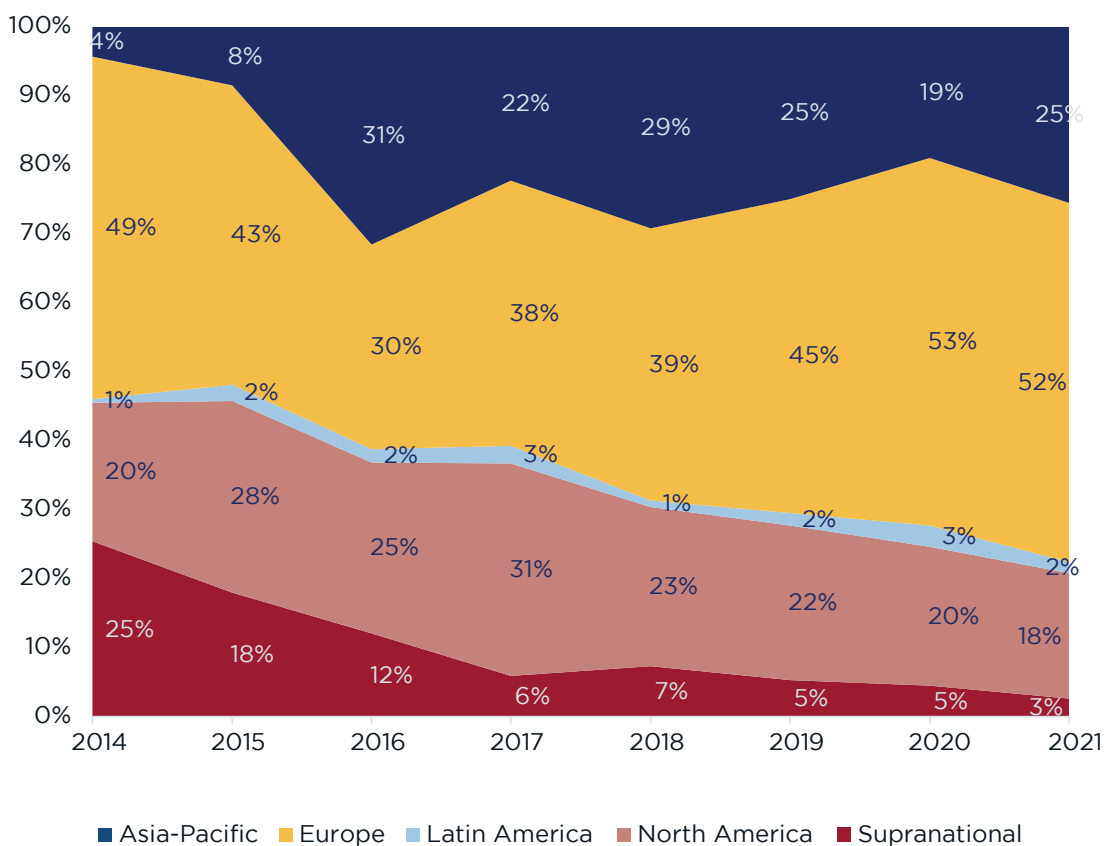
ABS = asset-backed securities.

Source: Climate Bonds Initiative (2022).

Every year, the development bank share of issuance decreased sharply, from 40% in 2014 to 7% in 2021. Over the same period, public sector issuers (sovereign, local government, government-backed) increased their share from 15% to 21%, while corporate issuers raised theirs from 44% to 59%.

From a regional perspective, while Europe accounts have maintained their lead, with about half of total green bond issuance, the Asia-Pacific region is approaching 30%, dominated by large issuances from China. Once market pioneers, supranationals have seen their share decrease to about 4% of total issuance.

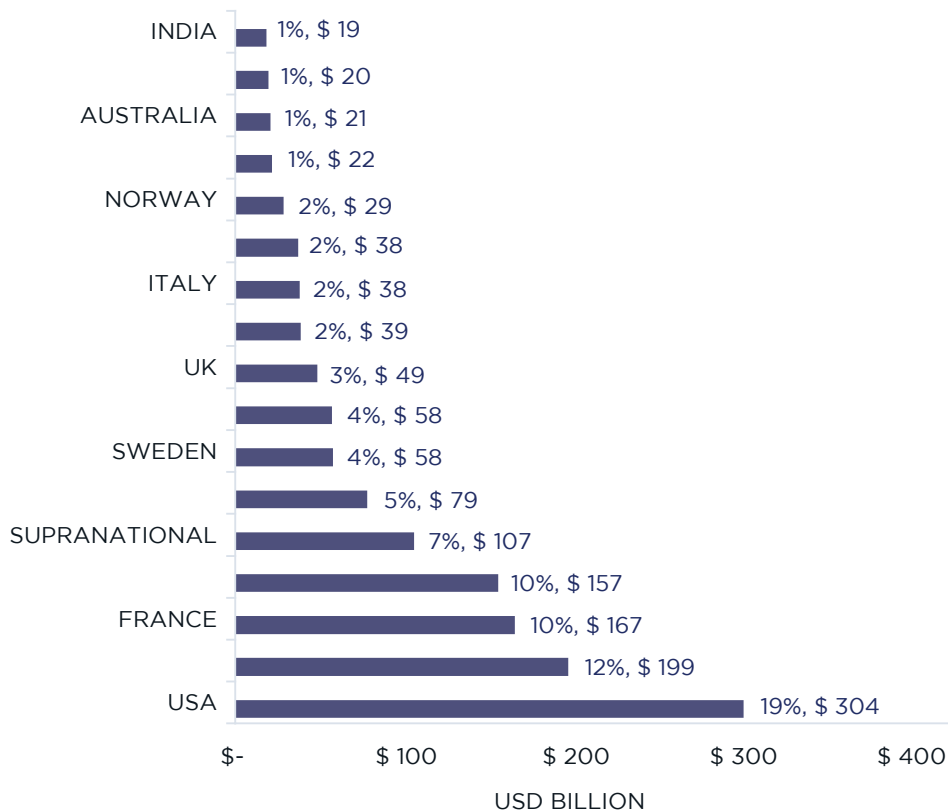
Figure 4.12. Green Bond Issuance: Issuance Over Time by Region



Source: Climate Bonds Initiative (2022).

From a country perspective, the US, China, France, Germany and the Netherlands are the top five issuers to date, sharing 60% of cumulative issuance.

The evolution of credit ratings of green-bond issuers tells a noteworthy story. The Standard and Poor’s (S&P) graph shows a steady transition, from an investment-grade concentration, with nearly 90% of market share in 2014, to a more diversified pool of issuers, reflecting the increased market participation and the broader market’s characteristics. From 2014 to 2018, AAA issuance fell from over 50% to 24%, with non-investment-grade issuers increasing to 20%.

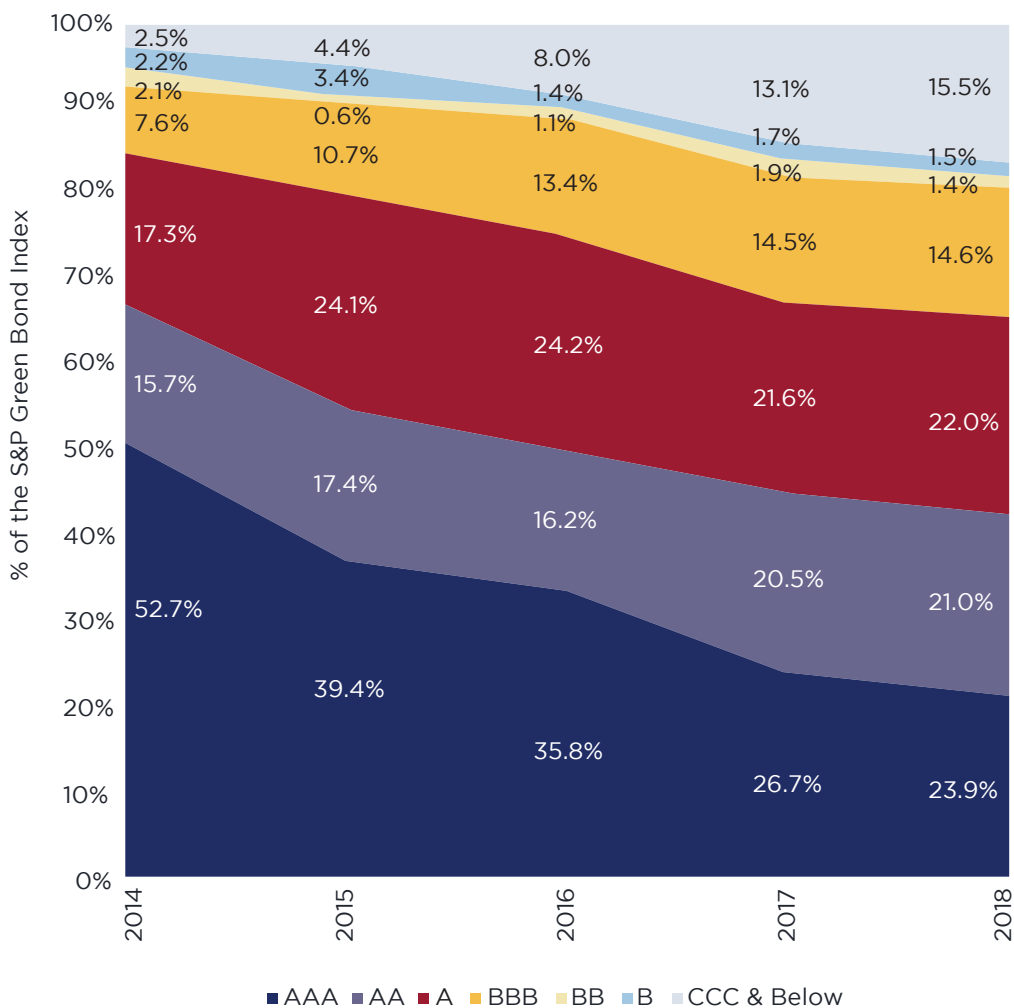
Figure 4.13. Green Bond Issuance: Cumulative, by Issuing Country

Source: Climate Bonds Initiative (2022).

An interesting debate is ongoing about the presence—or not—of a “greenium,” that is, the price differential between conventional and green bonds issued by the same issuer. In an abstract market, the price of a bond is determined by the level of credit risk that the issuer represents for investors. Hence, the price of a conventional bond should be no different from a green bond when the same issuer issues both. However, evidence is growing that a greenium may exist, driven by excess demand for green bonds from investors and asset managers and by a lagging supply response.

Any evidence of a greenium is critical because, if it exists, it would incentivize new and larger green bond issuances and help offset the additional costs and requirements of issuing green bonds. However, bond pricing is subject to market conditions at the time of issuance, making the greenium difficult to pinpoint accurately. Yet, two sovereign issuers rendered that comparison possible: Germany (in 2021) and Denmark (in 2022) announced their “twin bond” initiatives, whereby they simultaneously issued green and conventional bonds with the same characteristics. The primary objective was to increase the liquidity of green bonds by enabling green to conventional bond swaps.

Figure 4.14. Credit Rating of Green Bonds Over Time



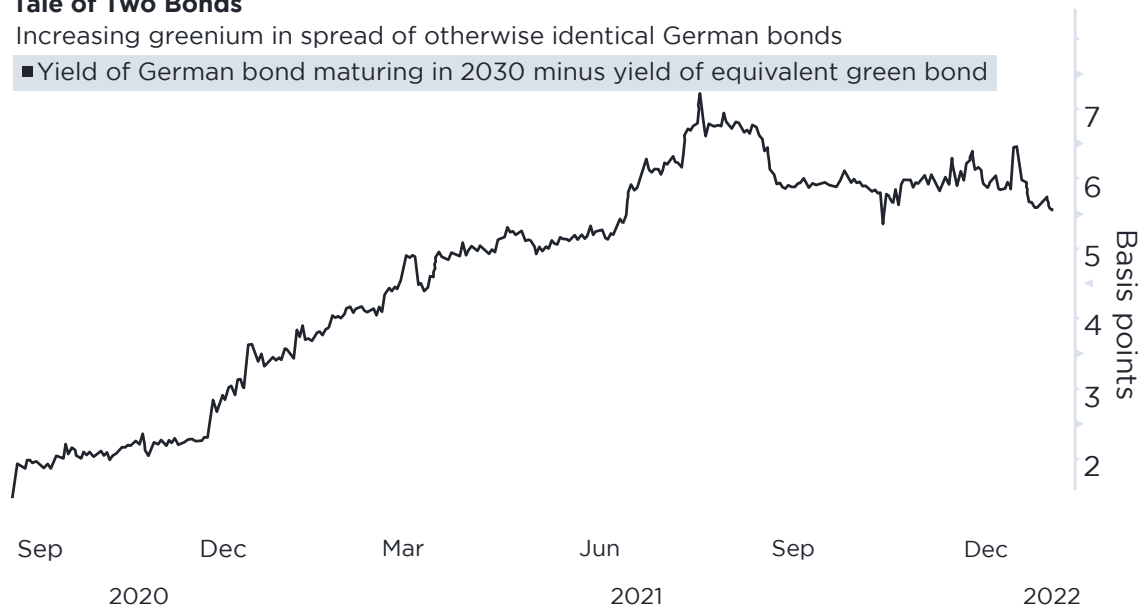
Source: Standard and Poor's (2019).

The outcome of the twin bond initiatives has helped track the spread between green and conventional bonds in the primary and secondary markets. In the primary market (at the time of the issuance), a greenium of one to two basis points was confirmed, while Germany's secondary market spread rose as high as seven basis points in September 2021 (Bloomberg 2022) (Figure 4.15), confirming the earlier views of market participants, some of which are highlighted in Figure 4.16.

Figure 4.15. Green vs. Plain Bond Spreads**Tale of Two Bonds**

Increasing greenium in spread of otherwise identical German bonds

■ Yield of German bond maturing in 2030 minus yield of equivalent green bond

**Figure 4.16. Selected Market Views on the “Greenium”**

The premium on green bonds—or the “greenium”—is evident globally and particularly strong for US dollar debt. Savings for borrowers range from one to 10 bps globally (**S&P**, September 2020, based on CBI research).

- Euro: Average oversubscription was 2.9x for green bonds and 2.6x for vanilla equivalents (**S&P**).
- US dollar: Average oversubscription was 4.7x for green bonds and 2.5x for vanilla equivalents (**CBI**, January to June 2021 pricing analysis).

Investor demand for green bonds has continued to drive pricing perks for KfW from its green note program. Greenium on its green bonds when first issued stood at around one bps compared with its conventional bonds. For 2021, however, primary market greenium was heading toward two bps (**KfW**).

bps = basis point, CBI = Climate Bonds Initiative, S&P = Standard and Poor's.

Source: S&P and CBI, 2021.

Social bonds. These are debt securities that raise capital to finance projects whose objective is to solve or mitigate specific social issues and/or achieve positive social outcomes, especially, but not exclusively, for a target population. Project categories can include providing and/or promoting affordable basic infrastructure, access to essential services, affordable housing, job creation, food security or socioeconomic advancement and empowerment. Examples of target populations include people living under the poverty line, marginalized communities, people with disabilities, the undereducated or unemployed, women and/or gender minorities and vulnerable groups. As with green bonds, ICMA (updated June 2021) publishes Social Bond Principles⁷³, which helps issuers prepare their frameworks.

Social bonds can be broken down into four broad types:

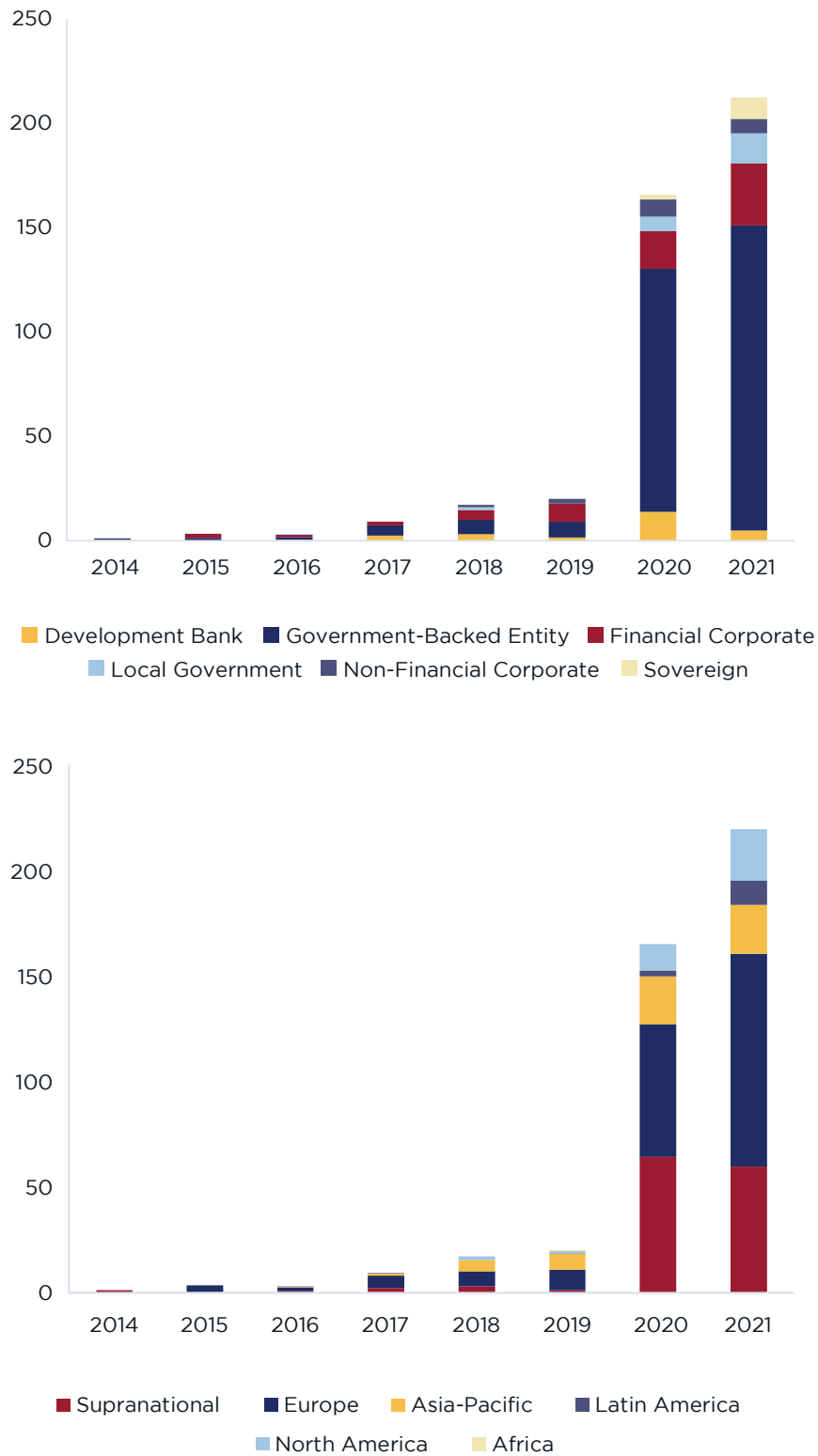
1. **Standard social use-of-proceeds bond.** A standard recourse-to-the-issuer debt obligation aligned with ICMA's Social Bond Principles.
2. **Social revenue bond.** A non-recourse-to-the-issuer debt obligation in which the credit exposure in the bond is to the pledged cash flows of the revenue streams, fees, taxes and so on, and whose use of proceeds goes to related or unrelated social projects.
3. **Social project bond.** A project bond for a social project for which the investor has direct exposure to the risk of a project with or without potential recourse to the issuer.
4. **Social securitized and covered bond.** A bond collateralized by specific social projects, including but not limited to covered bonds, asset-backed securities and other structures. The first source of repayment is generally assets' cash flows. This type of bond includes, for example, covered bonds backed by social housing, hospitals and schools.

Initially small and slowly growing, the social bond market exploded in 2020 and 2021, driven mainly by supranationals and government-backed entities, mostly aiming to fund COVID-19 pandemic-related needs. Total cumulative issuance of social bonds stood at USD440 billion as of the end of 2021, of which 88% (USD386 billion) was issued in 2020 and 2021 alone.

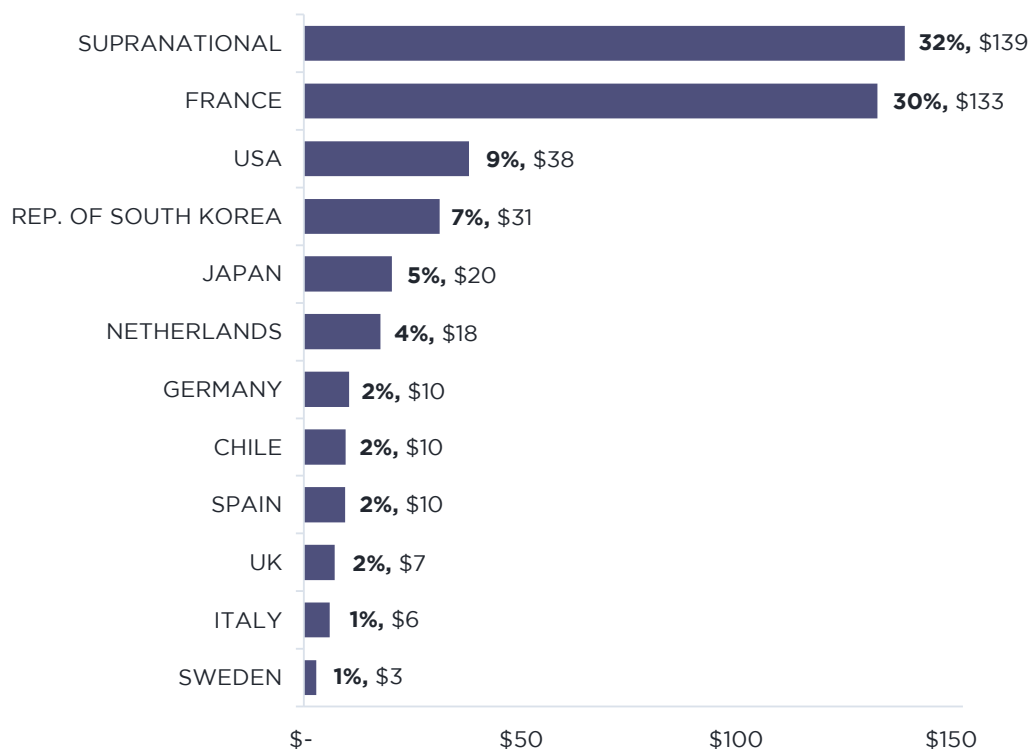
On a cumulative basis, supranationals issued 32% of all social bonds. With 30% of total issuance to date, France is the single largest contributor to the social bond market, while government-backed entities account for nearly 70% of total issuance in 2021.

⁷³ <https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/sustainability-bond-guidelines-sbg/>

Figure 4.17. Social Bonds: Issuance by Region and Issuer Type (USD billion)



Source: Climate Bonds Initiative (2022).

Figure 4.18. Social Bonds: Cumulative Issuance by Country, Top Issuers

Source: Climate Bonds Initiative (2022).

Blue bonds. These debt instruments raise capital, mostly from impact investors, to finance (1) marine and ocean-based projects that have positive environmental, economic and climate benefits, (2) implementation of SDGs related to the ocean, seas and marine resources, as well as the transition toward a sustainable ocean economy and (3) maintenance of the coastal ecosystem. Blue bonds are emerging as a new asset class that helps solve water-related challenges, create sustainable ocean business opportunities and signal responsible ocean stewardship.

Box 4.2. Seychelles: Issuer of the World's First Blue Bond

Seychelles is a small island country in the western Indian Ocean, highly dependent on marine resources. Fisheries employ about 17% of the population.

In 2017, the government launched efforts to build a diversified blue economy with the Third South West Indian Ocean Fisheries Governance and Shared Growth Project to transition fisheries to sustainable practices, governance and management.

In 2018, Seychelles issued a blue bond, raising USD15 million with institutional investors. The proceeds were used to finance the transition to sustainable fisheries and protect marine areas. USD5 million in concessional financing obtained from the Global Environmental Facility and a USD5 million guarantee from the World Bank enhanced the issuer's credit. The Rockefeller Foundation covered the transaction costs.

Source: World Bank (2022).

Blue bonds align well with the Green Bond Principles (ecological use of natural resources, land and underwater conservation of biological resources, water management, waste and wastewater treatment and adaptation to climate change) and Sustainable Bond Principles (creating jobs by financing small and medium-sized businesses and ensuring food safety). However, unlike other SDG-labelled bonds, blue bonds do not have their own guiding principles from a body such as ICMA.

Blue bonds are relatively new and remain rare, but climate change and environmental concerns are expected to continue pushing demand for structuring such operations. Developing guidelines and principles by ICMA or CBI would help solidify the bonds' expansion. Table 4.4 highlights some of the most important transactions since the first blue bond issuance in 2018.

Table 4.4. Recent Blue Bond Issuances

Date	Issuer	Blue Bond
October 2018	Republic of Seychelles	World's first sovereign blue bond Raised USD15 million to finance the sustainable use of marine resources
January 2019	Nordic Investment Bank (NIB)	A five-year SEK2 billion Nordic-Baltic Blue Bond to support bank lending to selected water management and protection projects in the Baltic Sea
April 2019	World Bank	A callable step-up fixed-rate bond that raised USD10 million to draw attention to plastic waste pollution in oceans
October 2020	NIB	SEK1.5 billion Nordic-Baltic Blue bond due in October 2025
November 2020	Bank of China	First blue bond from the private sector, first from a commercial bank and first from Asia A dual-currency bond that raised the equivalent of USD942 million to protect the oceans
September 2021	Asian Development Bank (ADB)	First-ever dual-tranche blue bond in Australian dollars (10 years, USD151 million) and New Zealand dollars (15 years, USD151 million) to finance ocean-related projects in Asia and the Pacific. The bonds were issued under ADB's expanded Green and Blue Bond Framework.

Source: NASDAQ (2021) and author.

Gender bonds. These are a type of social bond to raise awareness of and tackle gender inequality and empower women. Gender bonds provide funding for companies and projects that focus on gender issues. Companies include those that are headed or owned by women, promote workplace gender equality and develop products and services that improve women's quality of life. Surprisingly, no sovereign has ever issued a gender bond.

ICMA, jointly with United Nations Women and the International Finance Corporation, has issued guidelines for gender bonds. The guidelines list potential initiatives to be funded by gender bonds, including the following:

1. Create a dedicated portfolio of responsible financial offerings that benefit women, such as loans, mortgages and insurance products.
2. Provide coaching, leadership and mentoring programs to strengthen the pipeline of female talent.

3. Update workplace facilities to be more family-friendly by, for example, providing childcare facilities or breastfeeding rooms.
4. Improve awareness of and accessibility to services that prevent and respond to violence against women and girls, including sexual harassment.

Box 4.3. IDB Invest's Gender Bond

In March 2021, IDB Invest—the arm of the Inter-American Development Bank oriented toward the private sector—issued a gender bond to finance projects to promote gender equality, empower women in Latin America and help advance United Nations Sustainable Development Goal 5 (gender equality).

The proceeds aim to close the financing gap for more than 1,200 women-led micro, small and medium-sized enterprises in Mexico. According to the national survey on financial inclusion, 46% of women do not have any credit.

- IDB Invest's gender bond was the first such bond issued by a multilateral development bank in Latin America and the Caribbean.
- The MXN2,500 million bond (about USD122 million) was issued in Mexico, with a three-year maturity.
- It was the second issuance by IDB Invest under its sustainable debt framework, complying with the Green Bond Principles and Social Bond Principles (International Capital Market Association).
- Second-party opinion was obtained from Vigeo Eiris.
- The bond received a local credit rating of mxAAA by Standard and Poor's and Moody's.
- The transaction was 1.5 times oversubscribed.

Investor allocation: investment funds (64%), government institutions (22%) bank treasuries (8%).

Source: IDB Invest (2021).

Gender-focused bonds are relatively new and remain rare, even as the market for sustainable debt, including green and social bonds, grows at a record pace. The breadth of standards and guidelines for the bonds is limited but is being developed. The first step is *Bonds to Bridge the Gender Gap: A Practitioner's Guide to Using Sustainable Debt for Gender Equality* (ICMA, International Finance Corporation and UN Women 2021). It lays the foundation for key indicators for gender bonds and focuses on the following areas:

- 1. Leadership.** Are there opportunities to commit to increasing gender equality on the issuer's board or in management or other leadership roles?
- 2. Employees.** Are there opportunities to commit to increasing gender equality in retention, pay, promotion and so on? What family-friendly policies, services and benefits could be put in place? Beyond the basic standards, what policies or procedures could be implemented to create a safer and more respectful workplace?
- 3. Supply chains.** Could procurement from women-owned and/or -led businesses be increased or more women-owned distributors integrated into the issuer's

distribution network? How much of the supply chain could adopt standards for gender-responsive companies and/or gender-sensitive policies?

4. **Products and services.** Are there opportunities to increase the number of products and services designed to have a positive social impact on women consumers or users? Could the share of women customers be increased for beneficial products?
5. **Community engagement.** Are there opportunities to achieve a gender balance in community engagement and programs? Could the number of women participants in decision-making roles be increased?

Sustainability bonds. These are debt instruments whose proceeds or an equivalent amount will be exclusively applied to finance or refinance a combination of green and social projects. The total cumulative size of this market surpassed USD500 billion by the end of 2021. Development banks, especially the World Bank, dominate the sustainability theme, reaching about 65% of overall volume in 2020 and 48% of cumulative issuance to date. Several multilateral development banks have decreased green issuances in favor of sustainability and social debt to mitigate the impacts of the COVID-19 pandemic.

Sustainability-linked bonds. These are a type of instrument for which financial and/or structural characteristics change (most commonly the coupon) depending on whether the issuer achieves predefined sustainability and/or SDG objectives. Issuers commit explicitly (including in the bond prospectus) to future improvements in sustainability outcomes within a predefined timeline. As such, the bonds are a forward-looking performance-based instrument. The objectives are measured through predefined KPIs and assessed against predefined sustainability performance targets (SPTs). The bond's coupon rate will be determined by the issuer's ability to achieve those objectives within the contractual timeline.

A key distinction from other thematic bonds is that a sustainability-linked bond's (SLB) categorization is not determined by use of proceeds but by outcome measured through KPIs and SPTs. Hence, the proceeds are intended for general purposes and do not require ring-fencing. Issuers can follow ICMA's SLB principles.

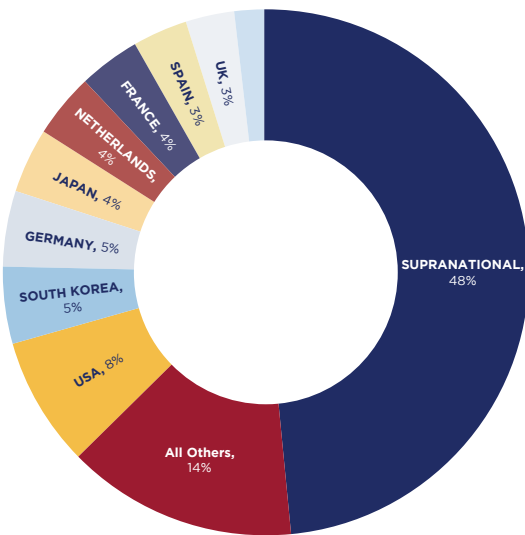
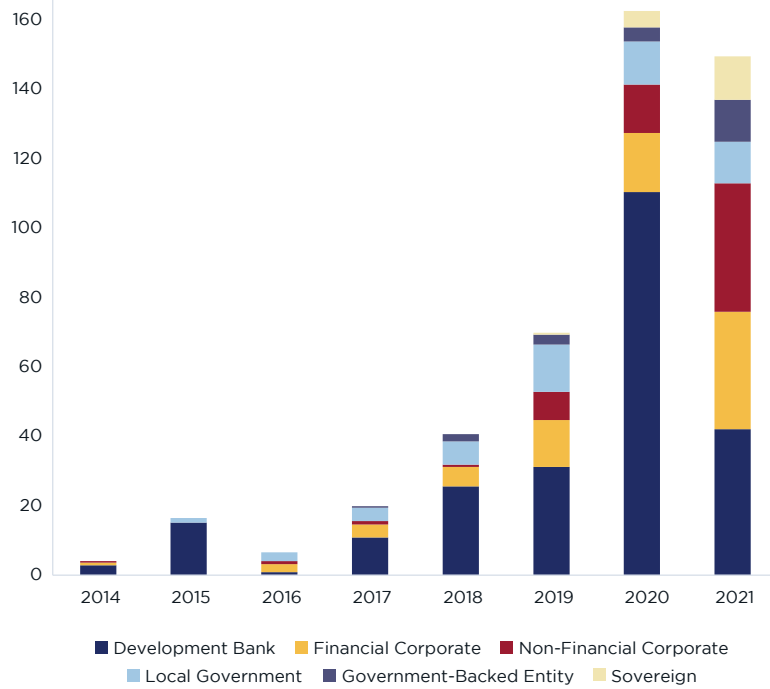
Another key distinction is that independent verification is required, as it becomes part of the cost of funding, given the performance-based coupon that is contractually determined in the bond documentation. For other thematic bonds, third-party verification is optional.

Given the importance, for both issuer and investor, of selecting KPIs, the World Bank identified five high-level criteria for assessing the robustness of the data that underpin any KPI chosen by sovereigns for their SLBs:

1. **Availability.** Are the data available at a reasonable cost or publicly available for the foreseeable future?
2. **Attributability.** Can the indicator be plausibly associated with sovereign interventions?

- 3. **Frequency.** Are the data current and produced with enough frequency?
- 4. **Regularity.** Are the data provided regularly and over a considerably long period?
- 5. **Comparability.** Are the data within data sets consistent across countries?

Figure 4.19. Sustainability Bonds, by Issuer Type and Country (USD billion)



Source: Climate Bonds Initiative (2022).

The SLB market is in its infancy, but investor interest is strong, with 84% of demand coming from Europe, the Middle East and Africa. Two key events helped boost awareness and interest in SLBs: ICMA’s publication of the SLB principles in 2020 and the European Central Bank’s buying of SLBs in 2021.

To date, SLB issuance has been dominated by corporate issuers: CBI (2021) reports that in 2021, 93% of SLBs were issued by the corporate sector and 7% by government-backed entities. Italy leads the market with nearly USD25 billion issued in 2021, double the amounts issued by France, China and Germany, of which almost 70% came from the Italian utility company Enel.

The World Bank reports that governments are increasingly considering sovereign SLBs to resolve the triple crises of unprecedented debt levels, climate change and nature loss. In March 2022, the government of Chile became the world's first sovereign issuer of an SLB. The USD2 billion bond offering is linked to two KPIs: a specific target for absolute greenhouse gas emissions and half of electric power generation achieved from nonconventional renewable energy sources over the next six years, increasing to 60% by 2032 (BNP Paribas, 2021).

Box 4.4. Eni Sustainability-Linked Bond

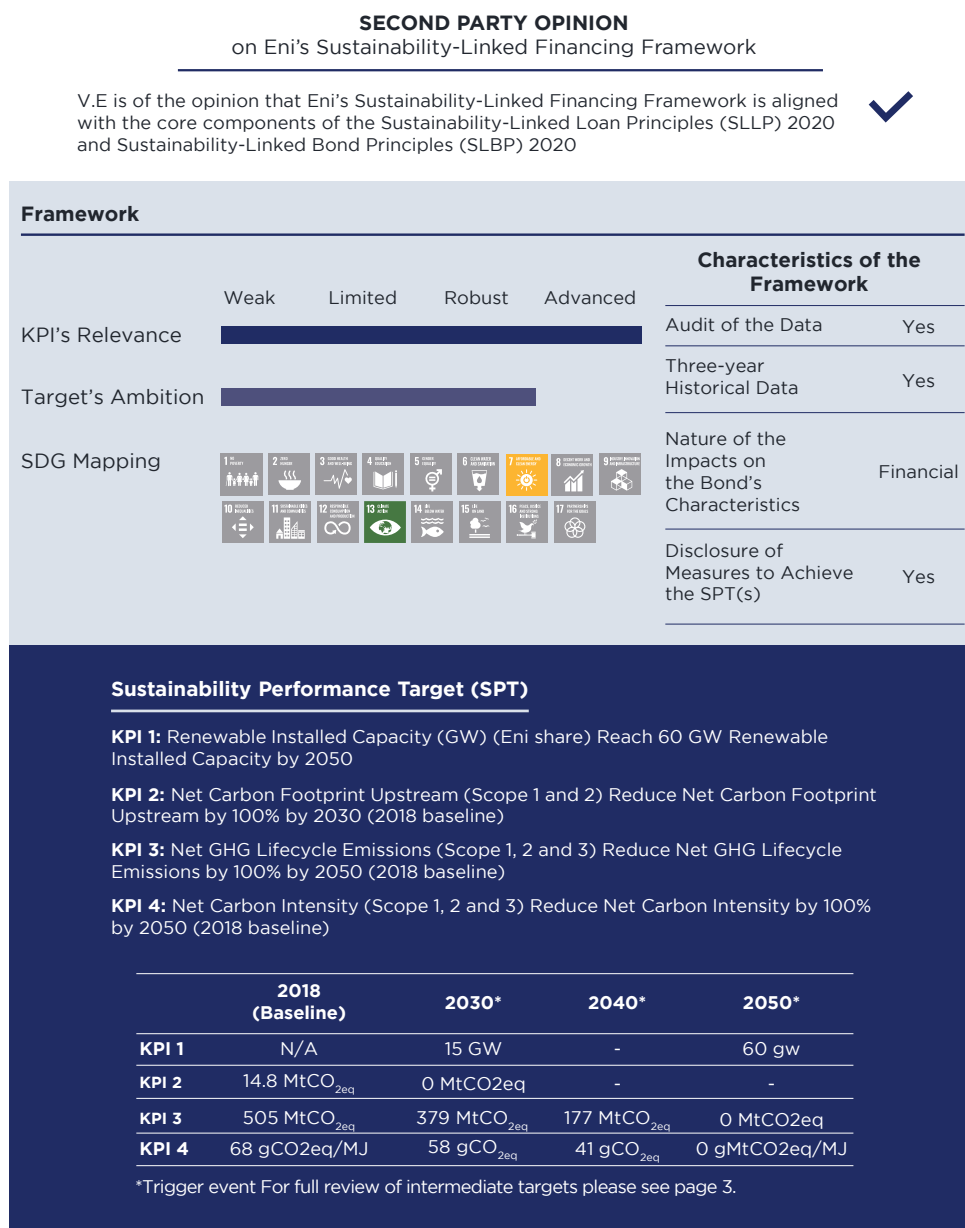
Italy's power company Eni issues bonds to support SDG 7 (affordable and clean energy) and SDG 13 (climate action).

- In June 2021, Eni launched the first sustainability-linked bond (SLB) in the power sector for a nominal amount of EUR1 billion.
- The SLB was placed in the international Eurobond market after the adoption by Eni of the International Capital Market Association's Sustainability-Linked Financing Framework published on May 20, 2021.
- The seven-year bond has a re-offer price of 99.855% and pays a fixed annual coupon of 0.375%.
- The proceeds of the bond issue will be used for general corporate purposes.
- The bond will be traded on the Luxembourg Stock Exchange.
- The notes were bought by institutional investors mainly in France, Germany, the United Kingdom and Italy.
- Key performance indicator (KPI) 1. Increase renewable energy installed capacity to at least 5 gigawatts (GW) by the end of 2025 versus 0.3 GW in 2020.
- KPI 2. Lower net greenhouse gas emissions of upstream activities to at least 7.4 million tons by the end of 2024, or -50% versus 2018.
- Eni failing to reach one or both sustainability performance targets will cause the coupon on the bond to increase by 0.25%.

Source: Eni (2021).

Third-party verification is critical for SLBs as it determines the bond's final coupon. Figure 4.20 is an extract from the verification entity's initial report on Eni's SLB.

Figure 4.20. Eni Sustainability-Linked Bond Second Party Opinion



Source: Eni, 2021.

Sukuk bonds. A sukuk is the Islamic equivalent of a bond and the most prevalent capital market instrument in Islamic finance. Sukuk bonds follow sharia principles and jurisprudence and adhere to the three principles that govern Islamic finance (IMF 2015):

- Equity**, which scholars generally invoke as the rationale for prohibiting predetermined payments (*riba*) to protect the weaker contracting party in a financial transaction. *Riba*—“hump” or “elevation” in Arabic—is an increase in wealth that does not result from productive activity. Equity is the basis for prohibiting excessive uncertainty (*gharar*) as manifested by contract ambiguity or elusiveness of payoff. Transacting

parties have a moral duty to disclose information before engaging in a contract, thereby reducing information asymmetry; the presence of *gharar* would nullify the contract.

2. **Participation**, commonly known as interest-free financing, although the prohibition of *riba* does not imply that capital is not to be rewarded. According to a key sharia ruling that reward (profit) comes with risk-taking, investment return must be earned in tandem with risk-taking and not with the mere passage of time, which is the basis of prohibiting *riba*. Return on capital is legitimized by risk-taking and determined *ex post* based on asset performance or project productivity, thereby ensuring a link between financing and real activities. Participation lies at the heart of Islamic finance, ensuring that increases in wealth accrue from productive activities.
3. **Ownership**, embodied in the rulings of “Do not sell what you do not own” (for example, short-selling) and “You cannot be dispossessed of a property except on the basis of right,” which mandate asset ownership before transacting. Islamic finance has come to be known as asset-based financing, forging a robust link between finance and the real economy. Islamic finance requires preservation and respect for property rights and upholding contractual obligations by underscoring the sanctity of contracts.

Sukuk bonds are identical to conventional bonds in that most are asset-based securities, senior unsecured debt obligations that clear through Euroclear and/or Clearstream, have periodic coupon payments and a bullet maturity, which are key characteristics of a traditional capital market instrument. Because of the asset-linked nature of Islamic finance, sukuk are structurally required to have an underlying asset that can be a pool of assets or services (the “underlying pool”).

Like conventional unsecured bonds with similar risk profiles, asset-based sukuk do not confer ownership rights in an underlying asset. Instead, an undivided beneficial ownership interest is extended only to comply with sharia principles without any material implication on the nature of the contractual relationship between the issuer, the underlying assets and the investor.

In a sukuk, as in a conventional bond, there is only a contractual claim against the issuer. The investor takes only the primary credit risk of the sukuk issuer, which is obliged to pay the sukuk holder irrespective of the underlying asset’s performance.

A key difference between sukuk and conventional bonds is that in a sukuk bond, the issuer undertakes additional internal efforts to comply with sharia principles. This entails additional legal documentation that needs to be approved by a sharia board and the availability of a sufficient amount of sharia-compliant assets (excluding the prohibited sectors such as alcohol and weapon industries) to be used as the underlying pool.

Asset-backed sukuk have historically been much rarer, mainly because they are riskier as investors are fully exposed to the performance risk of the underlying pool of assets. These bonds are similar to traditional asset-backed securities, although with sharia-compliant assets.

Table 4.5. Islamic Financing Techniques

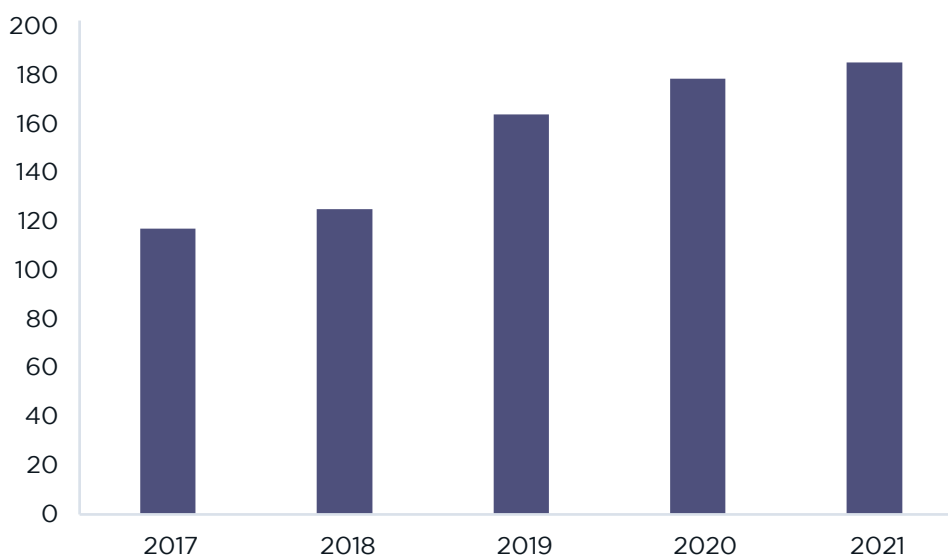
Mode	Contract	Underlying Assets and Returns
Lease	Ijārah	Underlying assets: Buildings, land, machinery, property Returns: Lease payments
Partnership	Mushārahah	Underlying assets: Services, businesses, etc. Returns: Profit and loss sharing
Investment	Muḍārahah	Underlying assets: Projects, services, etc. Returns: Profit and loss sharing
Build order	Istiṣnā'	Underlying assets: Roadways, power plants, etc. Returns: Contractual profit
Agency	Wakālah	Underlying Assets: Services, businesses, etc. Returns: Return on investment

Source: Islamic Development Bank (2022).

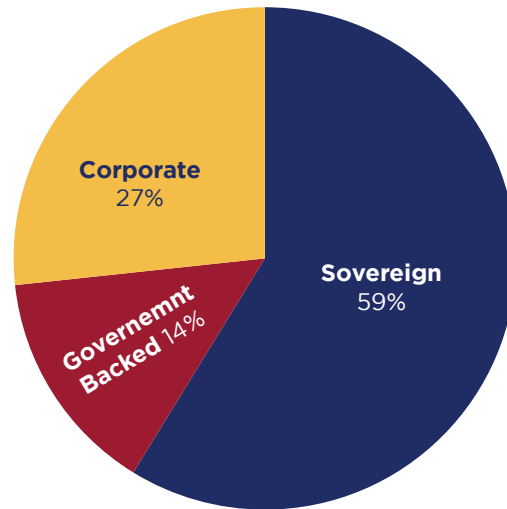
Usually, sukuk are characterized by the nature of the contract they use in linking the underlying assets, which could be any of the main Islamic modes of financing (Table 4.5).

Through a sukuk issuance, governments or corporations raise sharia-compliant external capital to finance the underlying pool of assets, and investors earn income from the cash flows generated from it.

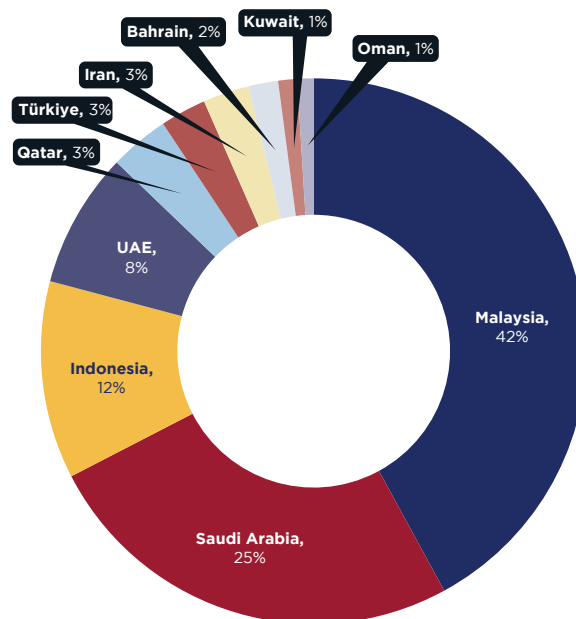
The concept is similar to securitization, with the difference that the securitized asset is not a debt obligation and is sharia compliant. The underlying assets are usually transferred as a trust to a special purpose vehicle, which acts as the trustee for the investors (sukuk holders).

Figure 4.21. Sukuk Bonds: Issuance per Year (USD billion)

Source: Refinitiv (2022).

Figure 4.22. Sukuk Bonds: Issuance by Issuer Type

Source: Refinitiv (2022).

Figure 4.23. Sukuk Bonds: Share of Market by Issuing Country

Source: Refinitiv, 2022.

Total sukuk issuance reached USD185 billion in 2021 (Figure 4.21), largely in the public sector, with 59% issued by sovereign entities (Figure 4.22). Malaysia and Saudi Arabia account for nearly 70% of the market (Figure 4.23).

The sukuk market is growing as issuers branch out into green, social and sustainability issuances. More than USD6 billion of green sukuk have been issued by corporates, sovereigns and supranationals. Sustainability sukuk emerged as issuers

and investors focused on social sectors such as health care and social benefits during the COVID-19 pandemic.

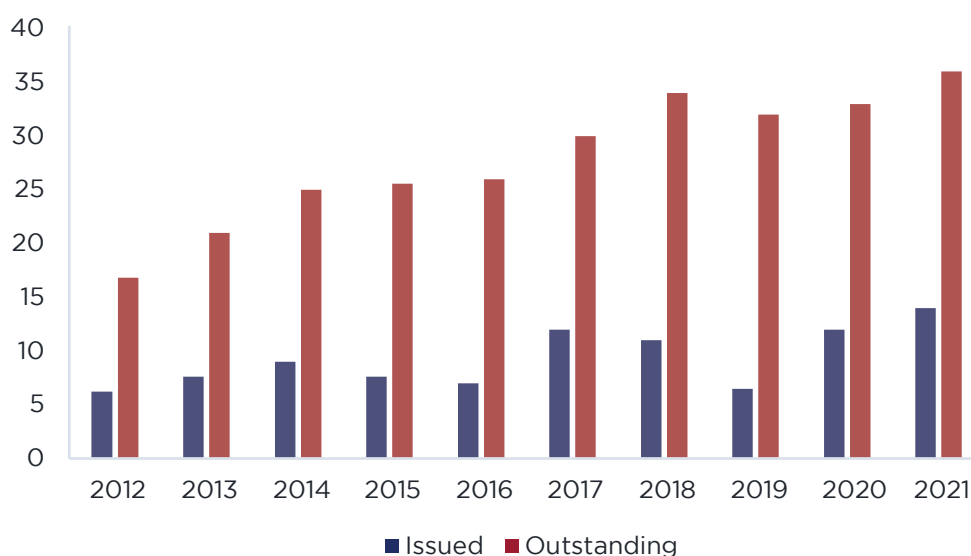
The sukuk market is steadily growing, but several challenges could hamper its expansion. Standardized documentation has been slow to develop, which can have adverse cost implications. A secondary market that remains illiquid outside key Islamic finance domiciles limits investors' ability to trade sukuk instruments. The tax treatment of sukuk bonds may be dissimilar to that of conventional bonds in certain jurisdictions, resulting in uncertainty.

Innovation in the sukuk market is slow because sharia scholars must ensure compliance of nonstandard transactions. Malaysia and the United Arab Emirates have established central sharia boards. Still, an absolute, unified and settled body of opinion does not exist, and sharia scholars may have differing views, adding cost and unpredictability.

4.2.8. Catastrophe bonds

Catastrophe (CAT) bonds, also called insurance-linked securities, enable entities exposed to natural disaster risk to transfer that risk to bond investors. In a typical CAT bond structure, the entity exposed to the risk (the sponsor) issues a bond for which it pays interest. But the proceeds are held by a special purpose vehicle in escrow. If a specified natural disaster occurs during the bond term, some or all of the proceeds held by the special purpose vehicle are released to the sponsor, with no obligation to repay them. If no event occurs, the proceeds are returned to the bondholders on the bond's maturity date. In effect, the interest paid along the way (the coupon) acted as the insurance premium. CAT bonds have become a major tool for fiscal risk management (Figure 4.24). One compelling case of a sovereign use of CAT bonds is the Pacific Alliance CAT bond (Box 4.5), where its members—Chile, Colombia, Mexico and Peru—secured coverage for earthquakes and hurricanes in a deal structured by the World Bank (see chapter 5).

Figure 4.24. Catastrophe Bonds: Amounts Issued and Outstanding per Year



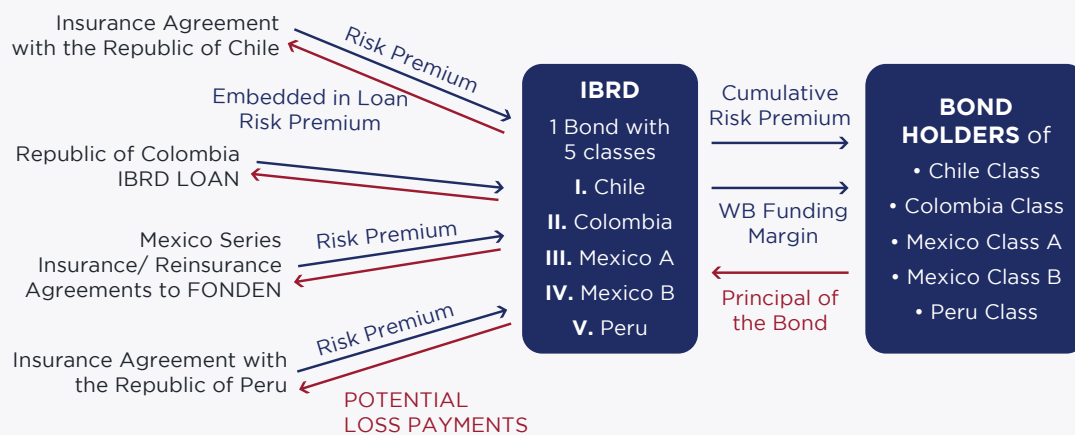
Source: Artemis.bm (2022).

Box 4.5. World Bank Pacific Alliance Catastrophe Bond

- In 2018, the governments of Chile, Colombia, Mexico and Peru issued jointly, through the World Bank, a catastrophe (CAT) bond to protect themselves against losses caused by earthquakes and hurricanes.
- The USD1.36 billion CAT bond covered the countries for up to three years.
- It was the first CAT bond to cover four countries at once.
- The World Bank acted as advisor, structurer, intermediary, issuer and manager of the premiums and proceeds.
- Each country customized the terms of its insurance coverage (type of risk, severity of risk, period, amount and so on).

Pacific Alliance Countries Joint Cat Bond

Transaction Structure



Transaction Summary

Nominal amount:	USD1,360,000,000 (with USD2,500,000,000 in orders)
Classes:	Chile -USD500 million Colombia -USD400 million Mexico (a) -USD160 million Mexico (b) -USD100 million Peru -USD200 million
Tenor:	The nominal amount is reduced fully or partially as a result of an applicable earthquake event in the covered countries 3 years for Chile Colombia and Peru, 2 years for Mexico

Source: World Bank (2018).

4.3. Roles of Regional and Domestic Development Banks

Development banks play a fundamental role in promoting the sound use and scaling of financial instrument markets that help public sector debt managers raise funds and manage risk efficiently. The banks could carry out the following:

Provide technical assistance to share knowledge, experiences and best practices through general or client-specific assessments, research, workshops and events. Development banks can finance some of the costs associated with these instruments (such as research, assessments, fees) from their own budgets or through trust funds.

Create and support practice communities to gather experts, practitioners and scholars for focused discussions. For example, the Understanding Risk Community,

managed by the World Bank, gathers more than 13,000 experts and practitioners from 209 countries and 4,600 organizations that assess and mitigate natural disasters. The Public Debt Management (PDM) Network, an initiative of the Organisation for Economic Co-operation and Development, Italy's Treasury and the World Bank, builds and shares knowledge on public debt management. The Multilateral Cooperation Center for Development Finance, an initiative of the Asian Infrastructure Investment Bank, promotes high-quality infrastructure and connectivity investments in developing countries through partnerships.

Support establishing and adopting global standards by publishing guidelines, procedures and/or best practices to put public debt managers on sound footing to adopt and utilize new instruments and practices.

Box 4.6. Special Considerations for Infrastructure Financiers

Green bonds were conceived by development banks as project-based investment vehicles to finance clean energy and infrastructure. From the start, the use of proceeds has been a critical component of the eligibility requirements, and strong procedures and guidelines were developed for ring-fencing, tracking and reporting on the use of funds. Of the instruments discussed in this section, green bonds are the most directly linked to infrastructure. More than 94% of green bonds issued in 2021 were to finance energy, buildings, transport and water infrastructure.

Other thematic bonds can focus on infrastructure finance but may include a broader set of project-funding needs such as general-purpose funding and technical assistance. Infrastructure components include building waste management plants to reduce coastline pollution (blue bonds) and constructing health facilities in underserved communities (social bonds). Sustainable bonds may include any green or social infrastructure.

Gender, sukuk and sustainability-linked bonds are less focused on infrastructure finance. Gender bonds, while still in their early phase, concentrate on general-purpose financing and technical assistance, while sustainability-linked and sukuk bonds are used mainly for general funding.

Other instruments are intended to manage risk in a liability portfolio, regardless of the purpose of the underlying financing. Debt swaps and buybacks, currency and interest rate swaps, debt-for-nature swaps, contingent loans and CAT bonds can be used for infrastructure or any other project to manage risk.

4.4. Conclusion

The instruments highlighted in this section form part of the tool kit available to public sector debt managers in their mission to raise funding and manage risk simultaneously. Debt swaps and buybacks, debt-for-nature swaps and derivatives can be used to modify the financial characteristics of the existing debt portfolio and reduce risk on an *ex post* basis. Thematic, CAT and sukuk bonds can help raise funds for specific purposes while diversifying the pool of potential investors on an *ex ante* basis.

These instruments require various degrees of preparation to build technical capacity and knowledge of the markets where they operate. Third-party advisors are often needed to ensure that the instruments are used efficiently. Multilateral and domestic development banks have a critical role in the sound adoption of these instruments by providing technical assistance, promoting knowledge communities and leading the dissemination of global guidelines and standards.

References

- Medeiros, C. Polan, M. Ramlogan, P. 2007. A Primer on Sovereign Debt Buybacks and Swaps. IMF Working Paper WP/07/58. www.imf.org/external/pubs.
- Blommestein, H. Elmadag, M. Wellendorph, J. 2012. Buyback and Exchange Operations: Policies, Procedures and Practices among OECD Public Debt Managers. OECD. <https://www.oecd-ilibrary.org>.
- Mardi, M. 2020. Pioneering the Green Sukuk: Three Years On. The World Bank. <https://www.worldbank.org/en/country/malaysia/publication/pioneering-the-green-sukuk-three-years-on>.
- International Capital Markets Association. 2022. Green Bond Principles. <https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/>.
- International Capital Markets Association. 2022. Social Bond Principles. <https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/>.
- International Capital Markets Association. 2021. Sustainability Bond Principles. <https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/>.
- International Capital Markets Association. 2020. Sustainability-Linked Bond Principles. <https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/>.
- International Capital Markets Association. 2021. Green Project Mapping. <https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/>.
- Soe, A. Xie, H. Luke, B. Horan, K. 2019. A Look Inside Green Bonds: Combining Sustainability with Core Fixed Income. S&P Global. <https://www.spglobal.com/en/research-insights/articles/a-look-inside-green-bonds-combining-sustainability-with-core-fixed-income>.
- Climate Bonds Initiative. 2019. Climate Bonds Standard Version 3.0. <https://www.climatebonds.net/files/files/climate-bonds-standard-v3-20191210.pdf>.
- Climate Bond Initiative. 2021. Climate Bonds Taxonomy. <https://www.climatebonds.net/standard/taxonomy>.
- Climate Bond Initiative. 2021. Sovereign Green, Social, and Sustainability Bond Survey. <https://www.climatebonds.net/resources/reports/sovereign-green-social-and-sustainability-bond-survey>.
- United Nations Environment Programme Finance Initiative. 2021. United Nations' Sustainable Blue Finance Initiative: Mobilising Capital for a Sustainable Ocean. <https://www.unepfi.org/blue-finance/>.
- Asian Development Bank. 2021. Sovereign Blue Bonds: Quick Start Guide. <https://www.adb.org/publications/adb-blue-bonds>
- Blanco-Iturbe, A. 2021. Accelerating Blue Bonds Issuances in Latin America and the Caribbean, IDB Invest. <https://www.idbinvest.org/en/publications/accelerating-blue-bonds-issuances-latin-america-and-caribbean>
- Chao, F. 2021. Bonds to Bridge the Gender Gap: A Practitioner's Guide to Using Sustainable Debt for Gender Equality. ICMA, UN Women, and International Finance Corporation. <https://www.unwomen.org/en/digital-library/publications/2021/11/bonds-to-bridge-the-gender-gap>

- International Capital Market Association. 2021. Pre-issuance Checklist for Social Bonds/ Social Bond Programmes. <https://www.icmagroup.org/assets/documents/Sustainable-finance/2021-updates/Pre-issuance-Checklist-for-Social-Bonds-and-Social-Bond-Programmes-June-2021-100621.pdf>
- Keenan, C. 2021. The World Bank Sustainable Development Bonds & Green Bonds; Impact Report. The World Bank. <https://treasury.worldbank.org/en/about/unit/treasury/impact/impact-report>
- Hussain, M. Shahmoradi, A. Turk, R. 2015. An Overview of Islamic Finance, IMF Working Paper WP/15//120, International Monetary Fund. <https://www.imf.org/external/pubs/ft/wp/2015/wp15120.pdf>
- Securities Commission Malaysia. 2019. Sustainable and Responsible Investment Sukuk Framework. <https://www.sc.com.my/api/documentms/download.ashx?id=84491531-2b7e-4362-bafb-83bb33b07416>
- International Islamic Financial Market. 2021. Sukuk Report: A Comprehensive Study of the Global Sukuk Market. <https://www.iifm.net/public/frontend/general-documents/bcd691cfb4233fb37d783550210103921635251580.pdf>.
- Adil, M. Al Ansari, R. 2021. Islamic Finance Development Report 2021. Refinitiv. <https://www.refinitiv.com/en/resources/special-report/islamic-finance-development-report>.

Chapter 5

Old and New Instruments for Fiscal Risk Management

Luis de la Plaza

Abstract

Exogenous shocks such as natural disasters and pandemics or sudden interest rate, currency and commodity-price adjustments can have an extremely negative impact on the fiscal balances of developed and developing economies alike. But emerging markets and developing economies have historically been the least equipped to prepare for and deal with the aftermath of exogenous shocks. To reduce developing economies' vulnerability to external shocks, governments must actively engage in programs of fiscal insurance. Governments must shift from an arcane *ex post* attitude to a more explicit *ex ante* approach and take advantage of a readily available full menu of products and services routinely used by developed economies. Development banks need to help meet developing economies' need for fiscal insurance measures, possibly by creating a specialized, independent, sole-purpose agency.

5.1. Introduction

In the financial world, risk management identifies, analyzes, accepts or mitigates uncertainty in investment decisions. Essentially, risk management occurs when an investor (e.g., a lender) analyzes and attempts to quantify the potential for losses in an investment (e.g., a loan) and then takes the appropriate action (or inaction) given their objectives and preferred level of risk tolerance.

Risk is inseparable from return. Every investment involves some degree of risk, considered exceedingly low in, say, United States (US) Treasury bills or extremely high in assets such as emerging-market equities or real estate in highly inflationary environments. Risk is quantifiable in absolute and relative terms. A solid understanding of risk helps investors better address the opportunities, trade-offs and costs involved in investment decisions.

For governments, risk can appear at many levels and needs to be understood within the context of project, subnational and national financing. In practice, interest, currency, commodity and natural disaster risks are the most prevalent. Some readily available financial products are specifically designed to reduce and manage those risks. Oddly, they have been notoriously underutilized, particularly among emerging markets and developing economies (EMDEs).

Sound fiscal risk management (1) improves debt sustainability and raises country creditworthiness, (2) enhances transparency and public accountability, (3) reduces volatility of inflows and outflows and (4) strengthens resiliency against shocks—both financial and natural disasters.

This chapter argues that governments need to shift their risk management from an arcane *ex post* approach (i.e., crisis response **after** a specific event) to a more explicit *ex ante* framework (i.e., risk reduction, mitigation, preparedness, insurance **before** the event occurs). The chapter reviews the tools that need to be deployed—and the obstacles that need to be removed to make the shift happen—and presents lessons from recent country experiences in managing fiscal risk. The overall message is simple: relying solely on “in crisis” responses can be costly, inefficient and difficult to finance and implement. Being proactive and prepared pays off.

Section 2 examines the causes behind governments’ timidity in hedging their fiscal risks and financiers’ reluctance to provide the hedges. Section 3 gives an account of the instruments—old and new—available in international financial markets to manage exogenous shocks and the ensuing volatility of fiscal accounts. Swaps are essential, and so is another key ingredient in the contracting process, which most emerging and developing countries lack: International Swaps and Derivatives Association (ISDA)-standard derivative agreements. Section 4 explores a selection of country cases that have succeeded at fiscal insurance—and the benefits that ensued—and its potential applicability to infrastructure projects. Section 5 concludes by exploring the essential role development banks or a potential multilateral insurance agency could play in closing the gap in fiscal insurance.

5.2. Fiscal Risk Management: An Opportunity Yet to be Seized

Sudden, unexpected changes in interest rates, currencies and commodity prices, as well as natural disasters can derail fiscal plans and shut down access to financing right when it is most needed. Nowhere is the possibility clearer and more poignant than in EMDEs, where unanticipated shocks can carry enormous costs regarding creditworthiness, access to financing, long-term growth and, ultimately, poverty reduction.

The costs beg the question: Why are EMDEs less actively involved in fiscal risk management? Constraints exist on the demand and supply sides. Five elements are usually missing on the demand side:

- 1. Adequate institutional framework and capacity.** Within a country's ministry of economy and/or finance, debt management issues are traditionally handled by the debt management office (DMO), often in coordination with the central bank. DMOs are responsible for debt issuance, debt servicing, treasury operations, settlement and related tasks. Rarely are they in charge of countries' level of disaster risk or commodity price volatility.
- 2. Complete debt management strategies.** A cornerstone of debt management is developing and implementing comprehensive, multiyear, consensual strategies. However, these strategies fail to clearly and explicitly include managing contingent liabilities such as disasters and/or commodity price volatility. Hence, incomplete strategies among EMDEs have often led to inaction and lack of expertise.
- 3. Satisfactory legal and regulatory frameworks.** Most DMOs have not been given explicit authority over fiscal insurance issues, creating a regulatory void and bureaucratic apathy. Nor have DMOs modernized the instruments they are allowed to use. Notable among them are ISDA-standard derivative agreements: template contracts that facilitate negotiation and execution of transactions. The lack of such agreements prevents public institutions from entering and executing derivative contracts or parametric insurance schemes. Section 4 analyzes these agreements in detail.
- 4. National procurement laws encouraging DMOs to buy hedging products in international markets.** Restrictive laws curtail the possibility of approaching multiple investors simultaneously and efficiently in search of innovative products, which may be untested or nonstandard, at the best possible prices.
- 5. Political will.** Without explicit rules of engagement, politicians are not inclined to authorize operations that may be misconstrued or misrepresented in the public arena, such as spending resources on an insurance policy that may not be triggered in the end.

Similarly, critical supply-side elements hamper the implementation of risk management for EMDEs. Private international financial institutions and investors

are often aware of and concerned about the limited capacity of EMDEs to enter the highly specialized field of modern risk management transactions and have no incentive to transfer knowledge or build capacity among their clients.

Credit considerations weigh heavily on the private supply of hedging instruments in EMDEs. Their relatively low credit rating has often made the pricing of insurance products prohibitively expensive, limiting the use of the very instruments that could raise credit ratings.

Beyond institutional capacity and credit quality, private international financial institutions may fear jeopardizing other, more lucrative business lines with the same clients, especially large international banks with significant local presence and operations. Reputational risks are always a hazard in providing a service for the first time to an inexperienced customer.

5.3. Instruments for Fiscal Risk Management: Old and New

For all its complexity, the architecture of development finance is based on four broad pillars (Figure 5.1):

1. **Reference rates** and/or benchmarks such as the interbank offered rate, Secured Overnight Financing Rate (SOFR) and others essential for pricing.
2. **Legal frameworks**, ranging from ISDA documentation to national governing laws, that underpin contracts and recourse.
3. **Banks, institutions and investors**, which channel funds from savers and taxpayers.
4. **Financial products** such as loans, bonds, derivatives (such as swaps) that provide the means to transfer capital and risk.

The section focuses on the three elements that matter most for fiscal insurance: **swaps, reference rates** and **ISDA agreements**.

5.3.1. Swaps

A swap is a contract in which one party exchanges or swaps one asset's values or cash flows for another. Of the two cash flows, one value is fixed and one variable based on an index value, interest rate or currency exchange rate.

Unlike standardized options and futures contracts, swaps are not exchange-traded instruments but customized contracts traded in the over-the-counter market between private parties. Firms and financial institutions dominate the swaps market, with few (if any) individuals ever participating. Because swaps occur in the over-the-counter market, a counterparty defaulting on a swap is always a risk.

Figure 5.1. International Architecture for Development Finance

IBOR = interbank offered rate, ISDA = International Swaps and Derivatives Association, SOFR = Secured Overnight Financing Rate, UK = United Kingdom.

The first interest rate swap occurred between IBM and the World Bank in 1981. However, despite their relative youth, swaps have exploded in popularity. By mid-2021, the aggregate notional amount of transacted swaps had reached USD600 trillion (Bank for International Settlements 2021).

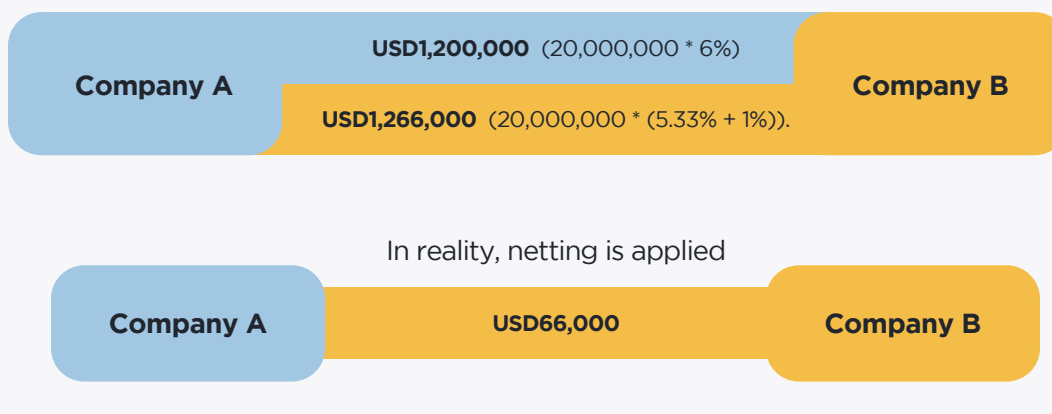
The most common and simplest swap is a plain vanilla interest rate swap. Counterparty A agrees to pay Counterparty B a predetermined, floating interest rate on a notional principal on specific dates for a specified period. Concurrently, Counterparty B agrees to make payments based on a fixed rate to Counterparty A on the same notional principal on the same specified dates for the same specified period.

In a plain vanilla interest rate swap, the two cash flows are paid in the same currency. The specified payment dates are called “settlement dates” and the times between “settlement periods.” Because swaps are customized contracts, interest payments may be made annually, quarterly, monthly or at any other interval determined by the parties. (See Box 5.1 for an example of a plain vanilla interest rate swap.)

The currency swap is a second form of swap that has become increasingly popular in fiscal risk management. It involves exchanging principal and/or fixed interest payments on a loan in one currency for the principal and/or fixed interest payments on a similar loan in another currency. Unlike an interest rate swap, the parties to a currency swap exchange principal amounts at the beginning and end of the swap. The two principal amounts are typically set as equal, given the exchange rate when the swap is initiated. (See Box 5.2 for an example of a plain vanilla currency swap.)

Box 5.1. Interest Rate Swap

- On Jan. 1, 2022, Company A and Company B enter into a five-year swap with the following terms:
 - Company A pays Company B an amount equal to 6% per annum on a notional principal of USD20 million.
 - Company B pays Company A an amount equal to the one-year London Interbank Offered Rate (LIBOR) + 1% per annum on a notional principal of USD20 million.
- LIBOR is the interest rate London banks offer on deposits made by other banks in the Eurodollar markets. The market for interest rate swaps frequently (but not always) used LIBOR as the base for the floating rate until 2020. The transition from LIBOR to other benchmarks, such as the SOFR, began in 2020.
- For simplicity, let's assume the two parties exchange payments annually on Jan. 1, beginning in 2023 and concluding in 2027.
- At the end of 2022, Company A will pay Company B USD1,200,000 ($USD20,000,000 * 6\%$).
- On Dec. 31, 2021, one-year LIBOR was 5.33%; Company B will pay Company A USD1,266,000 ($USD20,000,000 * [5.33\% + 1\%]$).
- Swap contracts normally allow payments to be netted against each other to avoid unnecessary payments. Company B pays USD66,000, and Company A pays nothing. At no point does the principal change hands, which is why it is referred to as a "notional" amount.



Another type of hedging transaction is the commodity swap, or a contract where two parties agree to exchange cash flows depending on the price of an underlying commodity. A commodity swap is usually used to hedge against price swings in the market for a commodity, such as oil. Commodity swaps allow producers and consumers of a commodity to lock in a set price. Commodity swaps are not traded on exchanges. Rather, they are customized transactions executed outside of formal exchanges and without the oversight of an exchange regulator. Most often, the deals are created by financial service companies.

Commodities can be hedged through the options market, with consumers usually utilizing call options (the right to buy at a specified price) and producers using put options (the right to sell at a specified price). A commodity swap consists of a floating-leg component and a fixed-leg component. The floating-leg component is tied to the market price of the underlying commodity or agreed-upon commodity

index, while the fixed-leg component is specified in the contract. Most commodity swaps are based on oil, although any commodity, such as precious metals, industrial metals, natural gas, livestock or grains, may underlie the swap.

Box 5.2. Currency Swap

Company C, a United States (US) firm, and Company D, a European firm, enter into a five-year currency swap for USD50 million. Let's assume an exchange rate of USD1.25 to EUR1 (USD1 to EUR0.80). The firms exchange principals.

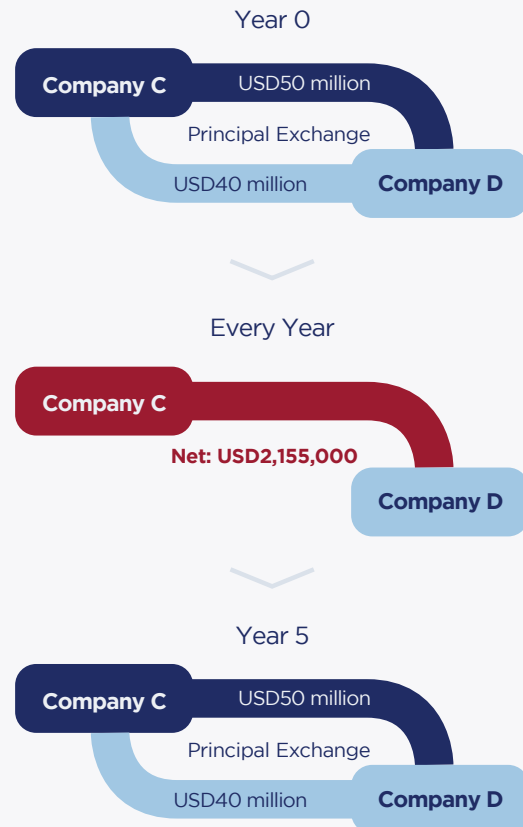
Company C pays USD50 million, and Company D pays EUR40 million, satisfying each company's need for funds denominated in another currency (the reason for the swap).

Let's say the agreed-upon US dollar-denominated interest rate is 8.25%, and the euro-denominated interest rate is 3.5%. Thus, each year, Company C pays EUR1,400,000 ($\text{EUR}40,000,000 * 3.5\%$) to Company D. Company D pays Company C USD4,125,000 ($\text{USD}50,000,000 * 8.25\%$).

As with interest rate swaps, the parties net the payments against each other at the then-prevailing exchange rate. If the exchange rate is USD1.40 per euro at the one-year mark, then Company C's payment equals roughly USD1,970,000 and Company D's USD4,125,000. In practice, Company D would pay Company C the net difference of USD2,155,000.

At intervals specified in the swap agreement, the parties exchange interest payments on their principal amounts. To keep things simple, let's say they make the payments annually, beginning one year from the exchange of principal. Because Company C has borrowed euros, it must pay interest in euros based on a euro interest rate. Likewise, Company D, which borrowed US dollars, pays interest in US dollars based on a US dollar interest rate.

Finally, the parties re-exchange the original principal amounts at the end of the swap (usually also the date of the final interest payment). The principal payments are unaffected by exchange rates at the time.



Because of the contracts' nature and sizes, only large financial institutions, not individual investors, typically engage in commodity swaps. Generally, the floating-leg component of the swap is held by the consumer of the commodity or the institution willing to pay a fixed price for it. The fixed-leg component is held by the producer of the commodity, who agrees to pay a floating rate, which is determined by the spot market price of the underlying commodity. The result is that the consumer of the commodity is guaranteed a price over a specified period, and the producer

is in a hedged position, protected from a decline in the commodity's price over the same period. Typically, commodity swaps are cash-settled, although physical delivery can be stipulated in the contract. (See Box 5.3 for an example of a plain vanilla commodity swap.)

Box 5.3. Commodity Swap

Company X must purchase 250,000 barrels of oil annually for the next two years. The forward prices for the delivery of oil are USD50 per barrel in one year and USD51 in two years. The one-year and two-year zero-coupon bond yields are 2% and 2.5%. Two scenarios can happen: Pay the entire cost upfront or pay each year upon delivery.

To calculate the upfront cost per barrel, divide the forward prices by their zero-coupon rates, adjusted for time. In this example, the cost per barrel would be as follows:

$$\text{Barrel cost} = \text{USD}50 / (1 + 2\%) + \text{USD}51 / (1 + 2.5\%)^2 = \text{USD}49.02 + \text{USD}48.54 = \text{USD}97.56.$$

By paying USD97.56 x 250,000 or USD24,390,536 today, the consumer is guaranteed 250,000 barrels of oil annually for two years. However, there is a counterparty risk, and the oil might not be delivered. If so, the consumer may opt to make two payments, one each year, as the barrels are being delivered. The following equation must be solved to equate the total cost to the above example:

$$\text{Barrel cost} = X / (1 + 2\%) + X / (1 + 2.5\%)^2 = \text{USD}97.56.$$

The consumer must pay USD50.49 per barrel each year.

Finally, swaps can be used for disaster risk management (DRM). A DRM swap is a customizable financial instrument traded over the counter that enables insurers to guard against massive potential losses in the wake of a significant natural disaster when numerous policyholders file claims within a short time frame. Such events place substantial financial pressure on insurance companies. A DRM swap is a mechanism for insurance companies to transfer some of the risks they have assumed rather than purchasing reinsurance or issuing a catastrophe bond (CAT bond).⁷⁴ In some DRM insurance swaps, insurers trade policies from different regions of a country or groups of countries to diversify their portfolios. For instance, a swap between an insurer in Florida or South Carolina and one in Washington or Oregon could mitigate insurance costs from damage from a single hurricane by spreading the risks among different regions. (See Box 5.4 for an example of a DRM swap.)

For a DRM swap, two parties—an insurer and an investor—exchange streams of periodic payments. The insurer's payments are based on a portfolio of the investor's securities, and the investor's payments are based on potential catastrophe losses as predicted by a catastrophe loss index.

⁷⁴ CAT bonds are high-yield debt instruments, usually insurance-linked, designed to raise funds in a catastrophe such as a hurricane or an earthquake. CAT bonds transfer a specified set of risks to investors.

Box 5.4. Disaster Risk Management Swap

- In 2014, the World Bank issued a three-year, USD30 million catastrophe bond as part of its capital-at-risk notes program, which allows its clients to hedge against natural disaster risk.
- The catastrophe bond, linked to the risk of damage by earthquakes and tropical cyclones in 16 Caribbean countries, was part of a catastrophe swap with the Caribbean Catastrophic Risk Insurance Facility (CCRIF).
- Simultaneous with issuing the USD30 million bond, the World Bank entered an agreement with the CCRIF, which echoed the bond's terms.
- The World Bank's balance sheets held the proceeds from the bond. If a natural disaster had occurred, the bond's principal would have been reduced by an agreed-upon amount laid out under the terms, and the proceeds would then have been paid to the CCRIF.

5.3.2. London Interbank Offered Rate and its successors

LIBOR is an interest rate benchmark administered by Intercontinental Exchange (ICE) Benchmark Administration, Inc. and began being referenced in the early 1990s. It is the most used benchmark reference rate or interbank-offered rate in global financial markets, underpinning more than USD400 trillion in transactions globally. It is derived from a daily survey of large banks (LIBOR panel banks), which estimates how much it would cost them to borrow from each other on an unsecured basis (i.e., without putting up collateral) for set periods and in particular currencies. LIBOR is often referenced in loan, derivative and bond documentation, as well as in other types of documentation (e.g., securitization products, mortgages, options and so on), to calculate interest payments under the products. However, the LIBOR platform is being phased out and replaced by alternative reference rates (ARRs).

Why? The integrity of LIBOR was called into question in 2008 when several banks contributing to its calculation were accused (and some found guilty!) of colluding to manipulate the rate. In 2014, the Financial Stability Board published a report explaining that benchmarks such as LIBOR should be based on actual transactions to the greatest extent possible. Certain changes were made to how LIBOR is calculated to base it more on actual transactions. However, since fewer banks are lending to each other on an unsecured basis, LIBOR is often calculated by reference to the “expert judgment” of panel banks (i.e., estimates of how much they think it would cost them to borrow from other banks).

In July 2017, the United Kingdom (UK) Financial Conduct Authority (FCA), the LIBOR regulator, announced that, despite efforts to base LIBOR more firmly on actual transactions, the underlying market that LIBOR seeks to measure (i.e., unsecured interbank lending) is no longer sufficiently active. As a result, while the panel banks had agreed to continue submitting to LIBOR until the end of 2021, the FCA would not compel banks to submit to LIBOR after that. The FCA's announcement initiated LIBOR's phased discontinuation. Since 2017, regulators have urged global market participants to plan for the cessation of LIBOR by the end of 2021 and encouraged them to transition from LIBOR to alternative “risk-free” rates.

To that end, on March 5, 2021, the FCA announced a staggered timetable for future cessation and loss of representativeness of LIBOR benchmarks, with deadlines of

Dec. 31, 2021, for most LIBOR settings and June 30, 2023, for the remaining US dollar LIBOR benchmarks, including three- and six-month US dollar LIBOR settings, to give legacy contracts sufficient time to wind down.

Despite the extension of publication for certain US dollar LIBORs to June 30, 2023, US and UK regulators' guidance remains: LIBOR should not be used for new contracts after 2021, except in limited circumstances. ARRs to LIBOR have been identified for all LIBOR settings in the US dollar, euro, British pound, Swiss franc and Japanese yen.

LIBOR is being phased out across all its underlying currencies. Table 5.1 lists the ARRs that will replace LIBOR as determined by regulators and financial market administrative bodies.

Table 5.1. Alternative Reference Rates

Jurisdiction	Alternative Reference Rate	Working Group	Rate Administrator	Rate Type	Tenor
United States	Secured Overnight Financing Rate (SOFR)	Alternative Reference Rates Committee (ARRC)	New York Fed	Secured*	Overnight
Great Britain	Sterling Overnight Index Average (SONIA)	Working Group on Sterling Risk-Free Reference Rates	Bank of England	Unsecured	Overnight
European Union	Euro Short-Term Rate (€STR)	Working Group on Risk-Free Reference Rates for the Euro Area	European Central Bank	Unsecured	Overnight
Switzerland	Swiss Average Rate Overnight (SARON)	National Working Group on Swiss Franc Reference Rate	SIX Swiss Exchange	Secured*	Overnight
Japan	Tokyo Overnight Average Rate (TONA)	Study Group on Risk-Free Reference Rate	Bank of Japan	Unsecured	Overnight

*Collateralized; takes the credit component out of the rate.
Source: Treasury, World Bank.

One notable exception is the euro interbank offered rate (EURIBOR), which has undergone reforms and is expected to remain a financing benchmark. However, whether EURIBOR is to be slowly supplanted by the euro short-term rate or another risk-free rate remains unknown.

For US dollar markets, in 2017, the Alternative Reference Rates Committee (ARRC) selected the SOFR to represent best practices in US dollar derivative and financial markets. SOFR is based on observable repo rates: the cost of borrowing cash overnight collateralized by US Treasury securities.

The ARRC, composed of private market participants convened by the Federal

Reserve Board and the New York Fed, has led the efforts to determine the alternative benchmark rate. The key differences between ARR and LIBOR relate to the term structure, methodology and credit risk.

First, LIBOR's term structure is forward-looking and well-defined. LIBOR offers overnight, one-week and one-, two-, three-, six- and 12-month terms. ARR, however, are backward-looking and have an overnight term structure. Second, LIBOR is set in advance for various tenors (i.e., forward-looking term rates) and determined by the panel banks. By contrast, ARR are based on observable market transactions and compounded in arrears (i.e., backward-looking daily rates). Finally, LIBOR is unsecured, while the Swiss franc and US dollar alternative rates are secured and require calculating and applying a credit adjustment.

5.3.3. International Swaps and Derivatives Association master agreement

An ISDA master agreement is the standard document that governs over-the-counter derivative transactions. The agreement, published by ISDA, outlines the terms for a derivative transaction between two parties, typically a derivative dealer and a counterparty. The ISDA master agreement is standard but accompanied by a customized schedule and sometimes a credit support annex, both of which are signed by the parties to the transaction.

The two main benefits of an ISDA master agreement are transparency and liquidity. Since the agreement is standardized, all parties can study how it works. Using it improves transparency by reducing the possibility of obscure provisions and escape clauses entering an agreement. Standardization increases liquidity since the agreement makes it easier for the parties to engage in repeated transactions. The clarified terms offered by such an agreement save time and legal fees.

The foreign exchange and interest rate swap markets have grown impressively over the last several decades. Together, they now account for trillions of dollars in daily trades. The original ISDA master agreement was created to standardize trades in 1985. It was updated and revised in 1992 and 2002; both versions may be used. Banks and other corporations around the world use ISDA master agreements. They make transaction closeout and netting easier by bridging the gap between various standards used in different jurisdictions.

Most multinational banks have ISDA master agreements in place with each other, usually covering all branches active in foreign exchange, interest rate or options trading. Banks require corporate counterparties to sign an ISDA agreement to enter into swaps. Some demand agreements for foreign exchange transactions.

The ISDA framework is structured around five main components:

1. A **master agreement** is a standardized, generally accepted document that does not allow amendments to its form and must be signed "as is."
2. A **schedule**, negotiated only once at the outset of the contract, governs (together with the master agreement) all swap transactions between the parties. Unlike

the master agreement, however, the schedule allows for choices, amendments and additions.

3. **Confirmations** document the economic terms of each transaction entered into under the agreement, allowing for one-time modifications to certain master agreement provisions and supplements. Confirmations form part of and are subject to the ISDA master agreement between the parties and rely on ISDA definitions.
4. **Additional agreements and documents**—such as definitions composed of booklets of standard definitions and other terms and provisions published by ISDA—record the different types of derivative transactions. Each set of definitions provides terms for documenting a particular type of derivative transaction, such as equity swaps, currency options, commodity swaps, credit derivatives, currency derivatives, etc. Credit support annexes (CSAs) are collateral requirements designed to reduce credit risk continuously. Although CSAs are not mandatory, they are prevalent, particularly among banks. Different models exist according to specific governing laws and subjects (e.g., pledge, transfer of title and so on).
5. **Legal opinions** address specific subjects and provisions, such as enforceability of contracts, collateral arrangements, payments, closeouts, etc.

The ISDA framework is an essential component that regulates and documents international financial transactions routinely used by developed economies. EMDEs should seriously consider adhering to this international standard framework to more efficiently embark on risk management issues in general and fiscal risk insurance in particular.

5.4. Applied Fiscal Risk Management: Country Case Studies and Infrastructure Financing

The section reviews several examples of EMDEs that tackle fiscal risk by entering into swap-based hedging transactions. The main result has been reduced vulnerability to exogenous shocks and greater debt sustainability.

While risk management tools apply to many kinds of countries, projects and loans, they are particularly suitable for infrastructure projects, which are especially exposed to multiple risks such as interest, currency, commodity and/or natural disaster risks.

We created a hypothetical case study (Box 5.5) of an infrastructure project, which we use as a common thread as we examine various country examples (boxed and in red) to highlight its applicability to infrastructure projects in general.

Box 5.5. Hypothetical Infrastructure Project

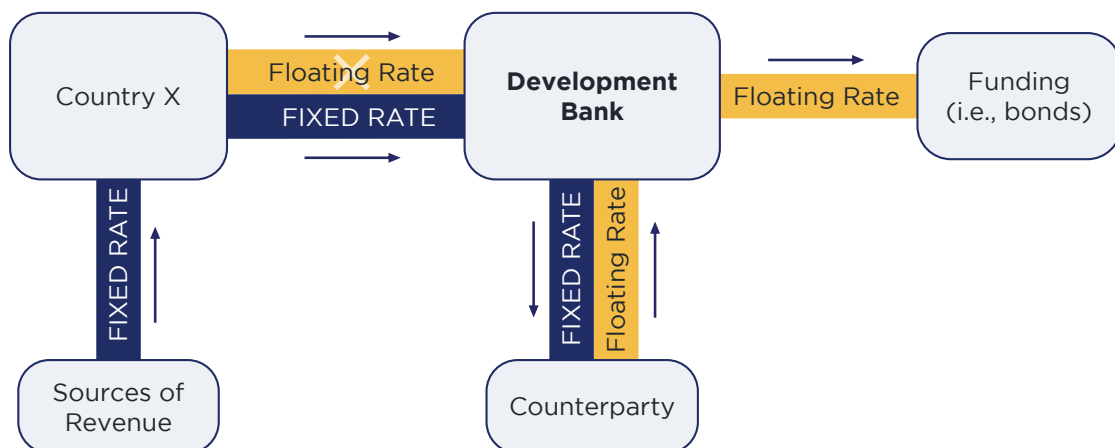
- USD500 million loan to Country ABC.
- Loan is at a variable SOFR rate + 200 basis points.
- 10-year loan.
- Funding for a combined-cycle hydroelectric plant, which can use water or oil and/or natural gas alternatively to run the turbines to produce electricity.
- Three-year construction phase.
- Plant will be operational after year three.
- After year three, the plant will start generating revenues in local currency.
- Country ABC is particularly prone to natural disasters, such as prolonged periods of insufficient rainfall and drought.
- Contract for plant construction has been awarded to a Japanese consortium and will use Japanese-made machinery and equipment.

5.4.1. Interest rate swaps

Clients are exposed to interest rate risk when they borrow, for instance, on a floating-rate basis but have revenues uncorrelated to the floating-rate benchmark, producing a mismatch between the interest rate basis of what Country X owes and what it earns.

An interest rate swap is a derivative transaction that swaps cash flows from fixed to floating rates or vice versa (Figure 5.2):

Figure 5.2. Interest Rate Swap



Source: Author.

CASE STUDY: PANAMA INTEREST RATE SWAP

Panama was concerned about exposure to interest rate risk on a USD100 million loan from the International Bank for Reconstruction and Development (IBRD), with a variable spread over LIBOR. Panama's debt management strategy focuses on reducing exposure to interest rate risk, and market projections forecast a likely increase in interest rates. On behalf of Panama, IBRD intermediated an interest rate swap with the market to fix a reference rate at 3.27% for 20 years. After the swap, Panama significantly reduced its exposure to interest rate volatility, thus buttressing its development goals and long-term sustainability.

Applicability to Infrastructure Projects (see Box 5.5)

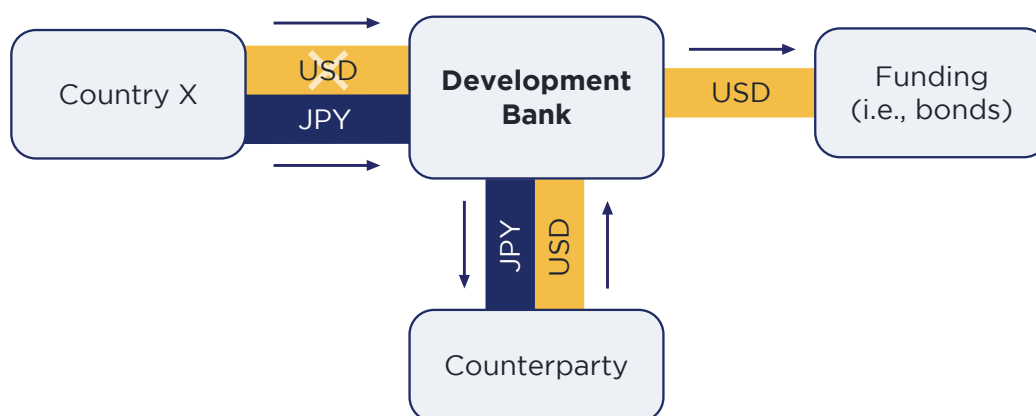
A hypothetical infrastructure project would benefit from swapping the loan (initially at a variable SOFR rate + 200 basis points) into an equivalent fixed-rate loan at a minimum during the 3-year construction phase, where certainty of debt-servicing expenses is important and interest rate volatility could be more damaging.

5.4.2. Currency swaps

A country (Country X) borrows in foreign currency (US dollars) but might prefer, for example, to swap it for yen because its economy is highly geared to Japan's and/or it exports to Japan and receives yen.

A currency swap is a derivative transaction that exchanges cash flows from one currency to another (Figure 5.3):

Figure 5.3. Currency Swap



Source: Author.

CASE STUDY: MOROCCO CROSS-CURRENCY SWAP

Morocco's main trade partner is Europe. In 2012, the country wanted to raise financing in the international bond markets, but investor appetite for euro-denominated bonds

was low. However, Morocco was able to issue in US dollars due to greater investor appetite and more competitive pricing at the time.

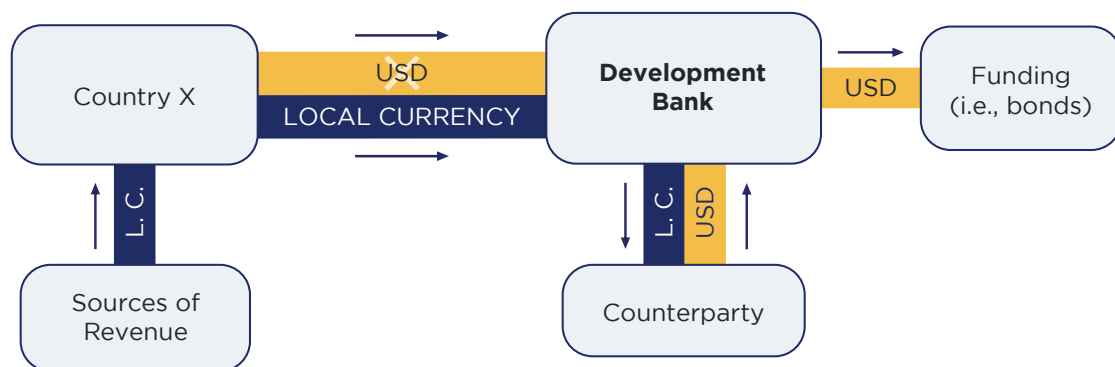
Morocco, however, needed to reduce US dollar exposure and match the currency of its assets with that of its liabilities. IBRD executed a currency swap to exchange US dollar-denominated coupon payments and principal repayment of USD1 billion in bonds for euros. Through the swap, Morocco maintained the targeted composition of its debt portfolio and secured access to a currency hedge with minimal exposure to counterparty risk.

Applicability to Infrastructure Projects (see Box 5.5)

A hypothetical infrastructure project would benefit from swapping the loan (initially denominated in US dollars) for yen to match the currency of its expenditures for the Japanese consortium building the plant and the expenses for the Japanese machinery.

A currency swap can be structured to exchange cash flows for local currency (Figure 5.4):

Figure 5.4. Currency Swap



Source: Author.

Development banks offer or can offer local currency financing through **swaps** (the most prevalent alternative and subject to the availability of sufficient counterparties active in local markets and/or currencies) and/or **bond markets** (issuance in local currencies for on-lending operations or back-to-back financing).

Development banks' ability to execute long maturities and large sizes depends on the liquidity available in the markets. Governments can usually issue in local currencies in domestic markets with better terms than development banks, which makes conversions into local currency less attractive for sovereigns. However, sub-sovereigns and specific projects can greatly benefit from local currency financing at attractive pricing levels. The number of local currencies available for local currency financing is highly dependent on market conditions and developments.

CASE STUDY: MEXICO LOCAL CURRENCY FINANCING

In the late 1990s, Mexican states had difficulty obtaining local currency financing due to market conditions and limiting local regulations. Financial intermediaries, such as Banobras (a local development bank), used a government trust fund to manage risk, concentrating currency risk exposure in the federal government. The fee charged for foreign exchange made foreign currency loans too expensive for the states.

Through a currency swap transaction, IBRD, on behalf of the states, converted each loan disbursement into local currency, transforming the loan obligation from US dollars to Mexican pesos. Thus, the states gained access to peso financing at attractive price levels, consequently reducing their overall exposure to exchange rate volatility.

Applicability to Infrastructure Projects (see Box 5.5)

A hypothetical infrastructure project should consider the possibility (should market conditions allow it) of swapping the loan after year three (and until maturity) for local currency when the plant starts generating local currency revenues. The objective would be to match, as much as possible, the sources of revenue with debt-servicing expenditures.

5.4.3. Commodity swaps and/or transactions

Countries are exposed to commodity price risk directly or indirectly through tax or royalty income from commodity exports and/or contingent liabilities related to subsidy programs, price stabilization schemes and/or safety nets and support mechanisms. The countries can hedge their exposure to commodity price volatility via commodity swaps, call options (e.g., protection against the risk of price increases for importers) and/or put options (e.g., protection against the risk of price decreases for producers).

CASE STUDY: URUGUAY OIL HEDGING

Uruguay imports about 12 million-14 million barrels of oil per year. An unexpected increase in oil prices can force the government to divert budgetary resources from other priorities. The finance ministry wanted to insulate the budget from abrupt and significant increases in oil prices and instructed the World Bank's Treasury and Uruguay's DMO to work together to design an oil-hedging program as part of a comprehensive risk management strategy.

The culmination was the government executing a commodity hedge through the World Bank. It purchased 12 month Asian call options on six million barrels to purchase oil at an average price of USD55/barrel.

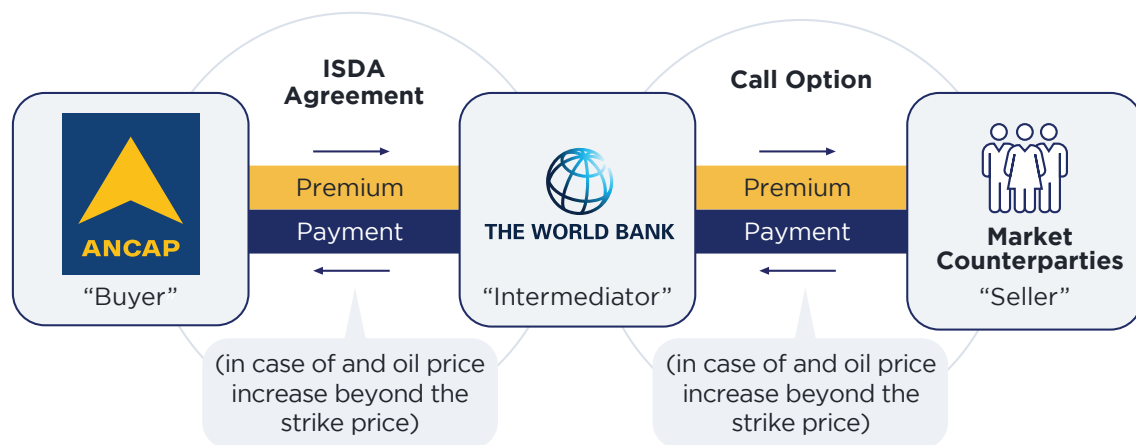
CASE STUDY: URUGUAY SUB-SOVEREIGN OIL HEDGING

Although Uruguay has dramatically reduced its carbon footprint with an ambitious renewable energy program, ANCAP (the sub-sovereign entity that operates Uruguay's single refinery) is a net commodity importer and vulnerable to price

increases. Any significant deficit in ANCAP's balance sheet leaves the government open to fiscal risk due to the implicit contingent liability. Uruguay's risk management objectives were to reduce fiscal exposure to commodity price shocks and insulate the budget from abrupt and significant commodity price increases, thus underpinning macro-financial resiliency.

Under the ISDA agreement signed with the World Bank, ANCAP used call options to protect its budget by having the right to buy a specific quantity of oil at a preset (strike) price on a determined date. Should commodity prices increase beyond the threshold, ANCAP would receive a payment compensating for the difference between the strike and market prices. The World Bank, as the intermediary, executed derivative agreements with market counterparties (Figure 5.5), mirroring the agreement conditions between ANCAP and itself, protecting its own balance sheet.

Figure 5.5. ANCAP Commodity Hedging



ISDA = International Swaps and Derivatives Association.

Source: World Bank (2019a).

CASE STUDY: TUNISIA AND MOROCCO

Tunisia. The case of Tunisia—a net oil importer—relates to fiscal insurance against oil price volatility. Like Uruguay, Tunisia is vulnerable to increases in oil product prices, which can impact fiscal and current accounts and diminish the ability of the government to deliver on its social programs and domestic investments. The government has faced significant challenges in the energy sector over the last decade, with demand for energy products growing steadily by five to 11% per year, and crude oil and natural gas production decreasing by 15% and 5%, respectively, over the same period. As a result, energy import dependency reached 49% of consumption in 2017, while energy subsidies accounted for 2% and 2.8% of gross domestic product (GDP) in 2017 and 2018, putting further pressure on the current account and fiscal deficits.

Assisted by the International Monetary Fund and the World Bank, the country created an inter-ministerial task force on energy subsidy reforms to address the

vulnerability in mid-2018. It developed a technical assistance road map to shift to market-based hedging of energy prices.

The road map's concrete objectives and principles included the sustainable and progressive reduction in the cost of the country's subsidy program. The government, therefore, launched an oil insurance program to protect the budget against the risk of large increases in oil prices and their direct impact on fiscal accounts.

In December 2018, the World Bank intermediated, on behalf of the government, the purchase of oil call options from market counterparties for an aggregate notional amount of USD520 million on an underlying eight million barrels with a tenor of 12 months. The operation brought several benefits, such as (1) protection of the budget and fiscal accounts from oil price shocks for the duration of the coverage, (2) reduced pressure on capital accounts due to lower foreign reserves volatility and (3) fostering of a risk management culture and development of a necessary skill set. The transaction was an essential component of government efforts to cushion the budgetary impact of growing energy demand and to shift the energy mix to renewable resources.

Morocco. The fiscal standing of Morocco is exposed to oil price volatility arising from its butane gas subsidy program.

In 2009, the government began eliminating subsidies on oil products, including diesel, gasoline and heating oil. Butane gas, however, is used by lower-income and remote households for cooking and heating, with few environmentally safe and cost-effective alternatives. The government continued subsidizing small bottles of butane gas as a social protection program for lower-income people.

The program exposes the government to swings in the price of butane; when market prices rise, the government's cost of maintaining the program also rises, potentially reducing the government's budget for other social and development projects. In 2018, the butane subsidy program cost 1.5% of GDP but flared up to 6.6% in 2012.

To partially reduce the exposure, in June 2019, the Ministry of Finance executed the purchase of a series of call options covering an aggregate total volume of 840,000 metric tons of butane or about 80% of Morocco's exposure until December 2019.

The government's hedging program immediately improved the sovereign credit rating and helped the government solidify its BBB- rating. After the execution of the first round of hedges, Standard and Poor improved Morocco's international credit rating outlook from negative to stable, partially attributing the change to the kingdom's effective control of one of the largest ongoing sources of fiscal instability.

Applicability to Infrastructure Projects (see Box 5.5)

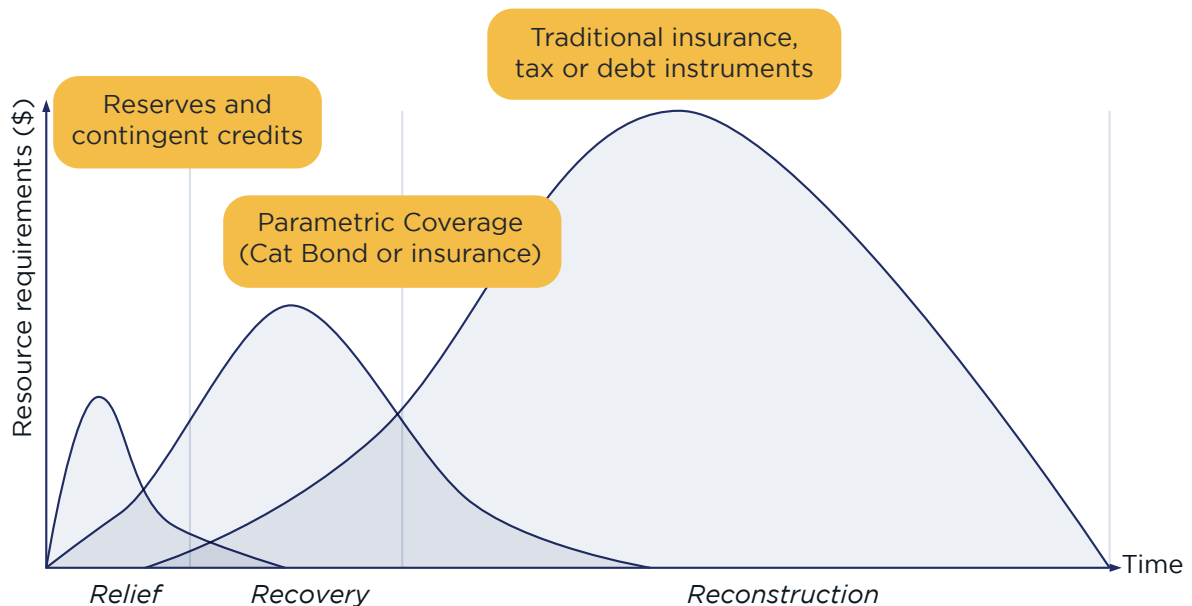
A hypothetical infrastructure project (and/or Country ABC) would benefit from entering into oil-hedging transactions after year three when the plant is expected to become operational. Since oil and/or natural gas could be an important input in electricity production, reducing vulnerability to the highly volatile oil sector could be essential to ensure medium- and long-term sustainability.

5.4.4. Disaster risk management swaps and/or transactions

Countries exposed to natural disasters face challenges such as responding to immediate financing needs after an event and strengthening response capacity while protecting long-term fiscal balance. Low- and middle-income countries bear weather risks that can greatly impact their GDP and budget via direct economic loss (e.g., damage to housing stock) and production shocks (e.g., damage to agricultural production).

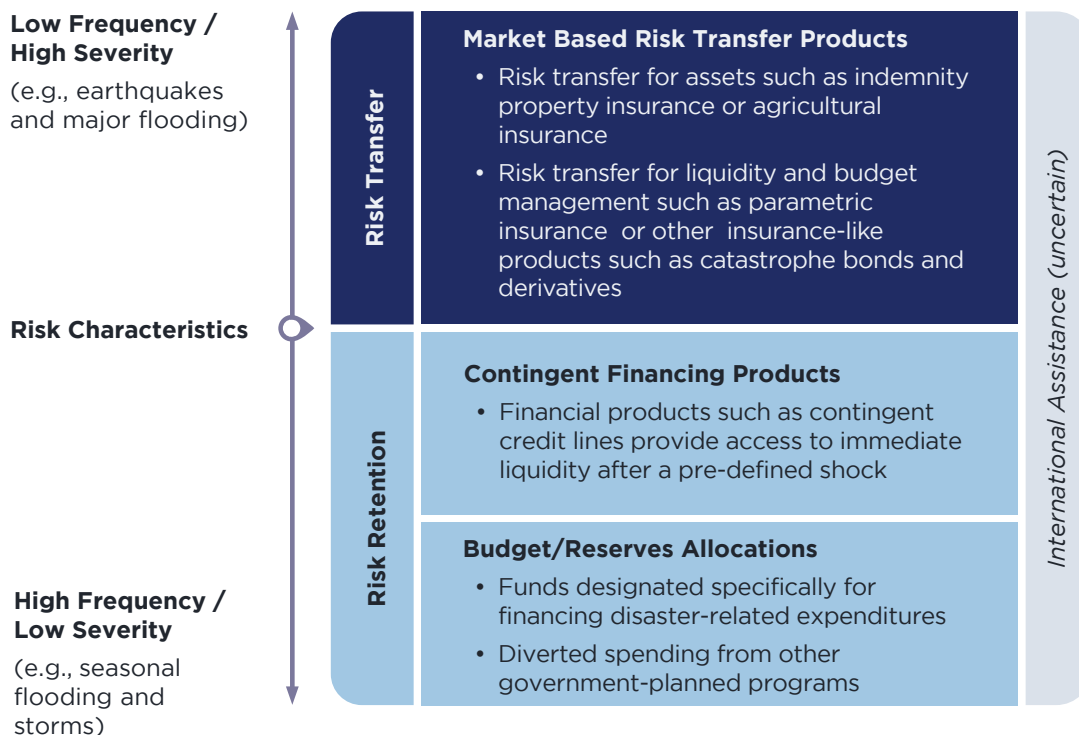
Hedging products can help insure against disaster risks in a risk management framework. The aftermath of a natural disaster has distinct phases—relief, recovery, reconstruction (Figure 5.6)—that dictate widely different potential financing responses over time.

Figure 5.6. Natural Disaster Financing Phases



Source: World Bank.

The responses need to be calibrated according to severity and frequency of the natural disaster. A range of financial products (Figure 5.7) can be used to mitigate the financial risks of natural disasters. The optimum mix of approaches depends on the types of risks a country faces and the frequency and severity of different disaster events.

Figure 5.7. Natural Disaster Financing Options

Source: World Bank (2019b).

CASE STUDY: PHILIPPINES

The Philippines is one of the most disaster-prone countries in the world, with high exposure to tropical cyclones, earthquakes and other natural hazards. For instance, Typhoon Yolanda (Haiyan) resulted in 6,300 lives lost and an estimated USD12.9 billion in damages, equivalent to about 4.7% of GDP in 2013.

The government prioritizes strengthening the country's resilience to natural disasters by protecting against losses from earthquakes and tropical cyclones, including excess rainfall (without increasing sovereign debt), gaining access to fast-disbursing and cost-effective insurance and reducing cost uncertainty over time.

The government addressed vulnerability to natural disasters through contingent loans (e.g., catastrophe deferred drawdown option [CAT DDO]) and a nationwide DRM insurance mechanism.

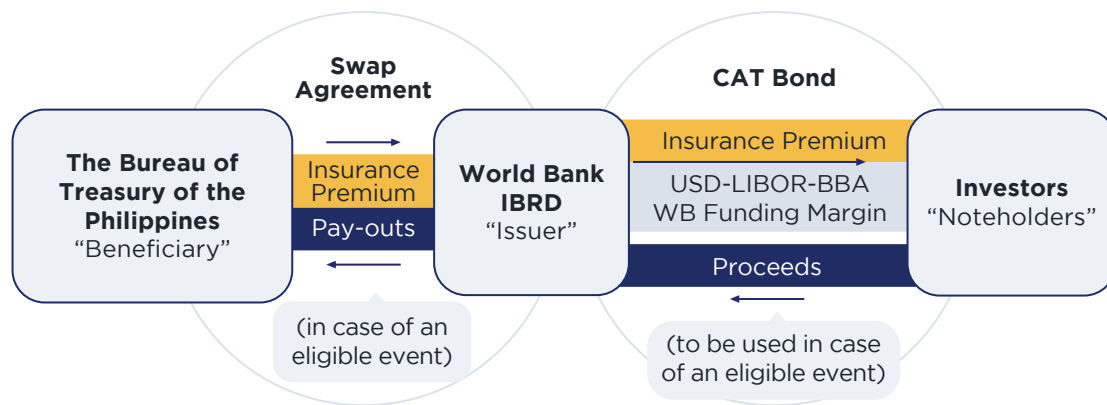
A CAT DDO is a specialized World Bank loan that provides liquidity to countries following a natural disaster, secures access to up to USD500 million or 0.25% of GDP (whichever is less) before an event occurs and makes funds available for disbursement immediately after the declaration of a state of emergency due to a natural disaster.

In 2012, the Philippines signed its first USD500 million CAT DDO. After tropical storm Sendong hit the country, the government withdrew the entire amount for recovery and reconstruction activities.

In November 2019, the World Bank issued to capital market investors two tranches of CAT bonds, providing nationwide insurance coverage of up to USD225 million (USD75 million for earthquakes and USD150 million for tropical cyclones) for three years.

When a qualifying event occurs (Figure 5.8), the Philippines will notify an independent calculation agent to determine the insurance payouts. The World Bank will transfer the payouts to the Philippines without assessing real losses incurred. The Philippines pays an insurance premium for the coverage, which the World Bank transfers to the CAT bond investors. The premium is fixed during the bond's life, removing cost uncertainty.

Figure 5.8. Philippines Catastrophe Insurance



*BBA = British Banker' Association, CAT = catastrophe, IBRD = International Bank for Reconstruction and Development, LIBOR = London Interbank Offered Rate, WB = World Bank.
Source: World Bank (2019b).*

CASE STUDY: PACIFIC ISLANDS

Small economies such as the Marshall Islands, Tonga, Solomon Islands, Samoa or Vanuatu are typically highly exposed to natural disasters, and catastrophic events have traditionally had big fiscal impacts.

The Pacific Catastrophe Risk Insurance Pilot (2012) pooled-risk approach provided coverage for up to USD45 million to reduce such exposure. Through the pilot (Figure 5.9), rapid payouts are linked to the impact of an earthquake, tropical cyclone or tsunami and country-specific catastrophe risk policies taken to the market as a single, well-diversified portfolio. The International Development Association is the intermediary between countries and reinsurance companies, and Japan finances the premium.

Figure 5.9. Pacific Catastrophe Risk Insurance Pilot

How does the Pacific Catastrophe Risk Insurance Pilot work?

1. Each government signs a derivative contract with the World Bank based on the ISDA framework.
2. Premiums are paid periodically to the World Bank.
3. The World Bank enters into a mirroring agreement with market counterparties, paying periodic premiums.
4. In case of a natural disaster, the claim can be initiated in two ways: a) the affected government sends a notification to the World Bank; b) the Bank by itself notifies/sends a request to the calculation agent to produce a calculation report.
5. The calculation agent delivers a calculation report to all actors, specifying whether the event has triggered a payout and the amount of the payout, which is based on the severity of the event.
6. The market counterparties deliver the payout to the World Bank based on the calculation report.
7. The World Bank delivers the payout to the affected government.

ISDA = International Swaps and Derivatives Association.

Source: World Bank (2014).

CASE STUDY: URUGUAY'S WEATHER DERIVATIVES

Hydropower generates more than 80% of Uruguay's energy needs. The country is highly exposed to drought, and the state-owned power company, UTE, suffers financial losses when rain is insufficient to feed the hydropower plants. Alternative thermal power generation costs more and requires fuel imports. The 2008 drought and record-high oil prices cost the government more than USD400 million. In 2012, UTE had to borrow from the market and withdrew USD150 million from Uruguay's Energy Stabilization Fund, ultimately increasing consumer utility rates.

To reduce its exposure and that of the government, UTE entered into a customized 18-month weather derivative contract that provided coverage against the combined risk of drought and high oil prices up to a maximum payout of USD450 million (Figure 5.10). IBRD acted as an intermediary, the counterparty to UTE and reinsurance companies.

Applicability to Infrastructure Projects (see Box 5.5)

A hypothetical infrastructure project (and/or Country ABC) would benefit (as the case of Uruguay highlights) from entering into weather derivative and oil-hedging transactions. Since rainfall and/or oil and natural gas could be an important input in electricity production, reducing vulnerability to droughts and/or oil could be essential to ensure medium- and long-term sustainability.

Figure 5.10. Uruguay's Weather and Oil Insurance



Source: World Bank (2013).

CASE STUDY: PACIFIC ALLIANCE JOINT CATASTROPHE BOND

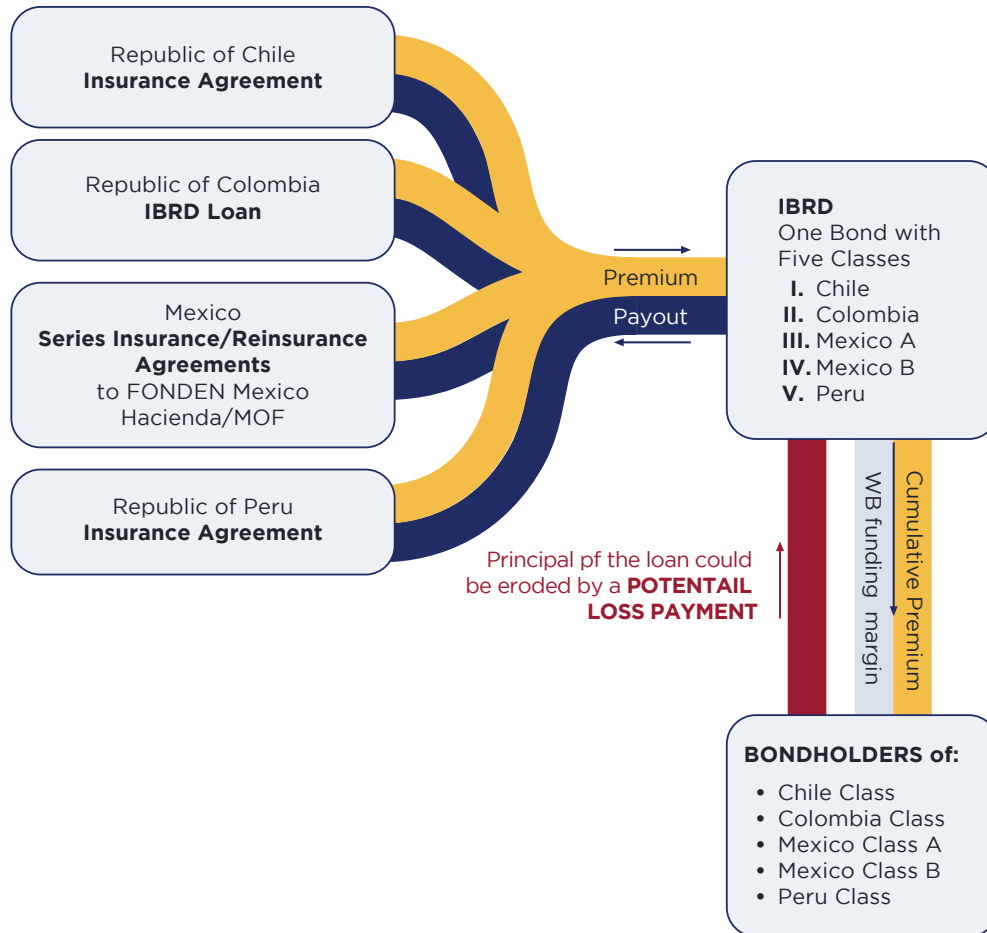
The countries of the Pacific Alliance (Colombia, Chile, Mexico and Peru), being highly exposed to natural disasters, worked together guided by three main principles and objectives:

1. To increase resilience by expanding financing options for significant natural disaster risks beyond the scope of budget funds and without increasing sovereign debt.
2. To gain access to fast-disbursing and cost-effective financing capacity in capital markets.

3. To demonstrate the effectiveness of the Pacific Alliance by implementing an innovative solution that benefits all countries.

To meet the needs of the Pacific Alliance, the World Bank issued a CAT bond for USD1.36 billion, providing earthquake coverage to Chile, Colombia, Mexico and Peru (Figure 5.11).

Figure 5.11. Pacific Alliance Catastrophe Bond



*IBRD = International Bank for Reconstruction and Development, MoF = Ministry of Finance, WB = World Bank.
Source: World Bank (2018).*

5.5. Conclusion

The potential benefits of better fiscal risk management in EMDEs are large. Hedging against geological, climate, commodity or financial risks could bring about more sustainable and much cheaper borrowing. Conversely, private international financial institutions and investors have developed a full menu of products and services over the last few decades designed to mitigate fiscal risks. But the institutions and investors

have deployed the products and services almost exclusively in the developed world. A significant market gap exists between pent-up demand and potential supply.

Enter development banks! They are uniquely positioned to correct market failures such as the under-deployment of fiscal insurance. Their convening power enables them to bring all parties to the table and connect supply and demand in a manner all perceive to be safe and fair.

The not-for-profit status of development banks ensures that all participants see them as honest brokers whose sole motivation is to help their constituent countries achieve their development goals. The perception is critical to overcoming the reservations that public officials may have about engaging with for-profit institutions and private investors.

Development banks have, over many decades, nurtured top-class expertise in managing the risks in their own balance sheets. In some cases, the development banks pioneered instruments that the market then adopted (e.g., green bonds by the World Bank). Along the way, they built large networks of connections in international banking, insurance and re-insurance and in the investor community they serve. Their know-how and “Rolodex” are enormously valuable assets they can tap at zero cost.

Finally, while private international financiers are naturally reluctant to fund capacity building among their EMDE clients, doing so is part of development banks’ mandate. Knowledge sharing (North-South and South-South) and institutional development are global public goods development banks are happy to fund themselves or through official donors.

Fiscal risk management products must be used more broadly and deeply by EMDEs. Development banks themselves have an interest in seeing that happen. They have witnessed over the decades how economic development and poverty alleviation can be wiped out—literally and figuratively—by a tropical cyclone, an earthquake or a commodity price shock. They know their clients must shift their risk management approaches to emphasize **being prepared** rather than simply **reacting**. But development banks also foster better risk management in EMDEs for a subtler reason: protecting their own creditworthiness and improving the quality of their own loan portfolios.

Would involvement in risk management by development banks fundamentally change their business model? Not quite. They already share their financial strength and their expertise with their clients. They use their superior creditworthiness (based on the backing of their member countries) to borrow at low interest rates, which they then pass on to their own borrowers and are happy to share their knowledge openly and for free. The same practices can be applied to risk management instruments, with one extra benefit: while lending requires capital to cover exposure to the borrower, fiscal insurance does not. Development banks can arrange for swaps, CAT bonds or parametric insurance for a client and match them with “mirror” transactions with private investors, keeping the development banks’ own net exposure at zero. Development banks can be brokers of risk management services between sovereigns and markets.

The potential dimension and impact of development banks brokering fiscal risk insurance begs another question: Should a dedicated institution exist for such insurance within the multilateral financial architecture? Two such institutions already exist to protect **investors**: the Multilateral Investment Guarantee Agency and the International Center for the Settlement of Investment Disputes. There is no reason why a similar institution could not be set up to protect **governments**.

A multilateral fiscal insurance agency could be a game-changer for sovereigns. It would help their immediate creditworthiness and strengthen the sustainability of their debts, especially for commodity-dependent countries. But the agency would also give them a trusted source of expertise and best practices for decisions that are technically complex, multisectoral and difficult to implement, such as agreeing on the right probability and fair price for earthquake coverage. How different would government responses have been to the coronavirus disease (COVID-19) pandemic and the war-triggered spike in energy and food prices had they had adequate insurance?

A multilateral fiscal insurance agency could simultaneously achieve several objectives that currently go unserved, including the following:

1. Become the “go to” entity for fiscal insurance issues and products, efficiently connecting EMDE governments with private international financial institutions and investors.
2. Offer risk management intermediation services between the public and private sectors, with negligible capital requirements, simply by structuring products matched by mirror transactions with the private sector.
3. Provide a one-stop entity for the preparation, execution and settlement of risk insurance transactions, anchored on the not-for-profit principle and funded in either a subsidized manner or on a strictly cost-recovery basis.
4. Articulate a transparent and standardized legal framework for the execution and documentation of risk management products for all its signatory members (a multilateral ISDA master agreement?).
5. Establish a forum for capacity building and knowledge transfer, nurtured by international experience from advanced countries and EMDEs.
6. Distill and disseminate experiences, best practices and benchmarks as a public good to benefit governments, investors, insurance and re-insurance operators, financial supervisors and regulators.

Development banks’ involvement in fiscal risk management has been, at best, timid and sporadic. While it is universally believed that EMDEs must be urgently assisted in resolving fiscal vulnerabilities related to disaster and commodity risks, assistance has been less than systematic and far smaller than necessary. Some development banks have formally endorsed the strategic significance of fiscal risk management as a sustainable development imperative. Yet, they have fallen short of the mark by creating **ad hoc** platforms and **one-off** pilot programs that have not gained scale and seem unlikely to do so.

A new, fully dedicated multilateral agency could do better.

References

Bank for International Settlements. 2021. OTC Derivatives Statistics.

World Bank. 2013. Mitigating the Impact of Drought on Energy Production in Uruguay. Treasury Case Study. Washington, DC.

World Bank. 2014. Helping Small Island States Cope in the Aftermath of Natural Disasters. Treasury Case Study. Washington, DC.

World Bank. 2018. Super-Sized Catastrophe Bond for Earthquake Risk in Latin America. Treasury Case Study. Washington, DC.

World Bank. 2019a. Protecting State-Owned Enterprises (SOEs) Against Commodity Price Volatility. Treasury Case Study. Washington, DC.

World Bank. 2019b. The Philippines: Transferring the Cost of Severe Natural Disasters to Capital Markets. Treasury Case Study. Washington, DC.

Chapter 6

Contingent Liabilities and “Hidden Debt”

Murray Petrie

Abstract

This chapter explores payment obligations a government may be responsible for if a specific event occurs. These contingent liabilities can be found—or “hidden”—in many areas of public policy, from government guarantees and public-private partnerships for infrastructure projects to state-owned enterprises, subnational governments, disaster relief and the finance sector. At times, the value of contingent liabilities can be a large share of the reported public debt, and their very existence can depress the credit rating of sovereign bonds (even more so when their reporting is uncertain). More transparent management of and communication around contingent liabilities can ease financing conditions for borrowers while supporting sounder action for lenders. The chapter describes international good practices in identifying, quantifying, monitoring, mitigating, recording and disclosing contingent liabilities, with particular attention to the role of finance ministries.

6.1. Introduction

In the last 20 years, fiscal risk management has become an increasingly prominent topic in public finance (see, for instance, Brixi and Schick [2002] for a seminal contribution). New sources of risk and unexpected shocks have highlighted the importance of managing fiscal risks. The 2008-2009 global financial crisis and the coronavirus disease (COVID-19) pandemic from early 2020 dramatically illustrate the magnitude of risks to which public finances are exposed.

Contingent liabilities (CLs) are one of the main categories of fiscal risk, posing challenges for fiscal management and ministries of finance (MOFs). The chapter first defines CLs, presents data on the magnitude of their fiscal impacts and discusses general approaches to their management. The chapter then details the management of CLs from government guarantees, public-private partnerships (PPPs) for infrastructure projects and state-owned enterprises (SOEs). The final section discusses CLs from subnational governments (SNGs), natural disasters, the finance sector and extra-budgetary funds (EBFs).

6.2. Contingent Liabilities and Hidden Debt

6.2.1. Definitions and magnitude of fiscal impacts

CLs are obligations contingent on the occurrence of some uncertain future event. The classic example is a government loan guarantee, but CLs arise from a wide range of sources.

CLs may be either explicit or implicit. Explicit CLs are those established by law or through a contract between the government and a third party, such as guarantees in a PPP contract. Implicit CLs arise from informal pressures on government to support an entity or individuals in financial difficulty. Common examples include government bailouts of the finance sector, support to SNGs or SOEs should they get into financial difficulty and assistance to victims of natural disasters. Accountants and accounting standards use “contingent liability” to refer to explicit CLs.

CLs are important sources of specific fiscal risks defined as unexpected variance between fiscal forecasts and actual outcomes (International Monetary Fund [IMF] 2016). Fiscal risks are usually broken down into macroeconomic risks (e.g., variance in the rate of gross domestic product [GDP] growth or exchange rates), specific fiscal risks arising from narrower sources (e.g., the range of explicit and implicit CLs) and institutional risks (e.g., weak capacity for risk management).

Empirical studies find that explicit and implicit CLs materialize with wide frequency and fiscal cost variance and are highly correlated. A study of CLs in 80 advanced and emerging market economies in 1990-2014 found that the finance sector was the source of the highest costs (Table 6.1). The impacts of CLs are nonlinear and correlated (Figure 6.1). The COVID-19 pandemic further underscored these

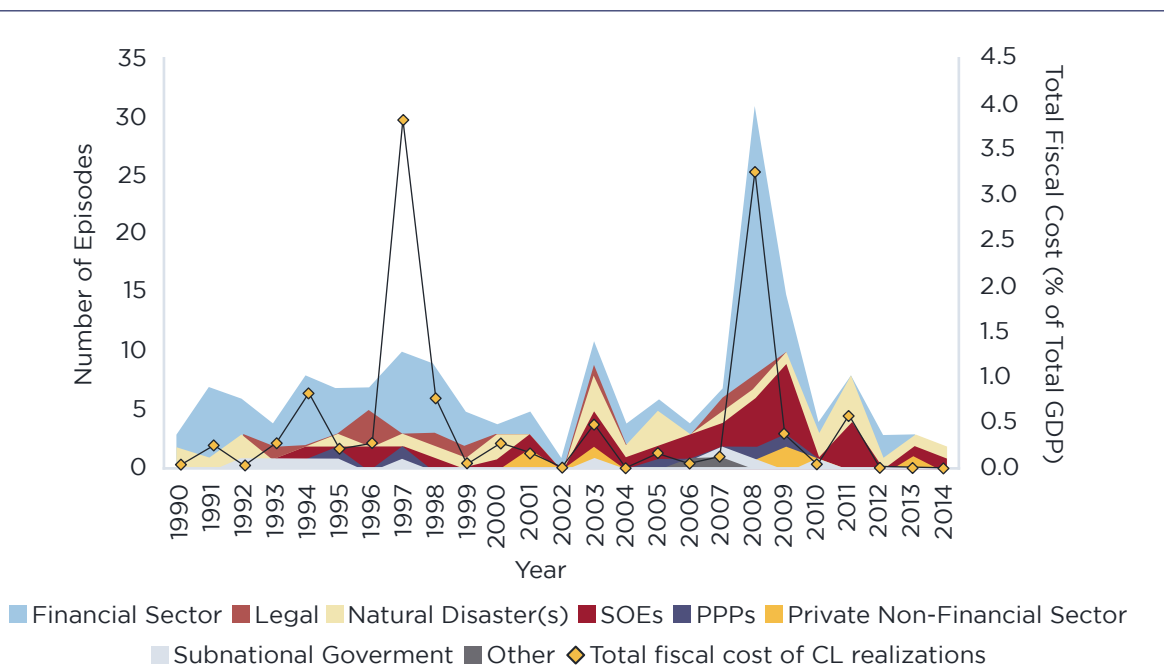
lessons, triggering the largest fiscal risk realization since World War II and leading to policy responses that, while necessary, have often resulted in additional fiscal risk exposures.

Table 6.1. Contingent Liability Realizations

Type of Contingent Liability	Number of Episodes	Episodes with Identified Fiscal Costs	Average Fiscal Costs (% of GDP)	Maximum Fiscal Costs (% of GDP)
Finance sector (private and public financial corporations)	91	82	9.7	56.8
Legal	9	9	7.9	15.3
Subnational government	13	9	3.7	12.0
State-owned enterprises (nonfinancial public corporations)	32	31	3.0	15.1
Natural disasters	65	29	1.6	6.0
Private nonfinancial sector	7	6	1.7	4.5
Public-private partnerships	8	5	1.2	2.0
Other	5	3	1.4	2.5
Total	230	174	6.1	56.8

Source: Bova et al. (2016).

Figure 6.1. Contingent Liability Realizations, by Year and Type



Source: Bova et al. (2016).

CLs have numerous and diverse sources, making them difficult to monitor and manage.

6.2.2. Identification, quantification, mitigation and reporting

Best practices have helped define a fiscal risk management cycle based on six successive steps. Figure 6.2 illustrates such a cycle, developed as an adaptation of the International Organization for Standardization (ISO) standard on risk management (Petrie 2013).

Figure 6.2. Fiscal Risk Management Cycle



Source: Petrie (2013).

Countries have wide-ranging levels of exposure to CLs and resilience and vulnerability to potential fiscal shocks from them. The context includes the broader macroeconomic environment (e.g., the volatility of GDP) and the state of the public finances (e.g., the initial level of the deficit and public debt to GDP, the level of fiscal space given any deficit or debt rules or targets). The context includes the quality of information available to decision-makers in government and the capability to respond to possible CLs (e.g., the legal framework, institutional capability and human resources).

Risk identification is the next key step in risk management. It entails identifying what can happen, how it can happen and the channels through which public finances can be impacted (e.g., impacts on revenues, spending and values of assets and liabilities). The IMF’s Fiscal Risk Assessment Tool helps countries identify the largest and most important sources of fiscal risks that can be the focus of more detailed quantification (Figure 6.3).

CLs' potential fiscal impacts can be quantified using historical data or more elaborate models (e.g., based on financial ratio analyses for public corporations or stability indicators for the financial system). Risks can be quantified using various methods that differ in complexity and data requirements (e.g., sensitivity analyses, alternative scenarios, probabilistic approach, fiscal stress tests). While countries increasingly identify (and disclose) CLs and, in some cases, quantify maximum exposures, less attention is given to estimating the likelihood of their realization. Quantitative estimates could include assessments of the maximum possible loss (e.g., the face value of a guarantee) or, where feasible, the expected fiscal impact or maximum loss at a specific confidence interval.

A fiscal risk register provides a useful starting point for identifying, analyzing and broadly quantifying CLs. In Odisha, India, the register is a 3 x 3 matrix rating CLs (and other risks) by their probability of occurrence and estimated fiscal impact, compiled using available data, analysis and expert judgment (Table 6.2). The scales for likelihood are commonly used, but the scales for fiscal impact should be tailored to individual country circumstances. The United Kingdom (UK) Office of Budget Responsibility (OBR) 2021 fiscal risk statement contained more detailed and advanced examples of fiscal risk registers, with a 3 x 5 matrix rating (UK OBR 2021, 20, Figures 1 and 2).

Table 6.2. Odisha Fiscal Risk Register

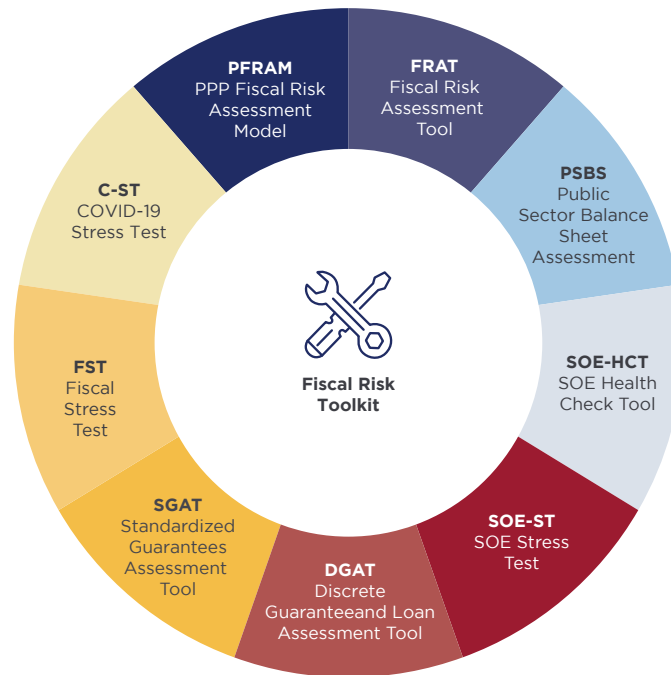
Fiscal Impact¹	High (>0.5% of GSDP)	<ul style="list-style-type: none"> • Growth slowdown • Inflation 	<ul style="list-style-type: none"> • Electricity sector • Mining-related revenues • GST revenues • State share of central taxes 	<ul style="list-style-type: none"> • Natural disaster • Covid-19 shock
	Medium (0.1% - 0.5% of GSDP)		<ul style="list-style-type: none"> • Public sector undertakings • Social security programs • Food supply department 	
	Low (<0.1% of GSDP)	<ul style="list-style-type: none"> • PPPs • Tax refunds under litigation • Pension schemes 	<ul style="list-style-type: none"> • Variation in interest rate • Line departments 	
		Low (<10%)	Medium (10%-50%)	High (>50%)
		Likelihood of realization ²		

GSDP = gross state domestic product.

Note: Public sector undertakings refer to state-owned enterprises.

Source: Department of Finance (Odisha, India) (2021), 2.

The IMF Fiscal Risk Toolkit supports government efforts to strengthen fiscal risk management. The toolkit comprises analytical tools to guide government policy and capacity development (Figure 6.3). The tools help countries identify, quantify, analyze, manage and disclose fiscal risks, and analyze guarantees (one-off or discrete guarantees and standardized guarantee schemes), PPPs and SOEs.

Figure 6.3. International Monetary Fund Fiscal Risk Toolkit

Source: International Monetary Fund Fiscal Risk Toolkit.

Mitigating risks from CLs involves the appropriate allocation of risks between the different parties. The general principles for risk allocation include (1) allocating risk to the entity best placed to bear the risk, (2) ensuring that those who can influence events or exposures bear some risk at the margin and (3) minimizing moral hazard (when intervening, preserve incentives for risk management).

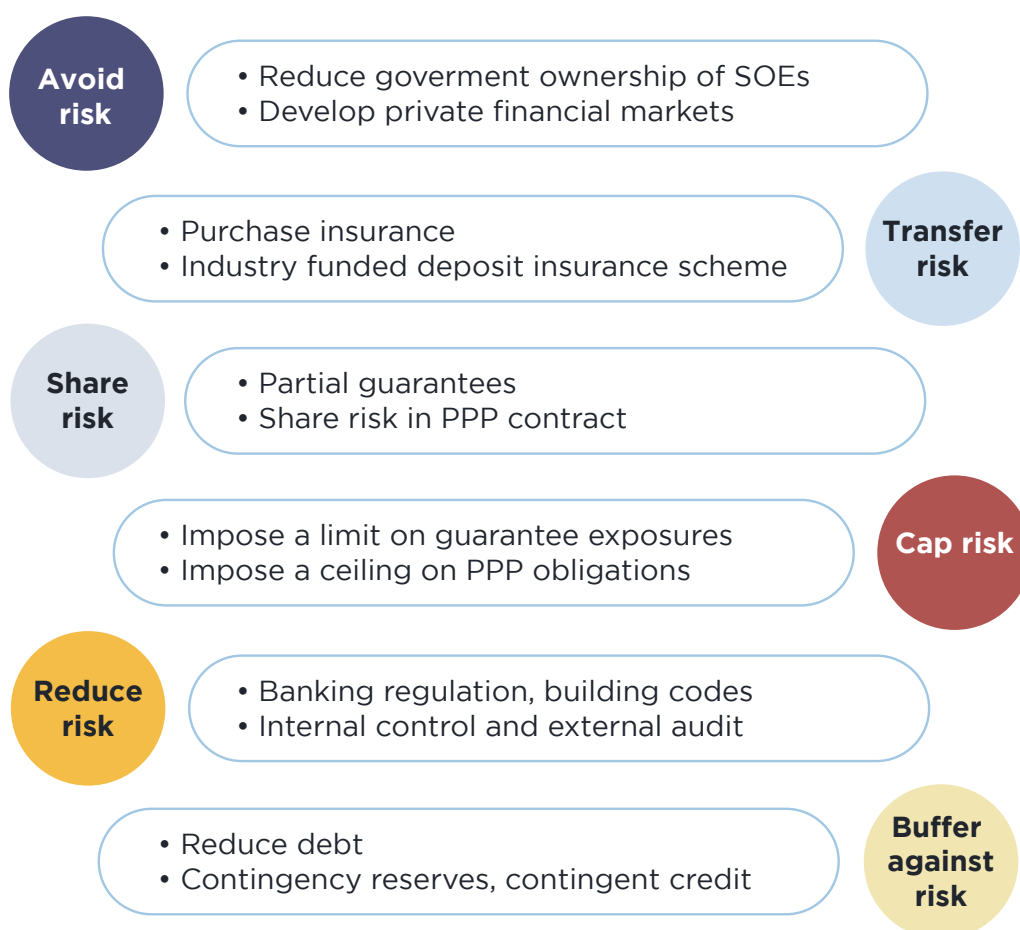
A number of generic approaches can be taken to mitigate fiscal risks from different types of explicit and implicit CLs (Figure 6.4).

Retained CL risks then need to be incorporated into fiscal analysis and in the budget and monitored during the budget year. The level of risk exposure should be considered when setting fiscal objectives (e.g., deciding what a prudent level of public debt is). A contingency appropriation should be included in the annual budget, an allowance should be provided for risks in a medium-term expenditure framework and buffer funds can be considered to meet the costs of larger risks should they materialize. Risks should be proactively monitored across the central government to promote mitigation.

The role of MOFs in managing CLs varies widely across countries. Some have broadened the scope of their debt management offices (DMOs) to include analysis of debt guarantees and credit risk. Others have tasked the DMO with analysis of other specific fiscal risks such as natural disasters, legal claims and PPPs (e.g., Colombia; IMF 2018a). Other countries have widened the remit of the macro-fiscal department to include analysis of selected specific risks. Many MOFs, including

those in advanced countries, have created separate departments or units with specific responsibilities, such as monitoring SOEs, SNGs or PPPs. Finally, a recent trend is establishing a MOF-coordinated fiscal risk committee that meets regularly within the year to monitor the evolution of risks and initiate mitigating actions.

Figure 6.4. Generic Approaches to Mitigating Fiscal Risks from Contingent Liabilities



PPP = public-private partnership, SOE = state-owned enterprise.

Source: Author.

Public reporting of fiscal risks has been emphasized, particularly since the 2008-2009 global financial crisis. Pillar III of the IMF's 2014 Fiscal Transparency Code on Fiscal Risk Analysis and Management contains 12 principles covering the disclosure of information on macroeconomic risks and a range of specific fiscal risks (IMF 2018b). Evidence shows that bond markets consider hidden CLs and that an increasing number of governments are publishing a fiscal risk statement alongside their annual budgets (IMF 2016). More transparent management of and communication around CLs can ease financing conditions for borrowers while supporting sounder action for lenders.

6.3. Managing Guarantees

6.3.1. Types of guarantees and their purpose

Government guarantees can be classified as either one-off guarantees or standardized guarantees. One-off guarantees are issued for a single event or circumstance and include the following:

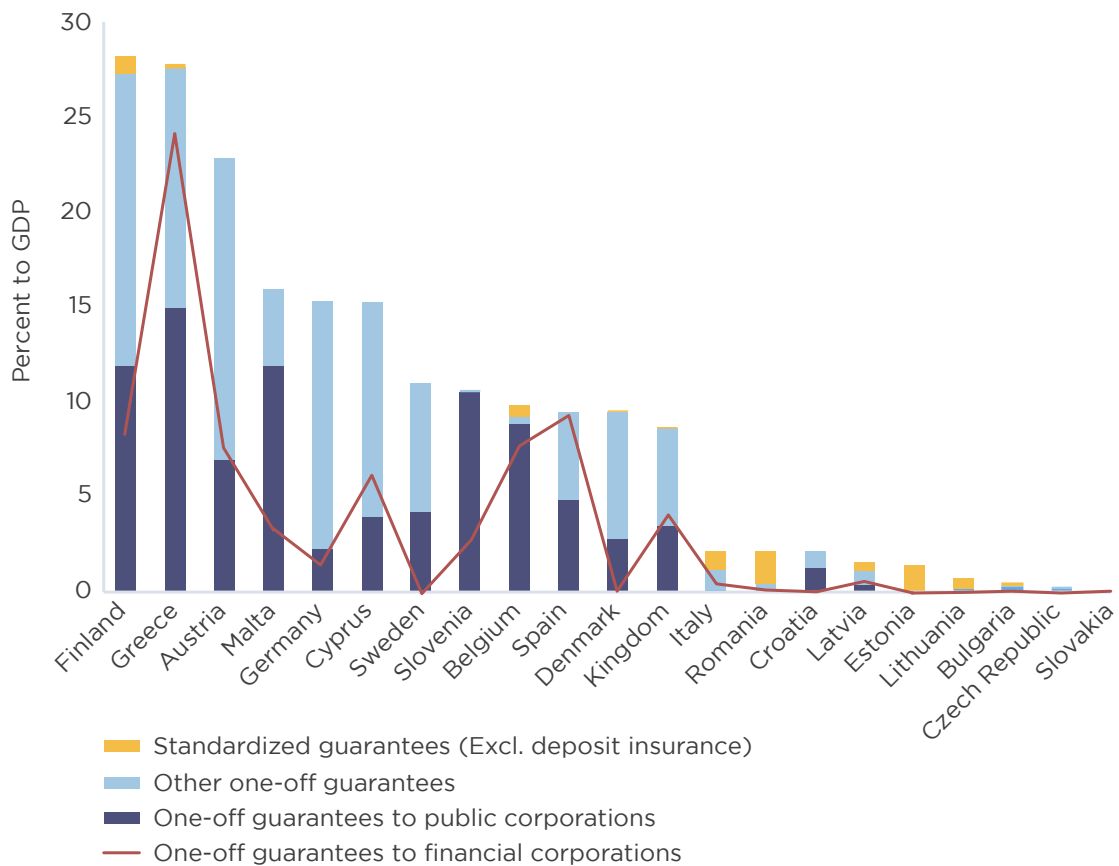
1. Loan (and other debt instrument) guarantees. The government assumes the borrower's debt service obligations (entirely or in part) in case the borrower defaults.
2. Other one-off guarantees, e.g., lines of credit, loan commitments, contingent credit availability, letters of credit.
3. Exchange rate guarantees.
4. Guarantees related to PPPs, e.g., a minimum revenue guarantee.

Standardized guarantees are issued to many beneficiaries with standard terms and conditions and pooling of risks. The guarantees are often provided and managed by specialized institutions outside the core government, could be for fairly small amounts and include the following:

1. Umbrella guarantees to financial institutions for specific types of loans such as those for mortgages, students, small and medium-sized enterprises and agriculture, and export credits.
2. Government insurance schemes such as deposit insurance, crop insurance and natural disaster insurance, where the government guarantees the recovery, in full or part, of loss incurred by the beneficiaries under prespecified circumstances.
3. Pension guarantees, where the government guarantees a minimum return or minimum pension level.

SOEs and SNGs may issue guarantees carrying an explicit counter-guarantee of the national government. Governments have issued broad, blanket guarantees to many financial institutions to restore financial stability during crises (e.g., during the 2008-2009 global financial crisis).

The level of exposure of governments to guarantees varies widely. For example, Figure 6.5 shows the stock of general government guarantees by type in European countries in 2015 (Saxena 2017). The gross exposure of governments to guarantees exceeds 15% of GDP in some of these advanced European countries.

Figure 6.5. Stock of Government Guarantees in European Countries, 2015

GDP = gross domestic product.

Note: Represents stock of general government guarantees at nominal value; excludes debt assumed by the government.

Source: Eurostat.

6.3.2. Design of guarantees

Guarantees are often issued for the wrong reasons. They are sometimes issued to escape the scrutiny and discipline of the budget process. Under cash accounting, recognition of the fiscal impact of a guarantee is deferred until—and if—they are called. Guarantees may shift risk and future costs to the government in a PPP contract while lowering the apparent upfront cost. Governments sometimes give guarantees to defer necessary but painful policy reforms or enterprise restructuring and even, at times, to provide illicit assistance to favored persons.

Explicit criteria should, therefore, be applied when considering whether to provide a guarantee and how to design it. The criteria should cover the rationale for issuing a guarantee, its design, risk mitigation measures and affordability (Box 6.1).

A guarantee may be warranted under certain circumstances. Financial guarantees can help build investor confidence, open new markets or improve the financing terms for the guaranteed counterparties such as SNGs or SOEs. Guarantees may

be considered to attract private financing in projects where specific risks are under the government’s control, such as political and regulatory risks that are difficult for the market to bear through pricing or insurance. In other cases, a project may have positive economic and social benefits but entail risks that the private sector will not accept without a guarantee (e.g., supply of electricity in rural areas). Government guarantees in PPP projects are nearly always structured as performance guarantees, not financial guarantees.⁷⁵

Box 6.1. Criteria for Assessing the Justification for a Guarantee

The rationale:

Why is a guarantee justified? Is there a strong public policy case?

Is a guarantee superior to a loan, grant, capital or operating subsidy, in-kind grant, equity investment or other instrument?

Why decide now? Can the decision be deferred until consideration against competing priorities in the annual budget cycle?

The exposure: Maximum size, duration.

The risk and return: What are the triggers, likelihood, expected cost, fee and return?

Risk mitigation: Who will manage the exposure and how? Is government being compensated? How will residual risk be monitored and managed?

Affordability:

Could the Ministry’s budget bear the cost if called?

What would be the impact of a call on public debt?

Would the impact be consistent with the medium-term debt strategy and any debt limits or rules?

What is the context: the size of the stock of guarantees to GDP; the main sectors and exposures; recent trends in exposures and in calls on guarantees.

GDP = gross domestic product.

Source: United Kingdom Treasury. 2017. Contingent Liability Approval Framework. London.

Guarantees complicate fiscal management. Because of their uncertain fiscal impacts, they will often result in no cost to government over the life of the guarantee but may result in a significant cost at some future date. They can create undesirable incentives for recipients of guarantees (e.g., managers of guaranteed entities may take on higher levels of risk). Guarantees are often not “called” because the government wants to avoid a default, choosing instead to provide temporary debt-servicing support (a “credit event” [Bachmair 2016]). Finally, guarantees tend to be called just when the fiscal position is deteriorating for other reasons—when it rains, it pours.

6.3.3. Quantifying and pricing guarantees

To the extent feasible, estimates should be made of the probability of a guarantee being called and of its cost if called. Cost is typically assessed in terms of “expected payment”—the probability-weighted payment, expressed in present value terms, referring to the most likely payment a government would be expected to make by

⁷⁵ A financial guarantee assures repayment of money in the event of non-completion of the contract by the client. A performance guarantee provides an assurance of compensation in the event of inadequate or delayed performance on a contract.

extending a guarantee. Expected loss has three components: **exposure at default** times **loss given default** times **probability of default**. Loss given default defines how much (what proportion) of the exposure is lost given a default (i.e., exposure and loss are two different concepts because of recoveries, restructurings and other mitigating mechanisms).

For standardized guarantees schemes, historical loss data on the actual pool of guarantees (or a similar pool of guarantees) can provide a reasonable estimate of the expected loss. A simpler alternative approach is to use, where available, the market price differential between a guaranteed and a similar nonguaranteed debt as a proxy for the value of a guarantee. Reliable estimation of probabilities can be technically challenging for one-off guarantees.

Countries such as Indonesia, Australia, Chile, Colombia, Sweden and Türkiye have developed quantitative methods modeled on standard credit-risk evaluation techniques to estimate default probability and the associated losses. These countries typically make use of one or more of three main approaches: (1) credit rating-based risk assessment, (2) financial analysis (e.g., ability to pay, liquidity, profitability and leverage analysis) and (3) statistical modeling or scenario analyses based on stochastic simulations. Each methodology has its own data requirements and outputs. Users of those methodologies are advised to choose the model that best fits their needs, resources and capabilities.

Pricing of guarantees depends on the policy objective in providing the guarantee. In general, government should charge the full expected cost based on estimated loss given default when it does not intend to subsidize the recipient. Where the degree of fiscal risk aversion is high (e.g., when fiscal space is limited) the recipient may be charged more than the estimated loss given default (e.g., the value at risk or even the exposure at default). A government may charge less than the expected cost when the policy objective is to subsidize the guarantee recipient and policy justification exists for doing so.

6.3.4. Managing guarantees

A number of general approaches may be taken to manage fiscal risks from guarantees (Figure 6.6).

Institutional mechanisms to reduce risks from guarantees include the legal framework, approval processes and accounting and control mechanisms. The mandate to issue guarantees should be specified in legislation, including the authorizing body (e.g., the legislature or minister of finance), information to be provided by beneficiaries, the basis for decision making and transparency requirements. Approval should be centralized, with the MOF assigned a formal gatekeeping role. *Ex ante* financial viability assessments of beneficiaries should be required and proposed guarantees decided as far as feasible in the annual budget cycle.

Figure 6.6. Generic Approaches to Managing Fiscal Risks from Guarantees

PPP = public-private partnership, SNG = subnational government.

Source: Author.

A guarantee register assists internal control, external audit and disclosure of guarantees and may be required by government accounting standards. Good practice requires MOFs to maintain a central registry and/or database of guarantees supported by an information system to ensure availability of up-to-date information and facilitate monitoring. The register should contain a list of all guarantees; the issuer, recipient, purpose and maturity; the gross exposure for each; and information to estimate the probability of a call (e.g., any historical loss data). Line ministries may also be required by the MOF budget call circular (guidance on preparation of the next annual budget) to provide information on guarantees (and other contingent liabilities and fiscal risks) with their annual budget submissions.

Allowance for retained risks needs to be incorporated into budgets. In cash-based budgeting, the expected cost of calls on issued guarantees may be budgeted (e.g., in a general contingency appropriation that lapses if not fully spent at the end of

the year), or the estimated expected cost of new guarantees may be budgeted.⁷⁶ Where exposures are sizeable, a general allowance for calls on guarantees could be included in the medium-term expenditure framework, a guarantee reserve fund created and/or a ceiling imposed on the issuance of new guarantees or on the outstanding stock of guarantees (Saxena 2017).

Guarantees need to be actively monitored. MOF should routinely check the finances of all recipients of government guarantees (including guarantees in PPP contracts). Monitoring should focus on areas of greatest risk. Many countries need to strengthen the link between the guarantee management framework and the oversight of SOEs and SNGs, typically the main recipients of government guarantees. MOF should consolidate and regularly advise government on the overall level of risk from guarantees and cost-effective actions to reduce it.

Information on guarantees should be published. Guarantees should be disclosed (together with other CLs) in annual budget documents and notes to the year-end financial statements. Principle 3.2.3 of the 2014 IMF's Fiscal Transparency Code stipulates the information to be published on guarantees, while principle 3.2.1 covers disclosure of budgetary contingencies.

Management of guarantees requires MOFs to have a range of capabilities. MOFs need to develop capacity to estimate guarantee exposures, incorporate exposures into fiscal analysis, adopt approaches to accounting and reporting, advise on rules for budgeting, be able to cost guarantees and determine the guarantee fees to be charged, and develop guidance on the methodologies and assumptions to be used when analyzing guarantees. Beyond reporting the gross value of guarantee exposures, the more advanced elements involving quantifying potential costs are found mainly in advanced and some middle-income countries. Typically, government debt managers are better equipped to conduct guarantee risk assessments than other parts of MOF. DMOs are interested in monitoring the government's overall creditworthiness, which guarantees can affect. The pricing of a guaranteed debt can indicate the pricing of the government's debt. DMOs often record and monitor guarantees as part of their back-office functions.

The sound management of government guarantees supports sound relationships between borrowers and lenders. Well-analyzed decisions on when to use guarantees and their design and the sound allocation of risks between borrowers and lenders contribute to robust borrowing decisions. Such decisions increase the prospect that government guarantees and the contracts in which they are embedded achieve the objectives of all parties.

Six key takeaways or messages on the management of fiscal risks from guarantees are as follows:

1. One-off and standardized guarantees are important sources of fiscal risks, although exposures vary widely across countries.

⁷⁶ In the small number of countries that budget on an accrual basis, the net present value of a guarantee is appropriated where a 50% probability of a future payment is judged to be required, and the payment amount can be reasonably estimated.

2. Government guarantees can help open new markets, improve financing terms for subnational governments or SOEs or attract project finance to PPPs.
3. Guarantees complicate fiscal management because of their uncertain budget impacts and potential correlation.
4. A range of measures mitigates risks from guarantees, including centralized controls over issuance, design and pricing, accounting, budgeting and monitoring of recipients.
5. Various methodologies can quantify and price guarantees, depending on their characteristics and potential constraints (e.g., data availability, frequency and timeliness).
6. Best practices entail having a specific institutional framework to manage guarantees, including ensuring guarantees and their potential risks are fully transparent, especially to support sound lender and/or borrower relationships.

6.4. Fiscal Risks in Public-Private Partnerships for Infrastructure: Risk Allocation and Mitigation

PPPs are long-term contracts (25, 30 or more years are common) where the private sector supplies infrastructure assets and services traditionally provided by the government. PPPs involve private execution and financing (private capital at risk) of public infrastructure assets, with performance-based contracts linking payments to the quantity and/or quality of services. The private company receives a revenue stream—from government budget allocations, user charges or a combination—depending on the contracted service’s availability and quality. In addition to budget allocations, the government may make further contributions (e.g., land, guarantees and other contingent obligations, rights of way).

PPPs involve partial risk transfer to the private sector, but the government retains significant risks, and shocks can impose a major, unexpected burden on public finances. Box 6.2 outlines the main types of CLs in PPP contracts.

Infrastructure PPPs create significant fiscal risks for many reasons. They generate potentially significant long-term debt-like obligations as well as CLs. Yet, governments tend to treat those PPPs outside the budget cycle or medium-term fiscal framework, bypassing MOF’s role as the fiscal gatekeeper. PPPs are generally of limited transparency in budgets and fiscal reporting. Governments may have weak monitoring capacity, and renegotiations may be frequent and tend to favor private sector operators.

The IMF’s PPP Fiscal Risk Assessment Model (PFRAM) can be used to estimate the fiscal implications of an infrastructure PPP contract (IMF Fiscal Risk Toolkit). Doing so involves gathering specific project information and making judgments

about the government's role at key stages of the project cycle. For example: Who initiates the project? Who controls the asset? Who ultimately pays for the asset? Does the government provide additional support to the private partner? PFRAM projects private cash flows and public liabilities over time and then "shocks" them to generate a spectrum of potential fiscal costs. PFRAM calculates fiscal impacts (cash and accrual), generates outputs in tables and chart form and can be used to conduct sensitivity analysis.

Box 6.2. Types of Government Contingent Liabilities in Public-Private Partnerships

1. Loan guarantees.
2. Exchange rate guarantees.
3. Demand guarantees, e.g., the government may take on a minimum revenue guarantee in a toll road public-private partnership, under which it finances the cost of services if demand is below a specified volume.
4. Compensation clauses, e.g., a commitment to compensate the private party for loss due to uninsurable natural events.
5. Termination payment commitments, e.g., a commitment to pay an agreed amount should the contract be terminated due to default by the public or private party.
6. Indemnities, e.g., against the impacts of government policy changes in the sector.
7. Guaranteed residual asset transfer prices at which the government will purchase the assets at the end of the contract.
8. Other fiscal risks for government, such as land acquisition cost risk and the risk of legal action over the life of the contract.

Source: Author.

A range of approaches mitigates and manages the fiscal risks from infrastructure PPPs. The first step is to ensure that the policy framework and criteria are clear on when government may enter a PPP contract and on how risks should be allocated between the parties (e.g., partial guarantees to ensure that the operator bears some risk at the margin, government should bear the risk of policy change, the operator should bear construction risk and other risks it can influence). Restrictions should be placed on consideration of unsolicited PPPs, a proposed PPP should be compared and appraised against a standard public investment project, MOF should act as a fiscal gatekeeper and government should draw on expert advice and independent review.

A register of infrastructure PPPs should be maintained, with transparency of contracts and disclosure of terms. Details of explicit government guarantees should be included in the government's reporting of CLs, and any tax incentives included in a tax expenditure report. Where material, future payment obligations in PPPs should be included in a debt sustainability analysis and a legal limit placed on accumulated obligations (IMF 2018b).

6.5. Managing Fiscal Risks from State-Owned Enterprises

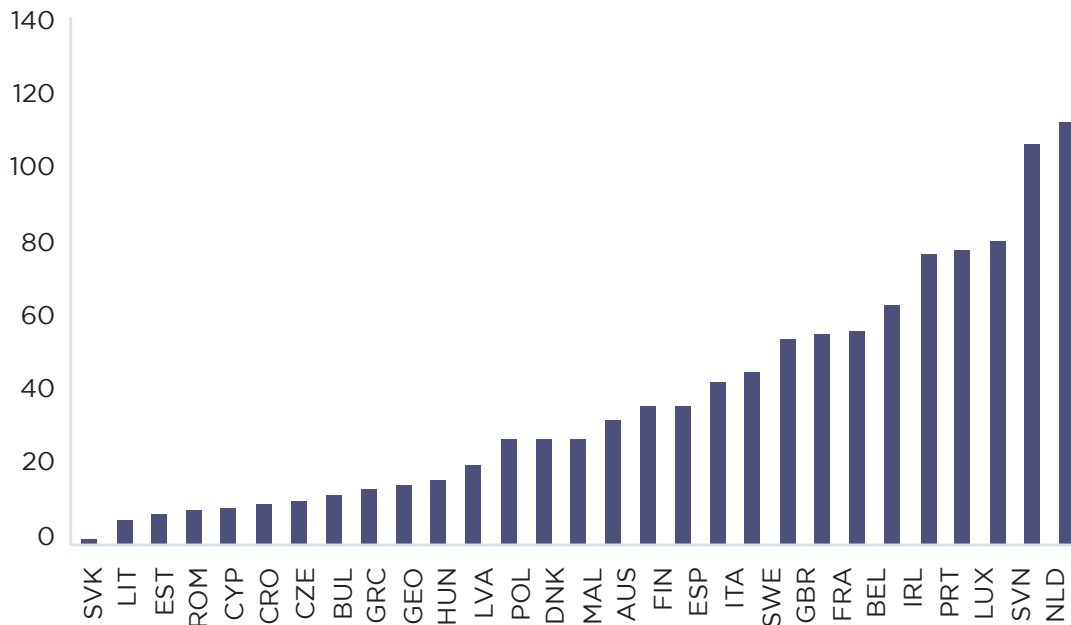
Nonfinancial SOEs are a major source of CLs. Bova et al. (2016) found 32 episodes from 1990-2014, with an average fiscal cost of 3% of GDP and a maximum fiscal cost of 15% of GDP (Table 6.1). Fiscal risks from SOEs arise from several sources, including government-guaranteed debt; non-guaranteed SOE debt, which represents an implicit government guarantee; fluctuations in taxes, royalties, dividends and the value of government equity; requirements for capital from government for new investment (on-lending or capital injections) or operating subsidies; and requirements for periodic government bailouts. The multiple direct and indirect links with the government budget require focused oversight, scrutiny and a range of measures to mitigate risks.

Quasi-fiscal activities (QFAs) are a driver of some of those risks. QFAs are unfunded, noncommercial activities performed by SOEs at the direction of government (e.g., provision of goods and services to the public at prices below cost). QFAs can lead to ongoing losses, underinvestment and/or excess borrowing that can result in the need for fiscal support. Quantifying QFAs helps ensure that policymakers are aware of their costs. Good practice is to finance noncommercial activities by SOEs from the government budget or to eliminate them.

Governments use a wide range of instruments to provide fiscal support to SOEs, including guarantees of SOE borrowing, interest rate subsidies, departure from normal economy-wide regulatory requirements, preferential treatment in public procurement, reduced tax rates (including tolerance of tax arrears) and access to preferential financing.

Country context, risk drivers and triggers influence fiscal risks from SOEs. Context includes the size of the sector to GDP (Figure 6.7). Key risk drivers include how many SOEs depend entirely on the government budget and the extent of QFAs. The main risk triggers are the inability to service debt, cash flow problems in implementing projects and changes in macroeconomic parameters, including key commodity prices.

SOEs pose difficult governance challenges. The existence of a complex chain of actors—corporation management, boards, line ministries, central finance agencies, government ministers and the legislature—can result in poor governance and exacerbate risks. Governments sometimes use public corporations to get around traditional fiscal controls or provide political patronage. Some SOEs may be heavily dependent on the state budget and should not be classified as SOEs in the first place. Government oversight of its SOEs ranges from centralized to highly decentralized arrangements, although some movement toward centralization is seen (OECD 2015, 2020, 2021). Avoiding passive ownership and excessive state intervention is never easy.

Figure 6.7. Liabilities of Financial and Nonfinancial Public Corporations in Europe, 2015

Note: Data use International Organization for Standardization (ISO) country codes.

Sources: Eurostat, country authorities, International Monetary Fund (IMF) staff estimates, IMF (2018).

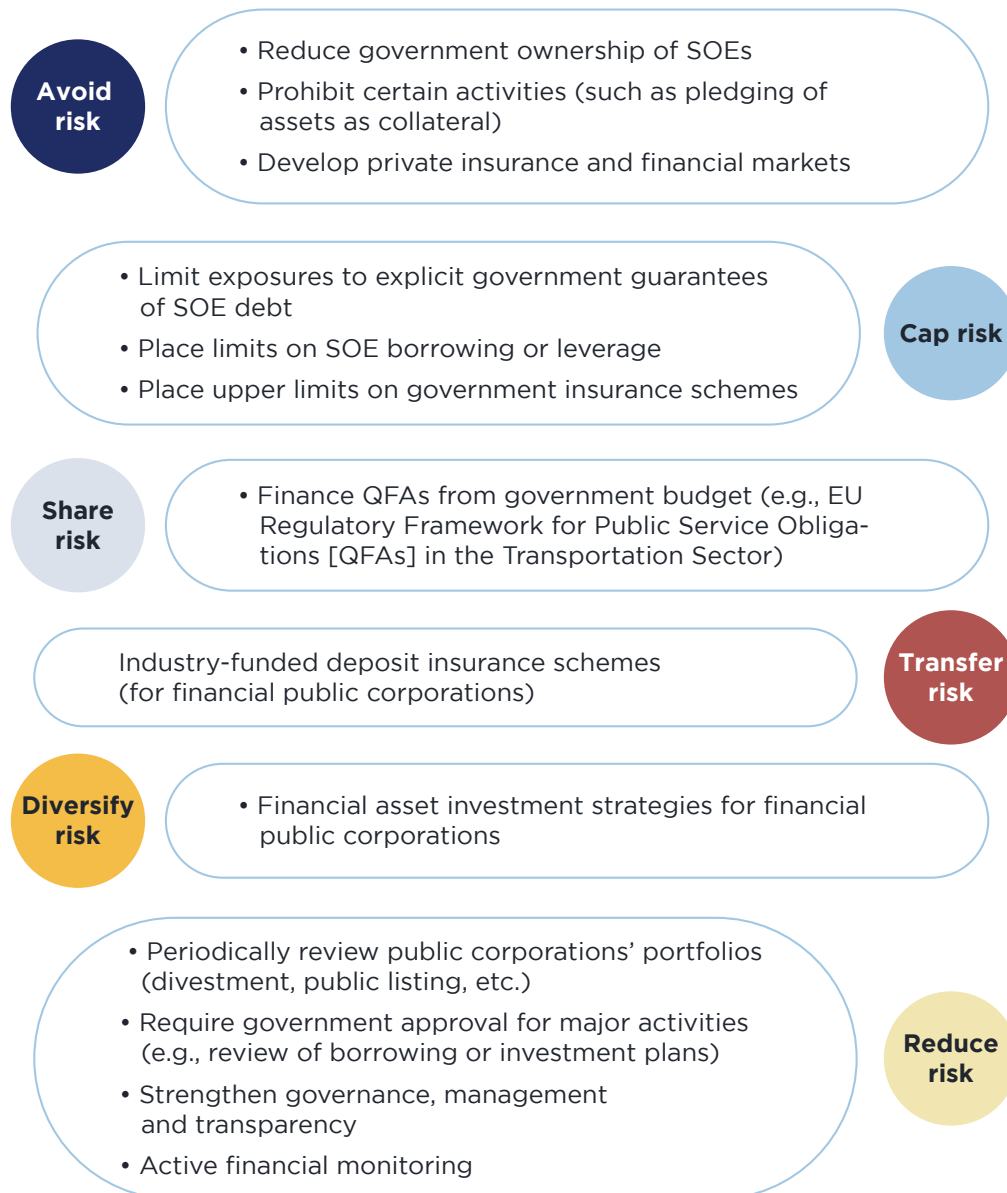
Government oversight of fiscal risks from SOEs must be progressively strengthened in many countries. Allen and Alves (2016) proposed a general risk-based and sequenced approach to improve government oversight, tailored to individual country starting points and circumstances. The elements of their approach cover the definition, classification and status of SOEs; the government's broad ownership policy; disclosure of the mandate of each SOE; strengthening of the legal framework; setting up of an SOE oversight unit in MOF; establishment of central financial control and approvals; and publication of an annual public corporation monitoring report.

Monitoring of fiscal risks from SOEs has five key criteria and related ratios to assess a company's viability: liquidity (the ability of a company to fulfill its short-term financial obligations), solvency (ability to honor long-term obligations with current and future revenue generation), profitability, financial performance (ability to maintain its costs under control) and relationship with government (ability to operate at arm's length from the government, without any form of support and any financial obligations to the government).

Transparency of fiscal risks from SOEs is important. The IMF's Fiscal Transparency Code outlines basic, good and advanced practices in Principle 3.2.2. Advanced practice discloses all direct and indirect support between the government and public corporations. Based on a published ownership policy, a report on the overall financial performance of the public corporation sector, including estimates of any QFAs undertaken, is published at least annually. The Philippines and South Africa provide examples of good practice in the information they publish on SOEs in their annual fiscal risk statements, which accompany the government budget.

Several generic approaches reduce fiscal risks from SOEs and public financial corporations (Figure 6.8).

Figure 6.8. Generic Approaches to Managing Fiscal Risks from State-Owned Enterprises and Public Financial Corporations



EU = European Union, QFA = quasi-fiscal activity, SOE = state-owned enterprise.

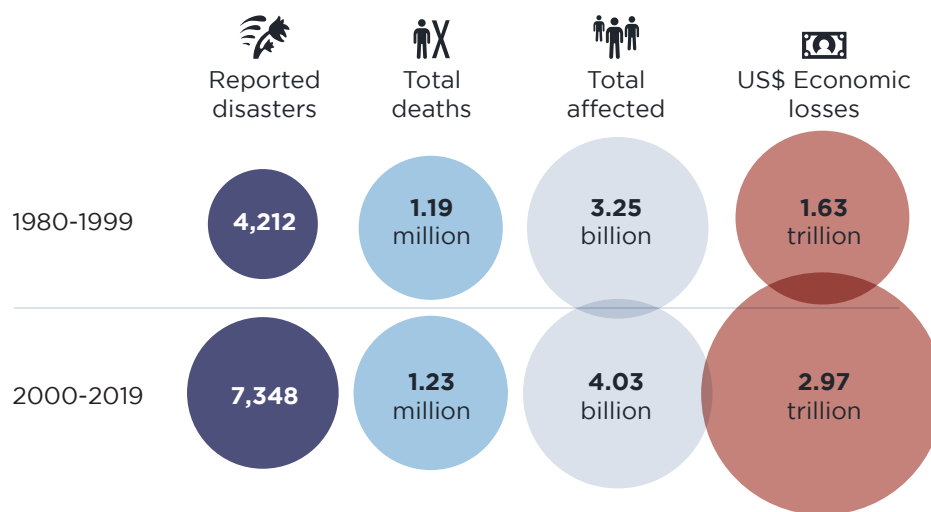
Source: Author.

6.6. Fiscal Risks from Natural Disasters, Subnational Governments, the Finance Sector and Extra-Budgetary Funds

6.6.1. Natural disasters

Natural disasters are an increasingly prominent source of fiscal risk. The average fiscal cost of disasters in 1990-2014 was 1.5% of GDP, with a maximum cost of 6% (Table 6.1), although losses can exceed 100% of GDP in small developing countries. Climate change is expected to increase the incidence and cost of disasters significantly. Figure 6.9 illustrates the growing incidence and impacts of disasters in 2000-2019 compared with the previous two decades. Besides physical risks from disasters, climate change creates fiscal risks from “transition risks”—risks arising from the transition to a low-carbon economy, such as the loss of revenues from taxes on petrol and the risk of “stranded assets” as public investments in high-carbon infrastructure lose value (Dunz and Power 2021).

Figure 6.9. The Increasing Incidence of Disasters



Source: Centre for Research on the Epidemiology of Disasters (2020).

Disasters create explicit fiscal risks (e.g., damage to government property, legal obligations to provide disaster relief) and implicit fiscal risks (e.g., nonlegal pressures to provide relief to households). Central government support to local governments, often ad hoc and unplanned, can create large implicit CLs, too. The extent governments provide explicit support to external parties affected by disasters varies widely across countries (OECD and World Bank 2019). Clearly defining the responsibility of the state to reduce the government’s implicit risk and encourage other parties to reduce their own risk has some advantages. Implicit risks, and public expectations, can grow over time; for instance, in the United States, evidence exists that the federal government

is taking on an increasing share of economic losses from hurricanes (Kunreuther and Michel-Kerjan 2013).

A wide range of approaches reduces the fiscal risks from climate-related disasters, including implementing a national disaster risk management strategy, sharing risk through the design and implementation of government disaster insurance schemes, transferring risk through insurance and other instruments and establishing a budget contingencies appropriation and, where risks are large, a disaster fund. Finally, transparency of the fiscal risks from disasters is important, in line with Principle 3.2.7 in the IMF Fiscal Transparency Code (IMF 2018b). Gesquierre and Mahul (2010) put forward a layered approach to disaster risk financing, which is being implemented in countries such as the Philippines.

6.6.2. Fiscal risks from subnational governments

SNGs can account for a large share of general government spending and pose significant explicit and implicit fiscal risks. Bova et al. (2016) found 13 subnational bailouts from 1990-2014, with an average fiscal cost of 3.7% of GDP and a maximum cost of 12%.

Approaches to managing CLs from SNGs depend on a country’s constitutional arrangements. Unitary states may impose controls on SNG borrowing. Doing so is less possible in federations, which rely more on negotiated arrangements and, in some cases, market discipline (Table 6.3) (IMF 2018, Table 4.4). Colombia provides an example of advanced practice in managing the fiscal risks from SNGs. Following financial difficulties in the 1990s, the “Traffic Light Law” was adopted in 1997 under which SNGs are given a rating based on their ratios of debt to payment capacity. SNGs rated in the red-light zone are prohibited from borrowing. The national government must submit an annual report to Congress on the financial viability of SNGs (IMF 2018).

Table 6.3. Different Approaches to Managing Subnational Fiscal Risks

	Direct Controls	Rules-Based Regulations	Cooperation	Market Discipline
Approach	Require central approval to borrow, Set annual limits on borrowing, Centralize borrowing in a single authority	Fiscal rules (e.g., deficit or debt rules) set through national legislation	Limits or rules established through negotiation agreements	No direct controls on borrowing
Advantages	High degree of central control	Transparent	Enhanced responsibility	Emphasis on self-control with external constraints
Preconditions	Constitutional and legal underpinnings	Credible rules, Transparent reporting, Monitoring and enforcement mechanisms	Culture of fiscal discipline	Well-developed capital markets, Transparent reporting, Track record of no bailouts
Country Examples	India, Georgia	Spain	Austria Denmark Australia	United States Canada

6.6.3. Finance sector

The finance sector has been the largest single source of fiscal risk in recent decades. From 1990-2014, government rescues of troubled public and private financial institutions had an average cost of about 10% of GDP, and 57% in the most extreme case (Bova et al. 2016). During the same period, 91 episodes of rescues of financial institutions occurred.

Governments can take various measures to mitigate fiscal risks from the finance sector. They can review the extent of public ownership of financial institutions. They can strengthen capital adequacy standards for banks. They can strengthen prudential regulation of banks by the central bank. They can increase transparency requirements to strengthen market discipline of risk taking. They can establish or reform deposit insurance schemes. And, since the 2008-2009 global financial crisis, central banks have been strengthening macro-prudential policy and transparency to limit systemic risk.

The IMF Fiscal Transparency Code's Principle 3.2.5 stipulates that the government's potential fiscal exposure to the finance sector be analyzed, disclosed and managed. Advanced practice is that the authorities quantify and disclose their explicit support to the finance sector annually and regularly assess its stability based on a plausible range of macroeconomic and financial market scenarios (IMF 2018b, 123-5). In Finland, the central bank, the Financial Supervisory Authority and the European Central Bank all publish comprehensive reports on finance sector risks, and the government includes a discussion of the risks in its annual statement of fiscal risks.

6.6.4. Extra-Budgetary Funds

EBFs are a further source of fiscal risks. They are general government entities, often with separate banking and institutional arrangements not included in the annual budget law. EBFs represent on average almost half of central government expenditure across a range of advanced, middle-income and low-income countries. EBFs conduct numerous functions and are often subject to less oversight and control than government ministries and departments. Social security funds are the single most dominant form of extra-budgetary activities, representing about a third of total expenditures.

Allen and Radev (2010) put forward criteria for evaluating and reforming EBFs, which can be used to mitigate fiscal risks from EBFs (Box 6.3).

Box 6.3. Criteria for Evaluating and Reforming Extra-Budgetary Funds

1. Does a satisfactory economic, governance and political economy case exist for establishing the extra-budgetary fund (EBF)?
2. Is the EBF adequately classified according to the guidelines in the International Monetary Fund's *Government Finance Statistics Manual 2014*? If so, are the procedures for preparing and executing its budget and financial reporting comparable to the government's overall framework for managing budgetary expenditures and revenues?
3. Where the EBF is financed by earmarked taxes, are the arrangements for collecting these revenues satisfactory and compatible with the overall efficiency of tax policy and tax administration?
4. Is the legal basis for the EBF adequate in terms of financial management and reporting?
5. Is the governance structure of the EBF compatible with the objectives of sound financial management?
6. Is the EBF's budget presented to the legislature parallel to the state budget and subject to a similar scrutiny process? If so, how integrated is the EBF with the government's fiscal objectives?
7. Is the EBF's budget subject to audit by the supreme audit institution according to a comparable process and timetable as the general budget?

Source: Allen and Radev (2010).

6.7. Conclusion

A sovereign's creditworthiness and the sustainability of its debt depend on its explicit financial obligations and those it might have contingent on certain future events. CLs complicate fiscal management because of their uncertain fiscal impacts, which impose demanding data, analytical and capacity requirements. The triggering of explicit and implicit CLs is often correlated with each other ("it never rains, but it pours") and can be extremely expensive. CLs can create undesirable incentives for those who would benefit from them and, at times, are taken on by governments to bypass standard fiscal and budget controls. CLs pose particular challenges for MOFs.

The last 20 years have seen significant advances in the management of CLs. While in 2002, generally accepted fiscal risk management principles or good practice guidance on managing CLs did not exist (Brix and Schick 2002), interest in the field has been burgeoning since then. Following the 2008-2009 global financial crisis, many advanced and middle-income countries put new arrangements in place to identify, quantify, mitigate and disclose a range of CLs. These include implicit CLs relating to the finance sector and frameworks to ensure scrutiny of explicit government guarantees before they are granted, including those in infrastructure projects. The field of disaster risk management has seen major advances in countries at all levels of development, strengthening disaster preparedness and response and introducing new approaches to transferring risk through disaster insurance.

However, much remains to be done to improve the management of explicit and implicit CLs. CLs in PPPs for infrastructure projects remain challenging because of the complexity and long terms of the contracts. A key ongoing weakness in many countries is the lack of a centralized and systematic approach to managing fiscal

risks from CLs across government, although advances are apparent in countries at all levels of development. A recent innovation has been the establishment of centralized fiscal risk committees in MOFs to consolidate data and analysis and to monitor and mitigate the full range of fiscal risks. However, in many developing countries, the management of CLs remains basic.

The management of implicit CLs is problematic because of political economy factors; governments are often reluctant to acknowledge whether and to what extent they "stand behind" their finance sector, SOEs, SNGs, distressed PPP operators or the victims of natural disasters. More fundamentally, however, the COVID-19 pandemic has seen government bailouts extend into large areas of the real economy, and the 2022 energy price surge has led many governments to subsidize households' energy bills massively. Together with the 2008-2009 global financial crisis, the pandemic period and 2022 have been described as an era of "bail-outs for everyone" (The Economist 2022). Implicit CLs put political pressure on governments to provide fiscal support and remain the most challenging and unpredictable source of fiscal risks. The six key takeaways or messages on managing CLs and hidden debt are as follows:

1. Sources of fiscal risks and contingent liabilities are numerous, diverse and sometimes correlated.
2. Managing CLs requires a systematic framework distinguishing between explicit and implicit CLs and recognition, especially for implicit CLs, that the past is not a good predictor of future risks.
3. Analyses of fiscal risks from CLs should be fully incorporated within the budget cycle.
4. Financial ratios, credit analyses and other models and/or statistical tools can be used to assess the evolution of fiscal risks from CLs.
5. More transparent management of and communication around CLs by governments can ease financing conditions for borrowers while supporting sounder action for lenders.
6. Various materials are available to support more effective management of fiscal risks from CLs, including tools developed to help analyze, quantify, manage and report CLs.

References

- Allen, R. and D. Radev. 2010. *Extrabudgetary Funds*. Washington, DC: International Monetary Fund.
- Allen, R. and M. Alves. 2017. *How to Improve the Financial Oversight of Public Corporations. How to Notes*. International Monetary Fund, Washington, DC.
- Bachmair, F. 2016. *Contingent Liabilities Risk Management: A Credit Risk Analysis Framework for Sovereign Guarantees and On-Lending Country Experiences from Colombia, Indonesia, Sweden, and Turkey*. World Bank Policy Research Working Paper 7538. World Bank, Washington, DC.
- Baum, A., P. Medas, A. Soler, and M. Sy. 2021. *How to Assess Fiscal Risks from State-Owned Enterprises: Benchmarking and Stress Testing. How to Notes*. International Monetary Fund, Washington, DC.
- Bova, E., M. Ruiz-Arranz, F. Toscani, and H. Elif Ture. 2016. *The Fiscal Costs of Contingent Liabilities: A New Dataset*. IMF Working Paper No. 16/14. International Monetary Fund, Washington, DC.
- Brixi, H. P. and A. Schick, eds. 2002. *Government at Risk: Contingent Liabilities and Fiscal Risk*. New York: Oxford University Press.
- Centre for Research on the Epidemiology of Disasters. 2020. *Human Cost of Disasters 2000-2019*. Cred Crunch 61. United Nations Office for the Coordination of Humanitarian Affairs, New York.
- Cevik, S. and G. Huang. 2018. *How to Manage the Fiscal Costs of Natural Disasters. How to Notes*. International Monetary Fund, Washington, DC.
- Department of Finance (Odisha, India). 2021. *Fiscal Risk Statement 2021*.
- Dunz, N. and S. Power. 2021. *Climate-Related Risks and Ministries of Finance: An Overview*. Washington, DC: Coalition of Finance Ministers for Climate Action.
- Gamper, C., B. Signer, L. Alton, and M. Petrie. 2017. *Managing Disaster-Related Contingent Liabilities in Public Finance Frameworks*. OECD Working Papers on Public Governance 27. Organisation for Economic Co-operation and Development, Paris
- Gesquierre, F. and P. Mahul. 2010. *Financial Protection of the State against Natural Disasters: A Primer*. World Bank Policy Research Working Paper 5429. World Bank, Washington, DC.
- G20 Global Infrastructure Hub. *PPP Risk Allocation Tool 2019*.
- International Monetary Fund. *Fiscal Risk Toolkit*.
- International Monetary Fund. 2016. *Analyzing and Managing Fiscal Risks—Best Practices*. Washington, DC.
- International Monetary Fund. 2018a. *Colombia: Fiscal Transparency Evaluation*. Washington, DC.
- International Monetary Fund. 2018b. *Fiscal Transparency Handbook*. Washington, DC.
- Irwin, T., S. Mazraani, and S. Saxena. 2018. *How to Control the Costs of Public-Private Partnerships. How to Notes*. International Monetary Fund, Washington, DC.

- Kunreuther, H. and E. Michel-Kerjan. 2013. Managing Catastrophic Risks through Redesigned Insurance: Challenges and Opportunities. In *Handbook of Insurance*, edited by G. Dionne. Place of publication: Publisher.
- Lu, J. Z., J. J. Chao, and J. R. Sheppard. 2019. *Government Guarantees for Mobilizing Private Investment in Infrastructure*. Washington, DC: World Bank.
- Organisation for Economic Co-operation and Development. 2015. *Guidelines on Corporate Governance of State-Owned Enterprises*. Paris.
- Organisation for Economic Co-operation and Development. 2020. *Transparency Frameworks for State-Owned Enterprises in Asia*. Paris.
- Organisation for Economic Co-operation and Development. 2021. *Ownership and Governance of State-owned Enterprises: A Compendium of National Practices*. Paris.
- Organisation for Economic Co-operation and Development and World Bank. 2019. *Fiscal Resilience to Natural Disasters: Lessons from Country Experiences*. Paris.
- Petrie, M. 2013. Managing Fiscal Risk. In *The International Handbook of Public Financial Management*, edited by R. Allen, R. Hemming, and B. Potter. London. Palgrave Macmillan.
- Saxena, S. 2017. *How to Strengthen the Management of Government Guarantees. How to Notes*. International Monetary Fund, Washington, DC.
- The Economist. 2022. *The World Enters a New Era: Bail-Outs for Everyone*. September 25.
- United Kingdom Office of Budget Responsibility. 2021. *UK Fiscal Risks Report 2021*. London.
- United Kingdom Treasury. 2017. *Contingent Liability Approval Framework, 2017*. London.

Chapter 7

Financing Options for Infrastructure Projects, with an Emphasis on Public-Private Partnerships

Ede Ijjasz

Abstract

Infrastructure needs in developing and emerging economies far outweigh the public sector's financial capacity. The private sector can bring efficiencies, innovation and capital to infrastructure services. The chapter (1) reviews the financial options and instruments available to national and subnational governments to attract private sector financing and operational expertise to infrastructure services and (2) explores public-private partnerships in detail, with attention to lessons from global experience.

7.1. Introduction

The chapter reviews financing options for infrastructure projects. Section 2 explores the differences between funding and financing in infrastructure and the possible role of the private sector. Section 3 presents an overview of private sector participation in infrastructure based on 2020 data. Section 4 discusses criteria and approaches to compare and prioritize ways the public sector can attract private financing to infrastructure projects. Section 5 describes a variety of financial instruments available to the public sector to mobilize private financing and mitigate risk, including those offered by capital markets, multilateral financial institutions (MFIs) and national development banks (NDBs).

Section 6 reviews public-private partnerships (PPPs) in greater detail and includes a discussion of myths and reality, basic definitions and concepts, the global situation and the quality of PPP design and implementation and other related topics. Section 7 provides a brief conclusion.

This chapter introduces infrastructure financing, focusing on PPPs. The topic is broad and complex. Box 7.2 provides a list of readings to expand the initial presentation made here. After reading this chapter, the e-handbook user should be able to answer the following questions:

1. What is the difference between funding and financing infrastructure, especially when the private sector is involved?
2. What are the recent trends in private sector participation in infrastructure in developing regions and emerging markets?
3. What factors should government consider when involving the private sector in infrastructure projects is an option?
4. What are the typical risks in infrastructure projects, and what risk mitigation instruments are available to attract the private sector?
5. How are PPPs structured, and what are the most important factors for their success?

While private sector engagement in infrastructure can take a wide range of forms—including simple forced account contracts, operation and maintenance contracts, delegated service or management contracts, different types of public-private partnerships (PPPs) and full privatization and sale of assets to private entities—this chapter focuses on PPPs and, to some extent, full privatization.

This chapter is a partial treatment of the topic and focuses on related key concepts and practical global experiences. The accompanying video recording and presentation materials for this e-handbook present additional topics and references; the reader is advised to review them. At the end of this chapter, an additional list of reading material is recommended.

7.2. Funding and Financing Infrastructure: Possible Role of the Private Sector

When the chapter was being written, most of the developing world faced declining fiscal resources and mounting debt levels. Some factors behind the challenges included the coronavirus (COVID-19) pandemic, the Ukraine crisis, inflation and a potential global recession. As multilateral and bilateral concessional funds are limited, the issue of whether and how to attract private resources to infrastructure projects is as important as ever.⁷⁷

Mobilizing resources for infrastructure investments involves two questions:

1. **How is infrastructure funded?** How is the cost of delivering the infrastructure service paid for, not only construction but also operation, maintenance, refurbishment and technological upgrades? The answer varies from country to country, from full cost recovery through user charges to fully financed by tax funding. Intermediate solutions such as tax-funded subsidies or innovative mechanisms such as land-value capture exist. But the final choice depends on each country's institutional, political and historical context.
2. **How is infrastructure financed?** Who pays for a project's phases, especially construction? The options range from fully private to fully public sources. A broad range of instruments can be used (central or local budgets, bond markets, bank loans and equity investment, among many others).

Funding is a cash-flow issue, which is generally an important challenge for infrastructure assets with a long life, as the revenues associated with the operation accrue over many years. Financing allows that future cash flow to be made available upfront to build infrastructure and support its operation and maintenance (O&M).

The potential involvement of private financiers in infrastructure depends on pricing decisions, regulatory frameworks, the level of cost recovery through user fees, the level of subsidies (when needed) and the project's cash-flow time profile.

Infrastructure projects require larger public subsidies when many consumers cannot afford the user fees needed for a full-cost recovery. The tension between financial viability and provision of services to the poor is the first fundamental challenge of infrastructure finance and private sector engagement in developing countries.

Better institutional environments—including reduced corruption, greater bureaucratic efficiency and higher regulatory capacity and quality—allow for higher levels of private finance without increasing the cost of financing. Research has shown that, by easing bankruptcy procedures, infrastructure projects can mobilize more private finance without raising prices for users.

⁷⁷ Section based on Fay et al. (2019)

The cost of public funds, the level of the public deficit and the efficiency of financial markets affect the preferred level of private financing in infrastructure. If a government has less budget pressure and a lower cost of taxation, then it may be more attractive to rely on tax transfers than user fees to keep service prices and levels of private finance low. More efficient financial markets make finance more sensitive to regulated prices.

Finally, the involvement of the private sector in the design, construction and O&M can lead to lower life-cycle project costs if the contract is prepared considering value-for-money approaches and includes incentives to optimize integrated costs across the useful asset life.

All those factors mean that the optimal level of private financing for infrastructure needs careful consideration. The question should be seen as something other than public or private sources. Policy reforms that improve the business environment make infrastructure projects more attractive to private financiers. At the same time, policy reforms that enhance the efficiency of the public sector in raising taxes and spending public resources are equally important. Moving forward on both fronts is beneficial for users and societies.

7.3. Private Participation in Infrastructure: The Situation in 2021

Private investment commitments in infrastructure projects in low- and middle-income countries in 2021 totaled USD76.2 billion across 240 projects.⁷⁸ After the economic crisis caused by the COVID-19 pandemic, private participation in infrastructure (PPI) increased by almost half from 2020. That year, PPI was only USD51 billion across 251 projects; 2021 saw increased total investment and a larger average size of infrastructure projects. Compared with the 2016-2020 average, however, PPI in 2021 was 12% lower, indicating some way to go before achieving full recovery and growth.⁷⁹

Over the last decade, the PPI trends have been generally downward from 2012, when more than 650 projects with PPI and close to USD180 billion in investments were committed, to 2020, when only 240 projects with PPI of USD76 billion in investments.

Recovery from the COVID-19 pandemic varied by region, led by East Asia, Latin America, Europe and Central Asia. But South Asia, the Middle East and North Africa saw a decrease from low levels of PPI in 2020. Sub-Saharan Africa remained stable from 2020 to 2021. However, PPI in Africa decreased from USD15 billion in 2012 to about USD5 billion in 2021.

Among sectors, transport bounced back from 2020 in all regions except the Middle East and North Africa. PPI in transport, USD43.8 billion, was larger than in energy,

⁷⁸ Data for the section come from the Private Participation in Infrastructure Database of the World Bank Group.

⁷⁹ Section based on World Bank (2022).

returning to historical trends from the last decade. Renewables dominate the PPI landscape in energy, with 95% of electricity generation projects or 72% of total energy investments.

In 2021, the proportion of brownfield infrastructure projects with private investments increased from USD5.1 billion in 2020 to USD12.4 billion due to more water projects. In 2021, 67 infrastructure projects with PPI (28%) had most of their stakes held by foreign investors, a decrease from 2020 (48%). Most of the projects were in energy. Most domestically sponsored projects were in China, with 60 projects, followed by Brazil and India.

7.4. Public Finance Support to Mobilize Private Capital for Infrastructure Projects

When the regulatory framework is unclear, or governments do not have a sufficiently long or credible track record in mobilizing private investment for infrastructure, countries must put forward government support mechanisms (including financial instruments) to attract private investment.⁸⁰

When a country lacks fiscal space (which is sometimes a reason to attract private investment), its government is likely to favor financial instruments that do not require immediate cash outlays, such as guarantees. However, the instruments are not cost-free. Chapter 6 of the handbook discusses the need to carefully monitor and manage contingent liabilities and avoid painful fiscal surprises. Governments have had to pay hundreds of millions of dollars for guarantees due to changes in exchange rates, lack of service demand and failure to raise tariffs, among others.

Therefore, governments must ask several questions in identifying and prioritizing fiscal support instruments for a project to attract private financing.

1. Is the project the right solution to the development challenge at hand?
2. What government objectives are to be achieved with fiscal support to the project?
3. Do the fiscal support instruments deal with government policies or public-good failures that could be resolved less cost-effectively by policy and institutional reforms?
4. What is the range of fiscal support instruments available to the government, and what are better tools needed for regulatory change to work?
5. How well does each instrument address the specific problems to be solved and the specific benefits to be achieved?
6. What is the likely cost of each fiscal support instrument?

⁸⁰ Section based on Irvin (2003).

Concerning the first question, the most common government objectives include the following:

1. Resolving market failures in financing infrastructure.
2. Providing infrastructure service access to the poor.
3. Internalizing externalities in infrastructure markets (for example, environmental pollution, exclusion of the poor, insufficient transparency in costs, among others).
4. Increasing efficiency in the expansion and provision of infrastructure services.
5. Increasing transparency in the quality and prices of services, allowing for fair charges and allocation of resources.

Instruments to support the engagement of the private sector in infrastructure range widely. They include, among others, (1) grants, (2) in-kind financial support (such as government land donations), (3) tax incentives, subsidies (for example, output- or outcome-based payments), (4) guarantees for risks under the government's control (regulations, tariffs) and those not under government control (foreign exchange rates, users' demand), (5) capital and/or equity contributions and (6) dedicated government-guaranteed bonds.

The choice among the instruments is complex. Government decisions are rarely driven solely by cost-benefit analyses. Good decision-making about fiscal support (tools and amounts) calls for strategic focus and prioritization. A team can do this only with the right information, skills and incentives. To achieve a balanced analysis, the team needs to include members responsible for the project's ultimate objective (services to the poor, economic growth and so on), those who understand and are accountable for the project costs and those who understand and have experience with fiscal support instruments and private-party engagement in the project. Finding and mobilizing that expertise is difficult, especially in the developing world.

Finally, that risks (real or perceived) are not the only barrier for private sector engagement in infrastructure must be emphasized. Private sector entities indicate that the lack of "bankable" projects is often an even bigger barrier. A bankable project has gone through the identification, preparation and appraisal process, including risk analysis and identification of guarantee mechanisms. A sufficient and predictable portfolio of projects is needed for the private sector to develop an interest in infrastructure opportunities and to invest in them. Many multilateral development banks have project preparation facilities (several financed by donor countries and managed by multilaterals) that help develop projects and, sometimes, a structured list of robust bankable projects.

7.5. Risk Mitigation Instruments

The section reviews risk mitigation instruments that government can provide—often with the support of multilateral development banks—to attract private sector financing to infrastructure projects.

Typical risks faced by infrastructure projects include the construction phase (unexpected geological conditions, cost and time overruns, mobilization of financial resources, commissioning, among others), the operation phase (demand below projections, higher operating costs, natural disasters, changing economic conditions affecting costs and revenues, labor, exchange rates, political changes, regulatory changes, among others), and the transfer or decommissioning phase (change in conditions, regulatory changes, among others). An effective risk distribution strategy assigns each risk to the party best qualified to absorb it.

Risk mitigation instruments are financial instruments that transfer a specific risk from the project financiers to guarantors and insurers that may be better positioned to handle the risk. When a government or public entity is not creditworthy enough to borrow debt from private parties or needs more of a track record to attract private partners to an infrastructure project, risk mitigation instruments can help.⁸¹

Risk mitigation instruments will not make a poorly structured project bankable. They will not make a public project sponsor with an unreliable track record (regulatory or contractual) attractive to potential private partners. The instruments can effectively support only well-designed projects and institutions with a good reputation and a sound governance framework.

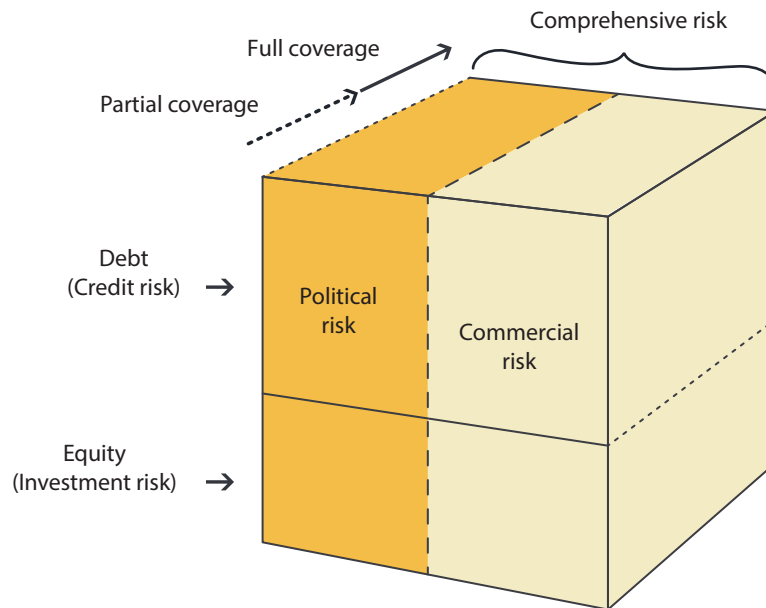
Risk mitigation instruments can help all parties. Private parties can expand their areas of engagement to markets with perceived risk levels higher than they can handle. State-owned enterprises in developing countries can tap into domestic and international private capital for infrastructure projects. MFIs can leverage their capital instead of using loans or grants to finance infrastructure projects directly. And governments can enhance their ratings as guarantors for infrastructure projects, thereby reducing their financing costs.

Infrastructure projects and their sponsors face many risks, most of which can be covered by risk mitigation instruments. Risks include construction risks (typically cost overruns and delays), operating risks (operating cost overruns, insufficient demand or revenue underperformance), regulatory and legal risks and macroeconomic and foreign exchange risks.

Risk mitigation instruments can be classified along three key dimensions (Figure 7.1):

1. They cover either credit risk (debt) or investment risk (equity).
2. Some risk mitigation instruments distinguish the cause of the debt default or investment loss as **political** or **commercial** risk.
3. The device can provide full coverage (usually for debt) or partial coverage (to promote risk sharing with the lender or equity investor).

⁸¹ Based on Matsukawa and Habeck (2007).

Figure 7.1. Classification of Risk Mitigation Instruments along Three Key Dimensions

Source: Matsukawa and Habeck (2007).

The most common guarantees are full credit, partial credit, and political risk guarantees:

Credit guarantees cover losses in the event of a debt service default. They generally cover political **and** commercial risks. Full credit or wrap guarantees cover the full debt service in case of a default. Bond issuers use the guarantees to get a higher credit rating in the market.

Partial credit guarantees (PCGs) only cover a portion of the debt service. Governments or public entities use PCGs to access the international financial market or to issue bonds internationally. Subnational governments and entities (such as municipal utilities) use PCGs to borrow domestically from commercial banks or issue bonds in the domestic capital market. The enormous difficulties subnational entities encounter when mobilizing private finance for infrastructure require such instruments. MFIs generally offer PCGs.

Political risk guarantees (PRGs) are also called political risk insurance (PRI), depending on the provider. PRG can cover commercial lenders for the full debt when political risks materialize and cause a debt default. For equity investors, PRI and PRG cover different political risks. PRI usually covers currency inconvertibility, foreign currency transfer restrictions, expropriation, war and civil disturbance. PRG can cover those risks plus changes in laws and regulations, changes in tariff adjustment regime or noncompliance with tariff increases and unfulfilled government payment obligations, such as agreed subsidy payments. Other risks covered by PRG include nonpayment by public entities (for example, offtake agreements with state-owned entities) and some uninsurable force-majeure events.

When the regulatory framework is too weak, infrastructure projects are regulated

by contract, meaning that many of the standard regulations a private project sponsor would expect to see are included in the contract. PRGs sometimes cover the government's contractual obligations.

PRG or PRI may cover two additional risks: devaluation and subsovereign risk. Private project sponsors will need a devaluation risk guarantee in countries without credible market-based currency hedge products and with a high risk of currency devaluation. The guarantee is essential when the contract does not include tariff foreign exchange rate indexation for components incurred in foreign currency.

In many countries, the risk of subsovereign entities or local governments (e.g., provinces or municipalities) differs from sovereign risk. Many infrastructure projects are developed at the subsovereign level (state roads, water infrastructure, power generation for subsovereign entities). Some MFIs provide loan guarantees and PCGs to subsovereign entities based on their own credit risk. In some cases, the national government must provide a guarantee to lift the subsovereign risk rating to the sovereign level, connecting the PRG to the national government.

7.6. Multilateral Finance Institutions and National Development Bank Instruments to Support Infrastructure Projects

7.6.1. Multilateral financial institutions and their instruments

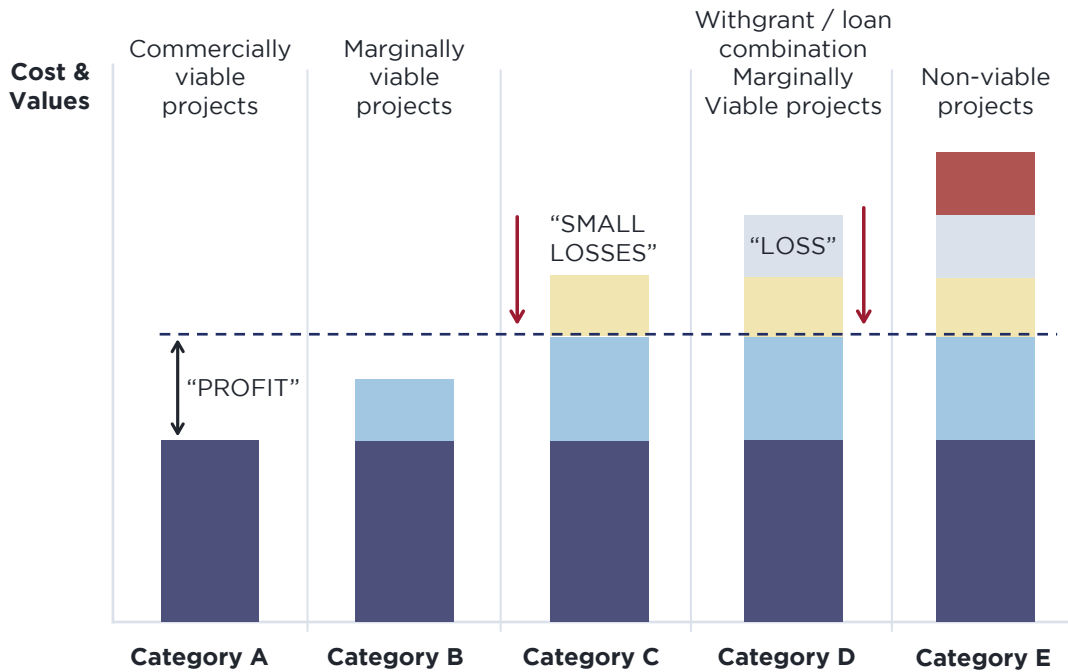
MFIs have instruments that are ideal for infrastructure financing. Their loans and credits have long tenures and are provided at a relatively low cost as the institutions have extremely high credit ratings that are passed on to borrowers.⁸² MFIs have a variety of risk mitigation instruments (section 5). Recently, MFIs have expanded the range of instruments that mobilize grant funding for blended finance, particularly for climate change investments.

Infrastructure projects in developing countries can be categorized into five (Figure 7.2):

- a. Viable and profitable projects that attract private financing (e.g., telecoms).
- b. Viable projects with profits below expectations (especially considering the country's risk profile).
- c. Projects close to a breakeven point that can become viable with a soft subsidy (e.g., lower-cost financing from a development bank).
- d. Projects beyond the breakeven point that require a much higher subsidy (grants and/or other financial instruments) to become viable.
- e. Projects too far from the breakeven point that require full (or almost full grant) financing.

⁸² Based on Griffith-Jones and Kollatz (2015).

Figure 7.2. Typology of Infrastructure Projects, Costs Compared with (Market) Values



Source: Griffith-Jones and Kollatz (2015).

Among the MFIs, the World Bank and major regional institutions focus on categories B-E. For category E, they mobilize grants from bilaterals or institutions such as the Global Environmental Facility of the Green Climate Fund. This allows them to provide blended finance to attract private sector investments in new sectors with global benefits. Other multilateral institutions (for example, the Latin-American Development Bank [CAF], the European Investment Bank [EIB] or the Asian Infrastructure Investment Bank [AIIB]) focus on categories B-D. Organizations focused on supporting the private sector, such as the IFC or the EBRD, work on categories B, and, when grant funding is available, C.

MFI financing is significant during the construction of infrastructure projects when all parties face numerous uncertainties. The financing is critical for the final stages of infrastructure projects with a long asset life and revenue streams requiring extremely long maturities that are difficult to fund through the traditional private sector before the project is built and fully operational.

Other areas where MFIs play a vital role include support to develop project pipelines, pre-investment and project preparation, technical assistance to strengthen national institutions' regulatory framework and capacity and coordination across countries in regional projects. The MFIs' role has been a major stumbling block for private sector participation in infrastructure and one repeatedly highlighted by private sector stakeholders.

Many project preparation facilities provide support to build the capacity and strengthen the regulatory frameworks of developing countries to attract the private sector to infrastructure projects by reducing uncertainties and risks. Finally, MFIs

provide coordination services in regional infrastructure projects: for example, by developing regional power pools, making infrastructure regulations compatible across countries and facilitating agreements across borders, as the participating countries are members of those institutions.

All the above support areas create a “halo effect” when an MFI is engaged in an infrastructure project. The credibility of the project and the agency in charge receive a bump when an MFI participates through loans, equity, guarantees and/or technical assistance.

7.6.2. National development banks and their instruments

NDBs or national infrastructure banks (NIBs) are government-owned or -sponsored institutions used over the last half-century to support infrastructure development programs. From the German KfW and the Brazilian BNDES established in the 1940s and 1950s to the more recent Canada Infrastructure Bank or the Indian National Investment and Infrastructure Fund established in the 2010s, the institutions play a vital role in the national and subnational financing of infrastructure.⁸³

The original mandate of NDBs and NIBs was to raise capital efficiently to support infrastructure provision. Gradually, many of them saw their mandates evolve to mobilizing private financing. More recently, new institutions or mandates have been established to support green infrastructure, national climate action plans or net zero commitments.

Historically, NDBs and NIBs raise low-cost capital in the local market using significant sovereign backing, either as paid-in or callable capital, and explicit or implicit credit guarantees by the national government. NIBs with a strong balance sheet have been able to issue uncovered bonds, relying on their own credit ratings and credibility. Others have engaged in secondary financing by securitizing some of their assets under operation.

NIBs play a key role in bringing local institutional investors to the infrastructure space through NIB bonds or equity funds managed by NDBs. Doing so is essential in mobilizing local currency financing for infrastructure (see section 5.2). In such cases, NIBs must limit their financial intervention to project development and construction. Their role is crucial and opens the door for more private and institutional capital interested in operational assets.

Many NDBs and NIBs have expanded their services to expertise in infrastructure finance, PPP structuring or overall project structuring, helping alleviate development bottlenecks and build a solid pipeline of bankable projects. A few NIBs are exploring partial credit guarantees or more targeted and transparent subsidy regimes.

A common question for NDBs and NIBs is how to avoid crowding out the private sector in the infrastructure financing space. Global lessons from experience show the institutions must focus on additionality in every transaction, establish a strategy and mandate with clear objectives and approved by the central government and have

⁸³ Based on World Bank (2018a)

an independent management structure that is judged against the implementation of the strategy and mandate. Governments and entities providing the infrastructure services must have a well-defined policy and practice on subsidy provision so that resources (implicit or explicit) are targeted, catalytic, and as transparent as possible (while keeping commercially sensitive information confidential).

Finally, the mandate of some NIBs is evolving to green infrastructure financing, with a strong emphasis on renewable energy and other climate-smart technologies. Some countries are establishing new institutions with that sole focus. In those cases, the institutions focus on financing greenfield projects, particularly in the initial phases where innovative technologies need at-scale demonstration. The institutions refinance existing green portfolios by issuing green and other sustainability bonds. Recent experience indicates that early success factors include the need for highly specialized in-house expertise, a strong focus on emerging technologies to demonstrate viability at a scale that will encourage private financing in subsequent projects and flexibility to invest across the capital spectrum to respond to specific project needs.

Box 7.1. Capital Markets and Infrastructure Financing

Traditional funding sources such as governments, private investors, commercial banks and development finance institutions cannot fully meet the demand for infrastructure projects with private involvement. Infrastructure assets have long tenors and predictable cash flows, so they are a good match for the type of assets that pension funds, retirement plans and life insurance companies prefer. Therefore, there is an opportunity to bring those institutional investors into financing infrastructure projects.

However, institutional investors face challenges in financing infrastructure, including insufficient “bankable” projects and a lack of scale for efficient asset groups with long tenures. Other challenges include the lack of developed local capital markets, small or nonexistent government bond markets that can serve as a benchmark for pricing, small domestic institutional investors and the lack of currency swap markets needed by foreign institutional investors. These challenges have presented a significant barrier, and few emerging market economies have developed frameworks for capital market instruments. The liquidity in the banking sector for infrastructure projects has been adequate in these markets for current private sector engagement opportunities in infrastructure. As a result, the need to rely on capital markets has not been urgent.

Source: World Bank. 2017. Promoting the Use of Capital Markets for Infrastructure Financing. Washington, DC.

7.7. Public-Private Partnerships

The PPP is one of the most common arrangements to engage the private sector in infrastructure projects. Risk mitigation instruments, financial instruments and institutions that attract the private sector to infrastructure projects support PPPs. The section discusses the myths surrounding PPPs, presents basic definitions and terms, reviews PPP frameworks and their performance worldwide and covers other related topics.

7.7.1. Public-private partnership myths

Many myths surround PPPs. The most common ones are contrasted here with operational experience in recent decades.⁸⁴

Myth 1. PPPs are a recent invention. Many telecommunication, railroad, electricity and municipal gas companies and some inland waterway canals were originally private or PPPs in England or the United States. Many were financed with bonds issued by private developers.

Myth 2. PPPs are a simple solution to the lack of fiscal space. A common problem of many state owned infrastructure providers is that they end up in low-level equilibrium of a low-quality service provision and low profitability due to insufficient tariffs and collection. Low-level equilibrium hides the full cost of the service. Some hidden corners include household self-provision, economic costs due to inefficiency, untargeted subsidies and leakage. Unless such issues are resolved, a PPP cannot mobilize funding and, thus, cannot substitute for public funding.

Myth 3. PPPs are an easy solution to the government's fiscal risk. For a PPP in a problematic sector to be viable, the government (through taxpayers) needs to contribute or, more commonly, give guarantees. Guarantees are generally not counted as government debt and have different approval processes. Contingent liabilities are often realized, and the initial government's fiscal troubles are amplified down the road (see chapter 6).

Myth 4. PPPs bring significant amounts of fresh capital that can resolve fiscal gaps. The project investor goes to the market to raise debt for PPPs that rely on user fees. If the public and the market trust the government and its infrastructure agencies, they can raise the same level of resources or even more.⁸⁵

Myth 5. PPPs always perform better than government projects. While many PPPs do perform better, the difference is only partially related to contract structures. Instead, the critical difference resides in the incentives of the private company to monitor contract performance and fulfillment because the company's private shareholders and lenders bear performance risk; their money is on the line.

A PPP contract's performance depends on government regulation and oversight quality, especially for monopoly services. The dual objectives are price (not too high or low) and quality (sound and safe). Private contractors can be pushed to become highly efficient in infrastructure services, where quality can be measured clearly and independently (which is the case for most services if the contract is designed well).

Myth 6. PPPs have lower corruption levels. Levels depend more on the country's overall governance.

⁸⁴ The section is based on Klein (2015)

⁸⁵ The level of investments in infrastructure PPPs has varied greatly during the last decade, as high as close to USD120 billion in 2012, and as low as USD51 billion in 2022. These variations can be explained by global crisis (pandemic in 2022) and difficult economic conditions in large middle-income countries, such as Brazil or Türkiye, that have relied on PPPs for infrastructure investments in several sectors (World Bank, 2022).

7.7.2. Public-private partnership: the basics

The subsection reviews some key PPP definitions and concepts. It describes PPPs and their key elements: types, payments and organizational structure, key factors to provide value for money to users and society, and a typical project structure and flow of funds.⁸⁶ The subsection shows why governments should fiscally support PPPs, briefly introduces the components of a comprehensive PPP framework, outlines the typical steps in a PPP process, describes PPP units and presents the unique challenges of municipal and subnational PPPs.

A PPP is a long-term contract whereby a private party provides a public asset or service and bears the related risks in exchange for government remuneration linked to performance.⁸⁷ Each feature is important in designing a PPP.

A PPP should include five elements.

1. A long-term contract (the PPP contract) between a public contracting authority and a private sector company (the project company) for public service delivery.
2. Transparent allocation of specific risks to the project company. Some typically include asset design, build and operation.
3. A contract and payments based on well-defined service outputs rather than inputs (as would be the case for a traditional construction contract).
4. A proportional contribution of private financing linked to risks transferred to the private sector.
5. Payments to the project company based on performance and linked to the level and quality of infrastructure services delivered.

PPPs can be used for greenfield or brownfield projects. The private project company is generally responsible for the design, building or rehabilitation, financing and O&M of the infrastructure assets and related services.

PPPs can establish a user-pays approach, a government-pays approach or a combination of both. Regardless, remuneration should be linked to performance (quantity and quality of services).

The private party typically creates a PPP company—a special purpose vehicle—that allows segregating all assets and liabilities linked to the private provision of services.

PPP contracts are of several types:

1. Design-build-finance-operate maintain (DBFOM), design-build-finance-operate (DBFO), design-construct-manage-finance (DCMF).

⁸⁶ Subsection is based on World Bank (2017b).

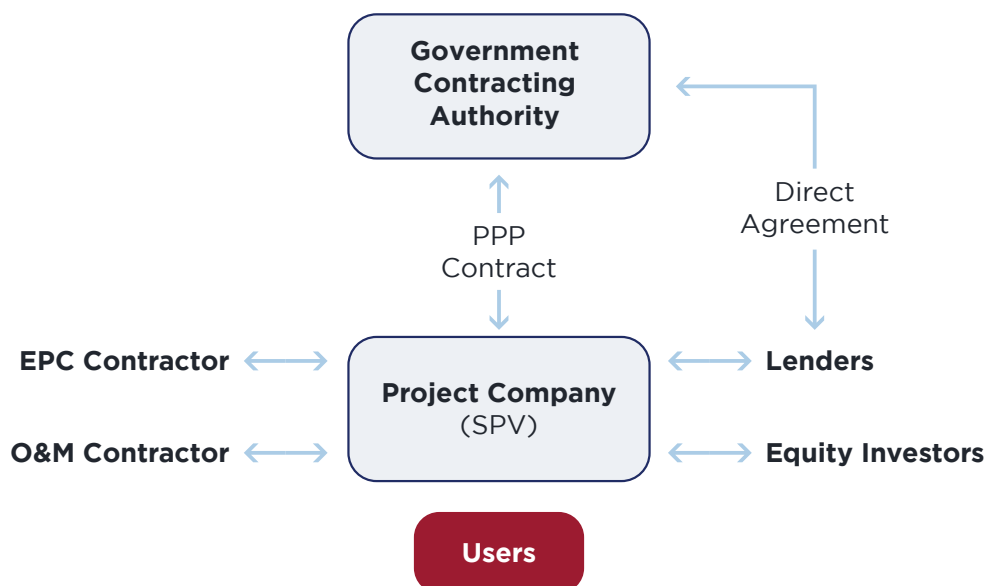
⁸⁷ In very few cases, PPPs are implemented with State-Owned Enterprises (SOEs) that work in a commercial, independent manner. For example, PPPs in China are defined as a partnership between the government and societal capital, including SOEs. More than two-thirds of PPP contractors among national demonstration projects, more than two-thirds were SOEs, according to the China Ministry of Finance. The stability of SOEs, their large capacity, and access to capital have made them attractive partners to local governments (Tan and Yao, 2019).

2. Build-operate-transfer (BOT), build-own-operate-transfer (BOOT), build-transfer-operate (BTO).
3. Rehabilitate-operate-transfer (ROT).
4. Concession.
5. O&M.
6. Franchise.

Other contracts for constructing or operating infrastructure assets are not considered full PPPs, including *affermage*⁸⁸ or management contracts, leasing or turnkey contracts.

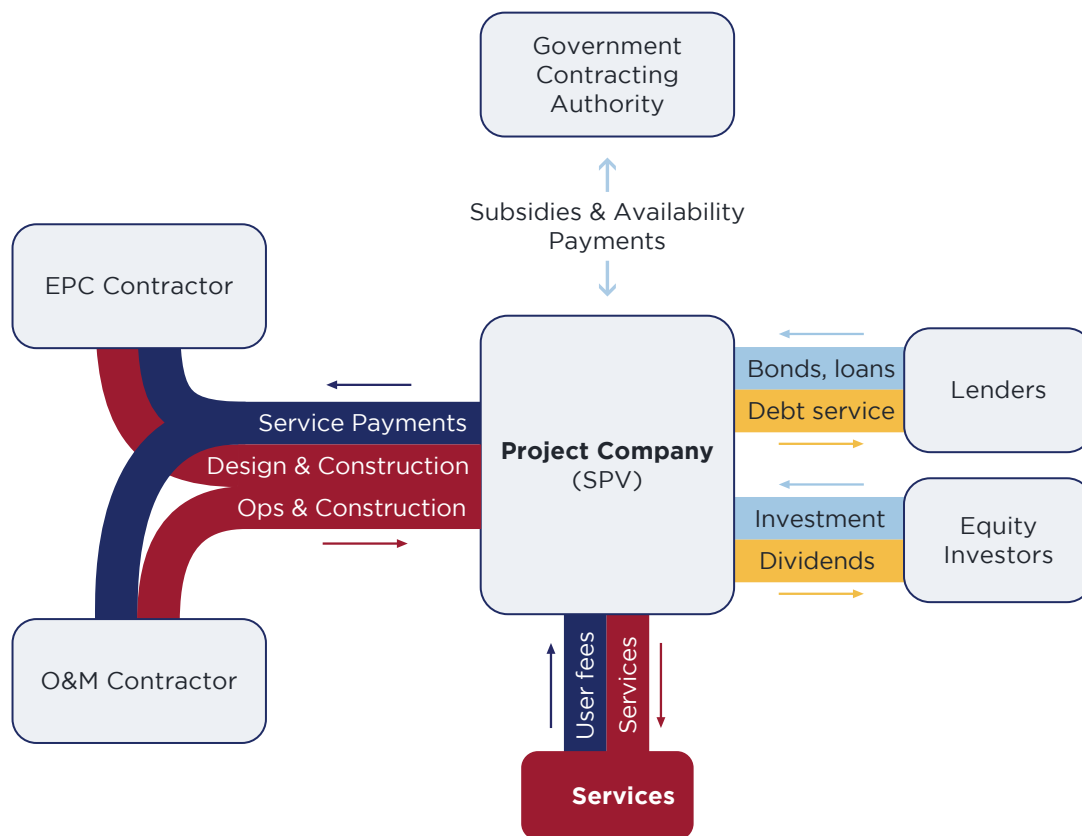
In well-designed PPP contracts, the value to users and society is based on various factors, including their whole-of-life approach to the design and cost of infrastructure assets, clear risk transfer to the private party and well-defined commitment to maintenance and quality of services. PPP contracts strongly focus on service delivery; they push for innovation by the private party and ensure optimized use of the assets. Finally, PPPs mobilize additional funding unavailable to the government or the public agency on the same terms and tend to have strong accountability and transparency. Figures 7.3 and 7.4 present a typical PPP project structure and flow of funds.

Figure 7.3. Typical Project Structure



EPC = Engineering, procurement, and construction; O&M = operation and maintenance; SPV = special purpose vehicle.
 Source: World Bank (2017b).

88 In an *affermage* arrangement, the private company bills and collects users' tariffs. Payment to the private company is based on an agreed-upon proportion of the tariff. Usually, the difference between the tariff and the price paid to the private company is used by governments to pay for past and future capital investments.

Figure 7.4. Typical Flow of Funds

EPC = engineering, procurement and construction; O&M = operation and maintenance; SPV = special purpose vehicle.
 Source: World Bank (2017b).

The government may consider contributing public finance to a PPP for several reasons: (1) reduce excessive risk premiums charged by the private company, (2) reduce the cost of finance for the project and (3) mitigate government risk. The government can contribute to the PPP in diverse ways (sections 4 and 5.1), including through a direct loan or grant finance to the project company, a government guarantee on a commercial loan to the project company, involvement of a government-owned development or infrastructure bank or even (although rarely) retention of responsibility for full capital expenditures of the project to benefit from more advantageous financing terms to the government.

International experience identifies seven elements of good governance in PPPs: efficiency, accountability, transparency, decency (development and application of rules that do not harm people or communities), fairness and participation of all stakeholders.

Section 7.3 covers in more detail the PPP regulatory framework. This brief introduction presents the components of a comprehensive PPP framework:

1. Policy.
2. Legal framework—the laws and regulations underpinning the PPP—enabling the

government to enter into PPPs and defining the rules of implementation for PPPs.

3. Processes and institutional responsibilities: the steps by which PPP projects are identified, developed, appraised, implemented and managed, and the roles different entities play in each step.
4. Public financial management approach: how fiscal commitments under PPPs are controlled, reported and budgeted for, including financial and fiscal risks management.
5. Other arrangements: the role of other entities, such as auditing entities, the legislature and the public in the PPP program.

The typical PPP process can have six steps:

1. Identify priority projects, ideally as part of a national or subnational infrastructure project and service planning process.
2. Screen the priority project list to identify projects with PPP potential.
3. Develop and prepare the projects. This includes a detailed list of the projects that will be prepared as PPPs, including their structure and appraisal. Identify the risks and responsibilities, appraise the project's technical feasibility and commercial viability and evaluate the value-for-money of the PPP approach.
4. Draft a PPP contract once the above analyses determine that a PPP approach passes the various criteria. Define the performance requirements and payment mechanisms, establish dispute resolution and contract adjustment procedures and design procedures for contract termination.
5. Manage the PPP transaction, which requires deciding the procurement strategy, qualifying bidders, managing the transparent bid process, reaching financial closure with the preferred private party and signing the contract.
6. Manage the PPP contract, including setting up contract management structures, monitoring and managing PPP delivery and dealing with changing circumstances during the contract period.

Many governments concentrate PPP skills in special teams to support the steps, often called PPP units. The units have a wide range of options, which vary from country to country. PPP units can be responsible for a variety of tasks, including the following:

1. Providing policy guidance and capacity building, including defining PPP policies and processes.
2. Supporting capacity-building efforts of implementing agencies undertaking PPP transactions.
3. Preparing guidance materials and standard documentation for PPPs to facilitate the process at the national and subnational levels.

Other PPP units give technical support, such as offering hand-holding to line agencies undertaking PPPs or bearing responsibility for some aspects of PPP implementation, such as structuring transactions or compiling potential project pipelines for review.

Finally, PPP units with a higher level of authority are tasked to review or oversee the management of PPP projects for efficiency and affordability and, at times, approve PPP projects or advise on the approval process.

7.7.3. Public-private partnership

The subsection presents key messages from a World Bank assessment of PPP frameworks.⁸⁹ Not surprisingly, the study found that the higher the group's income level, the higher the PPP framework's performance. However, regardless of income level, the weakest areas in the PPP framework are preparation and contract management. Performance among developing regions varies from high in Latin America, to low in sub-Saharan Africa and East Asia. Most Organisation for Economic Co-operation and Development high-income countries regulate PPPs as part of their general procurement law. Eastern Europe and Latin America have the largest proportion of economies adopting stand-alone PPP laws.

PPP units are prevalent; 84% of countries have a dedicated one primarily to promote and facilitate PPPs. Only in 7% of countries does the PPP unit play a prominent role in developing PPPs and act as the primary (or exclusive) procuring authority.

The fiscal implications of large PPPs are significant. However, while 72 percent of countries give a gatekeeping role to the Ministry of Finance, only about a third have adopted specific provisions for budgeting and reporting.

A key message of the chapter is that PPP projects must be soundly appraised. However, the study found that only half of the countries surveyed have specific methodologies for risk analysis, fiscal affordability, value for money, and other key elements of PPP appraisal.

Although contract renegotiation is likely to occur in long-term PPP contracts, only 47 of countries surveyed for the report have introduced a third-party approval requirement for modification of PPP contracts. This approach is very important to avoid opportunistic behavior by the private party. Another useful mechanism is to define minimum thresholds for modifications above which a new tendering process is mandatory. However, this good practice is used only in 40 percent of the countries surveyed.

7.7.4. Other public-private partnership topics

The final subsection reviews the global experience in unsolicited proposals, the relationship between country and PPP risk, and the disclosure of PPP information.

Unsolicited proposals are commonly discussed in PPP frameworks (World Bank, 2018b). About 57% of countries explicitly allow them, 3% prohibit them and 10% do not regulate them. However, they still occur (20% in East Asia).

Unsolicited proposals have some advantages. For example, they may allow governments to rapidly identify and prioritize projects and generate innovative solutions to infrastructure challenges. A well-defined process can speed up the

⁸⁹ Subsection is based on World Bank (2020).

process and harness the private sector's innovation by accepting unsolicited proposals to enable private entities to propose project ideas that align with the government's infrastructure plan.

If governments do not have sufficient financial or technical resources to complete feasibility studies for an infrastructure project, a well-designed unsolicited proposal process can require the proposal proponent to include the studies in the proposal submission. In that case, governments need to have the capacity to evaluate the quality of the studies and their technical and commercial viability.

Finally, unsolicited proposals can expand the range of technological solutions the private sector proposes more than traditional processes can, with technologies predefined by the public sector in the bidding documents.

However, unsolicited proposals have many disadvantages and risks that governments and line agencies need to understand fully:

1. As the government takes several risks in most PPPs, it must critically look at the risk assessment of unsolicited proposals, which is generally too optimistic.
2. As the private sector puts them forward outside regular government planning processes, unsolicited proposals may sometimes not fit or even contradict infrastructure sector plans.
3. Many uncoordinated unsolicited proposals may divert government attention from a planned approach to infrastructure development.
4. Negotiating an unsolicited proposal with the project proponent without a transparent or competitive procurement process can be difficult.

Country and public-private partnership risk. A global study (World Bank, 2013) on the effects of country sovereign risk rating on PPI (most of which occurs through PPPs) found that PPI is highly sensitive to sovereign risk. On average, a developing country's risk rating is a reliable predictor of PPI levels. Therefore, individual investment policies, such as using guarantees, offtake agreements and other credit enhancements, are critical.

The global study found that concessions are more sensitive than greenfield projects to country risk. Most concessions include brownfield projects. Greenfield investments, however, often shield investors from economic and commercial risks that are part of sovereign risk, such as fluctuating demand (driven by changes in economic activity) and currency depreciation.

PPP information disclosure. Most countries follow good international practices in disclosing information to the public in the procurement phase (World Bank, 2017a) but not during preparation and contract management.

Good practice calls for making performance information available to the public as it increases all stakeholders' accountability and is crucial to promoting transparency. However, only 13% of countries allow public access to the system for tracking progress and completion of construction works under a PPP contract, only 10% have an online platform for that purpose and only 14% allow the public to track contract performance through a designated online platform or by posting the updated documentation online.

As PPPs have been politically contentious at times, considering disclosure carefully is essential. Some areas or elements of the PPP contract are confidential (subject to overarching law and project-specific circumstances): for example, where the private provider's competitiveness may be jeopardized, such as the base case financial model, debt structure and pricing methodology and components.

Other dimensions of the PPP contract and process can be disclosed. Good international practice recommends some typical documents for disclosure (see World Bank [2017a]) at different stages. For example, before procurement, disclosing the following is recommended: (1) the approved pipeline of projects for PPPs, (2) the request for proposal and related documents, (3) the names of bidders and the shortlist of any oversight reports available and (4) value-for-money reports.

After procurement is completed, disclosing the following is recommended: (1) high-level project information, (2) risks (allocation and mitigation), (3) high-level financial information (structure, revenues, forecasts), (4) government support (guarantees, grants, service subsidies, etc.), (5) tariffs (methodology and review), (6) contract performance, (7) contract termination (reasons and handover provisions) and (8) any contract renegotiations and changes.

Dealing with change. Over the 10 to 30 years of the typical life of a PPP investments, changes will take place and disputes between the parties will arise. It is important to have clear adjustment mechanisms in the PPP contract. The PPP contract managers need to be well prepared early on with those mechanisms, such as having panel of experts in place.

Many PPP contracts are renegotiated, meaning that some of the contractual provisions are modified beyond what was envisioned in the adjustment mechanisms. It is advisable to avoid renegotiations. Sometimes renegotiations are the result of weaknesses in the contract or the procurement process. A review of 1,000 concessions in Latin America and the Caribbean between 1985 and 2000 found that 75 percent of water concessions and 55 percent of transport concessions were renegotiated, on average only 2.2 years after contract signing (Guasch 2004).

Another eventuality that must be included in the PPP contract is the procedures and provisions for early termination of the project by the contracting authority. These situations should be defined clearly and the breach of contract conditions should be fundamental. Compensations to either party should be clearly stated in the PPP contract.

Given the serious consequences of early termination, it is important for the parties to find practical solutions quickly, either through formal or informal channels. Political interferences and popular pressure have caused major PPP contracts to be canceled, like the Buenos Aires water concession terminated in 2006 due to complaints on performance and a freezing of water tariffs after the 2001 economic crisis. Arbitration tribunals like the International Center for the Settlement of Investment Disputes (ICSID) are expensive and lengthy processes. Having teams with the right skills and level of authority negotiating the dispute before it escalates to higher levels is a key factor of success in avoiding early termination.

7.8. Conclusion

The infrastructure service gap in most developing countries needs to close faster; in many cases, the gap is increasing because of rapid urbanization and population growth. Governments' fiscal space is limited, especially after the economic impacts of the COVID-19 pandemic and the food, fuel, fertilizer and debt crises triggered partly by the war in Ukraine. Governments want the private sector to engage financially and operationally in infrastructure services projects.

To attract the private sector, governments must carefully analyze the following:

1. Core objectives of infrastructure service improvements.
2. Use of fiscal support to the private sector and risk mitigation instruments.
3. The best ways to leverage institutions such as multilateral and national development banks.

PPPs, the most common approach to engage the private sector in infrastructure services, need well-designed frameworks, effective information disclosure mechanisms and effective supervision and contract renegotiation mechanisms to deliver services successfully.

The chapter reviewed the recent trends, challenges and opportunities of private sector participation in infrastructure. It reviewed the questions that governments need to answer to attract the private sector, including through risk mitigation instruments. Finally, the chapter reviewed the most critical factors in designing, regulating, overseeing and financing private-public partnerships for infrastructure projects. Interested readers may refer to the publications listed in the Table, which delve deeper into discussions and examples on the topics presented here.

Box 7.2. Additional Readings

Inter-American Development Bank. 2021. IDB Climate-Resilient Public Private Partnerships. Washington, DC.

Organisation for Economic Co-operation and Development. 2012. Recommendation of the Council on Principles for Public Governance of Public-Private Partnerships. Paris.

Organisation for Economic Co-operation and Development. 2017. Public-Private Partnerships Reference Guide. Paris.

World Bank and International Monetary Fund. 2016. Public-Private Partnership Fiscal Risk Assessment Model. Washington, DC.

World Bank and International Monetary Fund. 2017. Public-Private Partnerships Fiscal Risk Assessment Model (PFRAM): Version 2.0.

World Bank. 2016. Country PPP-Readiness Diagnostic Tool. Washington, DC.

World Bank. 2018. Policy Guidelines for Managing Unsolicited Proposals in Infrastructure Projects. Washington, DC.

World Bank. 2021. PPP Project Screening and Analytics Tool (PSAT) User Guide. Washington, DC.

World Bank. 2022. Guidance on PPP Legal Frameworks. Washington, DC.

World Bank. 2022. Infrastructure Prioritization Framework (IPF).

World Bank. 2022. Municipal Public-Private Partnership Framework. Washington, DC.

World Bank. Public-Private Partnership Legal Resource Center.

References

- Fay, M. et al. 2019. Funding and Financing Infrastructure: The Joint-Use of Public and Private Finance. Policy Research Working Paper 8496. World Bank, Washington, DC.
- Griffith-Jones, S. and Kollatz, M. 2015. Infrastructure Finance in the Developing World—Multilateral Lending Instruments for Infrastructure Financing. Seoul: Global Green Growth Institute.
- Guasch, J. 2004. Granting and Renegotiating Infrastructure Concessions: Doing it right. Washington, DC: World Bank.
- Irvin, T. 2003. Public Money for Private Infrastructure Deciding When to Offer Guarantees, Output-Based Subsidies, and Other Fiscal Support. Working Paper 10. World Bank, Washington, DC.
- Klein, M. 2015. Public-Private Partnerships Promise and Hype. Policy Research Working Paper 7340. World Bank, Washington, DC.
- Marcelo, D. et al. 2017. Do Countries Learn from Experience in Infrastructure PPP? Working Paper 8054. World Bank, Washington, DC.
- Matsukawa, T. and Habeck, O. 2007. Review of Risk Mitigation Instruments for Infrastructure Financing and Recent Trends and Developments. Trends and Policy Options 4. Public-Private Infrastructure Advisory Facility, World Bank, Washington DC.
- Tan, J. and Zhao, J.Z. (2019). The Rise of Public-Private Partnerships in China: An Effective Financing Approach for Infrastructure Investment? *Public Admin Rev*, 79: 514-518.
- World Bank. 2013. The Effects of Country Risk and Conflict on Infrastructure PPPs. Working Paper 6569. Washington, DC.
- World Bank. 2017a. A Framework for Disclosure in Public-Private Partnerships. Washington, DC.
- World Bank. 2017b. Public-Private Partnerships Reference Guide. V. 3.0. Washington, DC.
- World Bank. 2018a. Guidance Note on National Infrastructure Banks & Similar Facilities. Washington, DC.
- World Bank. 2018b. Procuring Infrastructure Public-Private Partnerships Report. Washington, DC.
- World Bank. 2020. Benchmarking Infrastructure Development. Washington, DC.
- World Bank. 2022. Private Participation in Infrastructure (PPI) 2021 Annual Report. Washington, DC.

Chapter 8

Legal Aspects of External Debt and Lending

Kanyi Lui and Tomas Magnusson

Abstract

The chapter focuses on the central government (the sovereign) as borrower and has two parts. The first (Sections 1 to 6) covers the legal framework for sound debt management, including examples of drafts of key areas of public debt management law. Other issues discussed are the layers of decision-making bodies in a central government that make it difficult for a lender to determine that borrowing has been duly and legally authorized. The chapter covers negative pledge and *pari passu* covenants commonly found in external loan contracts and any legal defense the government can raise to stop servicing the debt.

The second part (Section 7) focuses on issues lenders should consider when lending to a sovereign and covers the process from the initial to execution and post-loan phases. Assuming that commercial lenders have a duty to do all they can to ensure the borrower repays them, the second part includes many examples of how credit risk can be mitigated through documentation and credit enhancement.

8.1. Evolution of the Legal Framework for Public Debt Management

The legendary Alfred P. Sloan, Jr. (1963), who built up General Motors, had “gone back again and again to the American Constitution to develop management organization and management concepts for General Motors and for the large corporation altogether.”⁹⁰

In the 1980s, it was the other way around. The effectiveness of the private sector inspired central governments to reach their goals.⁹¹ Historically, sovereign debt⁹² management was inefficient. Commonly, several units borrowed funds on behalf of the government. Consequently, several debt databases existed without systematic cost and risk analysis of the total debt portfolio. The legal framework was limited to borrowing authorization.

As a more recent example, in Kenya in 2003, debt management functions were scattered among several departments of the Ministry of Finance and the Central Bank of Kenya. The bank performed front-office functions for domestic borrowing, and the External Resources Department of the Ministry of Finance took care of external borrowing. The role of the Debt Management Department was restricted to calculating the grant element in external borrowings. Debt recordings were not complete.

During the 1980s, inspired by the private sector, a new approach to public management, in general, emerged that focused on performance and evaluation. The approach included clear roles and responsibilities for different entities, measurable outputs and outcomes, arms-length government agencies to reduce political interference in daily operations, enhanced accountability of the cabinet to the assembly or parliament, emphasis on efficiency, effectiveness and economy, and independent auditors.

In 1997, two former International Monetary Fund (IMF) staffers expressed the predominant view of the economics profession:

The most pressing issue confronting governments is the need to reform the institutional arrangements governing debt policy, so that the technical expertise and experience required to manage the risks of external debt competently and transparently can be applied. Professionalism and accountability can best be achieved when debt management is assigned to an agency that is separate and autonomous from the political process. Within this framework, the ministry of finance formulates and makes public the strategy for debt management while the debt office implements the strategy and manages the daily risk exposure of the sovereign portfolio. This type of arrangement signals to the financial markets and the general public a country’s commitment to a transparent and accountable debt-management policy (Cassard and Folkerts-Landau 1997).

90 Quoted from the introduction by Peter F. Drucker.

91 “Central government” or “government” here means the sovereign borrower, which, in federal countries is called the federal government and in unitary countries the state. “Cabinet” is used to refer to the executive arm of the government.

92 Sovereign debt generally refers to any debt owed by a sovereign state. Sovereign debt can be raised in the domestic market of the sovereign and foreign markets and can be bilateral, multilateral, syndicated or bonded or a mix thereof.

This new way of thinking led to more focused public debt management, with clear objectives, strategy design, decision-making process, dedicated units or offices, evaluation processes and performance audits, in addition to traditional financial audits.

The legal framework around public debt had to adapt to the new reality. Borrowing authority is commonly delegated exclusively to the minister of finance. A public debt management law can be drafted as follows:

Subject to the provisions in this Law, the Minister of Finance has the sole authority to borrow on behalf of the Government, both in [insert the home country] and abroad and in local and foreign currencies, and to sign loan agreements, as well as agreements governing the sale of Government debt securities.

For practical reasons, the minister is normally given the right to delegate his borrowing power to the deputy minister of finance or the head of a dedicated debt management unit or office.

The law commonly restricts government borrowings to specific and listed purposes. The reason is to safeguard against borrowing for speculative investments or to finance expenditures not included in the annual budget or approved by the assembly or parliament in some other fashion (World Bank 2009).

Today, longer-term debt management objectives are codified by legislation. The law usually reads as follows:

The objectives of Government debt management are to ensure that over the medium to long term (i) the financing needs of Government are met on a timely basis, (ii) the borrowing costs are as low as possible, consistent with a prudent degree of risk and (iii) development of the domestic financial market is promoted.

Beyond broad strategic objectives, modern legal frameworks prescribe intermediate steps, too. Notably, the steps require the preparation and approval of a medium-term debt management strategy, with yearly updates to be submitted to the cabinet and annual evaluation reports to the assembly or parliament. In most cases, the strategy is drafted by a dedicated debt management unit, cleared by the minister of finance and approved by the cabinet. Basically, the same process is followed for the annual report, starting with a draft by the debt management unit, which the minister of finance and cabinet clear and then send for approval to the legislature: in other words, a formal and systematic process.

Once the debt management strategy has been approved, the debt management unit prepares an annual borrowing plan based on the forecast funding requirements, the approved debt management strategy and the cash flow projections. All are cleared by the minister of finance.

To summarize, the legal framework around debt management has evolved from almost nonexistent to almost procedurally prescriptive. The decision-making process has been stratified. The political level sets policy goals, the cabinet sets strategy, the minister of finance sets annual borrowing plans and *ex post* evaluation reverts to the

political level. The debt management unit prepares strategies and plans and, once approved, proceeds to execute them.⁹³ In the end, and to close the accountability loop, auditors step in to investigate whether performance goals (objectives) are clear, whether appropriate priorities and instruments have been chosen to achieve the goals (strategy), whether responsibilities are explicitly distributed between the levels of authority, bearing in mind the principle of subsidiarity, and whether emphasis on management controls and reporting requirements (internal control and evaluation) is adequate.

The legal framework has been developed with the interest of governments and, ultimately, of taxpayers in mind. Financiers have adapted to it through market interaction. They have crafted and continue to craft contractual arrangements that make the risk of financing sovereigns acceptable at reasonable prices.

The chapter elaborates on the laws that govern public borrowing and the protections that creditors use to make lending to sovereigns possible. Laws and protections are works in progress as they continue to adapt to changing market circumstances and the emergence of new financial instruments. Professional practice is as much the result of legal ingenuity as it is of trial and error. And today's best practices may not stay "best" forever.

8.2. Borrowing Authority: A Balance between Prescription and Delegation

Stemming from its constitutional power to approve taxes and expenditures, the assembly or parliament has the ultimate power to borrow on behalf of the country. The first level of delegation of borrowing power comes from the assembly or parliament to the executive branch. The delegation is given through legislation, such as a public debt management law. However, the following cases show that the delegation is not given without conditions.

In Kenya, the Public Finance Management Act, section 49 states:

...Subject to provisions of this Act, the Cabinet Secretary may, on behalf of the national government, raise a loan only if the loan and the terms and conditions for the loan are set out in writing and in accordance with (a) the fiscal responsibility principles and the financial objectives set out in the most recent Budget Policy Statement; and (b) the debt management strategy of the national government over the medium term.

That means that the cabinet secretary, i.e., the minister of finance, is authorized to borrow on behalf of the government only if the borrowing is in accordance with the fiscal responsibility principles and the financial objectives set out in the most recent budget policy statement and debt management strategy.

⁹³ The process is similar to that governing monetary policy frameworks and central banks: price stability is the policy goal, inflation targeting is the strategy and money supply management is the execution.

In Ghana, the conditionality is even more restrictive. Article 181 of the Constitution reads:

No loan shall be raised by the Government on behalf of itself or any other public institution or authority otherwise than by or under the authority of an Act of Parliament. An Act of Parliament enacted in accordance with this clause shall provide that the terms and conditions of a loan shall be laid before Parliament and shall not come into operation unless they have been approved by a resolution of Parliament.

Parliament has no right to delegate its constitutional borrowing mandate to the government, so all borrowings must be approved by Parliament. In practical terms, however, doing so would be impossible for borrowings through loans and bond markets due to the lengthy procedure of asking Parliament to approve each transaction.

Ghana has tried to solve this problem by including section 56 in the Public Financial Management Act of 2016:

(1) The terms and conditions of all government borrowings shall be laid before Parliament and shall not come into operation unless the terms and conditions are approved by a resolution of Parliament in accordance with article 181 of the Constitution. (2) For the purpose of subsection (1), Parliament may, from time to time, by resolution, approve standard terms and conditions for government borrowings including the following:

- a. the nature of facility;
- b. purpose of government borrowing;
- c. condition of drawdown;
- d. terms of interest payment and repayment;
- e. pre-payment and cancellation;
- f. fees and charges in respect of the borrowing;
- g. tax gross-up and indemnities;
- h. other indemnities;
- i. events of default;
- j. conduct of business by the parties;
- k. payment mechanisms;
- l. costs and expenses;
- m. remedies and waivers;
- n. amendments and waivers;
- o. governing law and jurisdiction;
- p. agent's option;
- q. arbitration;
- r. waiver of immunity;

- s. conditions precedent;
- t. conditions of payment;
- u. documents to be submitted;
- v. collateral security; and
- w. force majeure.

Whenever the terms and conditions of the borrowing are within the standard dictated by the law, they are automatically and formally approved by Parliament.

It can be challenging for a lender to determine whether the borrowing has been appropriately authorized, which is vital in any financial transaction.⁹⁴ The lack of authorization may lead to the nullity of the loan agreement, i.e., the loan agreement being declared invalid. Because of the practical difficulties in finding out whether a loan to a sovereign has been properly authorized, creditors resort to demanding a legal opinion from the highest legal authority of government, i.e., the chancellor of justice or attorney-general. The risk is that the legal opinion will be challenged, particularly after a regime change.

To avoid this risk, Zimbabwe has included section 24 in its Public Debt Management Act of 2015:

If a person, otherwise than in accordance with section 23, lends money to a Ministry, public entity, constitutional entity or statutory fund to which the Public Finance Management Act and this Act applies, or purports to issue on behalf of such a Ministry, public entity, constitutional entity or statutory fund a guarantee, indemnity or security, or enters into any other transaction which purports to bind such Ministry, public entity, constitutional entity or statutory fund to any future financial commitment, the State and that Ministry, public entity, constitutional entity or statutory fund shall not be bound by the lending contract or the guarantee, indemnity, security or other transaction.

Provided that any person wishing to (a) lend money to a Ministry, public entity, constitutional entity or statutory fund; or (b) enter into any guarantee, indemnity, security or other transaction purporting to bind such Ministry, public entity, constitutional entity or statutory fund to any future financial commitment, may, through the Minister, obtain the written opinion of the Attorney-General on the question whether such lending, indemnity, guarantee, security or transaction has been entered into in accordance to section 23, *and such opinion shall be conclusive of the question whether it is so compliant or not.* [Emphasis added.]

Because of the dire consequences of unauthorized borrowing, the lender's legal counsel should always check the domestic laws of the sovereign borrower and, when possible, assist in drafting the legal opinion to be signed and issued by the chancellor of justice or attorney-general. As listing allowed purposes of any

⁹⁴ In Ghana, entering into financial swaps and other derivative transactions is subject to the approval of Parliament under section 64 of the Public Financial Management Act.

sovereign borrowing is common in the law, the purpose of any planned borrowing should be included in the loan contract.

8.3. Definition of Debt

In the legal framework for sound debt management, definition of “debt” is a key issue.

The broadest definition is found in the macroeconomic statistical system. According to the IMF (2013), “debt” instruments are (1) special drawing rights, (2) currency and deposits, (3) debt securities, (4) loans, (5) insurance, pension and standardized guarantee schemes and (6) other accounts payable.⁹⁵

A broad definition of debt is also used by the World Bank in its Debtor Reporting System (DRS), covering the external debt by its borrowers. Here the “debt” covers all, public external debt, all publicly guaranteed external debt, as well as private non-guaranteed external debt.

In both the macroeconomic statistical system and the DRS, external debt is defined as “an obligation of a resident to a non-resident, in foreign and domestic currency.”

In public debt management laws, the narrowest definition of debt is limited to loans, which is used by many debt management units. In between are borrowing and other financial transactions similar to loans.

The legal framework should clarify the definition of “debt” for debt management. As an example, Ghana’s Public Financial Management Act, section 59 states that the debt management strategy shall be based on debt management objectives, and shall take into account, among other things, the cost and risk embedded in the current debt portfolio. A key question is what is included in the current “debt portfolio.”

To use the narrowest definition of debt to include only loans would exclude issuances of government debt securities for any purposes other than borrowing, such as regularizing outstanding arrears. All outstanding debt securities are logically included in the definition of debt. Similarly, if the government as guarantor decides to take over the loan service from a defaulted borrower, i.e., to step into the borrower’s shoes, the government clearly has a loan to service.

A financial transaction that is not a loan but similar to borrowing is a supplier’s credit agreement: a contract whereby goods or services delivered or supplied to the government are to be paid for at some future date extending beyond the end of the fiscal year within which the goods or services are delivered or supplied. A supplier’s credit agreement is basically a credit arrangement offered by the supplier of the goods.

⁹⁵ This broad definition of debt is commonly not used by the dedicated debt management unit or office, either for debt recording or for strategy development. The body that keeps track of special drawing rights and outstanding currency and deposits is normally the central bank. The government entity responsible for pensions seems best equipped to keep records of outstanding insurance and pension liabilities, and the accountant general looks after other accounts payable. In the statistical scheme, the only responsibility of the debt management unit is commonly only to keep records of (or gather information on) debt securities, loans and standardized guarantee schemes.

Thus, under Ghana’s Public Financial Management Act, section 102, “Debt includes a financial liability created by borrowing, credits accepted under supplier’s credit agreements, the issuance of debt securities, and assumption of the payment obligations under a guaranteed loan.”

Defining foreign debt as “an obligation of a resident to a non-resident, in foreign and domestic currency” is based on the capital and financial account of the balance of payment statement to keep track of the net portfolio flows of a country. A dedicated debt management office is focused on the cost and risks in the government debt portfolio, the main risks being foreign currency, interest rate and refinancing risk.

Derivatives are used in liability management to change the risk profile of the debt portfolio but do not affect the debt level. Because they change the risk profile of the current debt, they must be considered in preparing the debt management strategy and be properly recorded.

To summarize, the definition of debt for strategy preparation should preferably include all liabilities created by (1) borrowing, (2) entering into supplier’s credit agreements, (3) issuing debt securities for any purpose other than borrowing and (4) assuming payment obligations under guaranteed loans that have been called.

More detailed examples of some suggested Articles in a Public Debt Management Law are in the Annex, including the definition of “debt,” borrowing authorization, debt management objectives, preparation of the debt management strategy, publication of government debt and finance arrangements and the content of an annual report to the Assembly.

8.4. Other Public Sector Borrowers

Apart from the sovereign (the government), other public sector borrowers are local governments and public corporations (state-owned enterprises).⁹⁶ They are legal persons, i.e., with their own assets, liabilities, the right to enter into contracts and the legal capacity to sue and be sued.⁹⁷

As separate legal persons, local governments and public corporations have the basic right to borrow funds. The government, however, might restrict borrowings to certain purposes and/or markets. In the case of local governments, the restrictions can be found in the constitution⁹⁸ or in a separate local government law. Regarding public corporations, the restrictions can be found in the statutory instrument that set up the public corporation or in a separate law on state-owned enterprises.

The public debt management law may include a chapter on borrowing by local governments and public corporations, stating under what conditions they can

96 A “public corporation” is commonly defined as a corporation directly or indirectly controlled by the government, through ownership or in some other fashion, except for the central bank and a financial institution part or all of whose business is to lend or borrow money. Thus, legally using “public corporation” is better than the narrower “state-owned corporation.”

97 In some countries, the central bank is considered a legal person, mainly for historical reasons.

98 E.g., according to the Constitution of India, the States are restricted to borrow funds only “within the territory of India” (Article 293).

borrow, information they have to share with the debt management unit of the ministry of finance and a requirement that the debt management unit keep records of their outstanding debt thereafter.

For borrowing by public corporations, the public debt management law should preferably require the following:

1. A public corporation may borrow up to such limit as may be occasionally determined by the minister of finance.
2. For this purpose, the minister shall prescribe an annual borrowing limit for each public corporation based on its capacity to repay and such other considerations as the minister may determine.
3. Borrowing above such limit, any public issue of debt securities and any external borrowing require prior written approval by the minister. As part of the approval process for any public issue of debt securities and for any external borrowing, the public corporation shall send to the debt management unit of the ministry of finance all terms and conditions for each planned borrowing.
4. A public corporation shall submit to the debt management unit a record of its borrowing not later than 20 working days after the end of each quarter and shall upon request submit to the debt management unit such information and data on its total outstanding debt as it may specify.
5. The debt management unit shall keep timely, comprehensive and accurate records of outstanding debt of each public corporation in a database.

A parallel regulation should also be included in the public debt management law regarding local governments. The rationale behind the regulations is to reduce the implicit contingent liability of the government and to assure that the negative-pledge commitment of the government is not breached.

8.5. Negative Pledge Covenant

Commonly, sovereign borrowers do not pledge any collateral to their lenders. Instead, sovereigns promise not to pledge any of their assets as collateral to any other lender, i.e., they make a negative pledge. A breach of the negative pledge normally constitutes an event of default.

Lenders such as the World Bank and other international financial institutions (IFIs) include a negative pledge clause in their standard terms and conditions.⁹⁹ The negative pledges cover assets of not only the government but also the whole public sector, including public corporations and local governments.

The negative pledge clause of the World Bank reads as follows:

⁹⁹ In the case of the World Bank, the negative-pledge clause is included in all loans from the International Bank for Reconstruction and Development and all non-concessional lending by the International Development Association.

It is the policy of the Bank, in making loans to, or with the guarantee of, its member countries not to seek, in normal circumstances, special security from the member country concerned but to ensure that no other Covered Debt¹⁰⁰ shall have priority over its loans in the allocation, realization or distribution of foreign exchange held under the control or for the benefit of such member country. To that end, if any Lien¹⁰¹ is created on any Public Assets¹⁰² as security for any Covered Debt, which will or might result in a priority for the benefit of the creditor of such Covered Debt in the allocation, realization or distribution of foreign exchange, such Lien shall, unless the Bank shall otherwise agree, ipso facto and at no cost to the Bank, equally and ratably secure all Loan Payments, and the Member Country, in creating or permitting the creation of such Lien, shall make express provision to that effect; provided, however, that if for any constitutional or other legal reason such provision cannot be made with respect to any Lien created on assets of any of its political or administrative subdivisions, the Member Country shall promptly and at no cost to the Bank secure all Loan Payments by an equivalent Lien on other Public Assets satisfactory to the Bank.

As similar negative-pledge covenants are included in borrowings from any IFI, the government is, in practical terms, legally hindered from pledging any of its assets as collateral to any other lender as long as it has any outstanding loan from an IFI on its books.¹⁰³

The government allowing one of its public corporations, which it fully controls, to use corporate assets as collateral for foreign currency borrowing would amount to a circumvention of the negative-pledge clause. To ensure the government is aware of and avoids such a plan, the terms and conditions of any proposed external borrowing by a public corporation should be approved by the ministry of finance.

8.6. Legal Defense by the Government to Stop Servicing Its Loans

Once the sovereign borrower has signed a loan contract in a legally correct manner and the loan has been properly disbursed, the borrower can do little to avoid its debt service obligations. Sovereign debts bind the continuing legal entity of the government, including its future administrations and future generations (UNCTAD 2012, Principle 8).

In two cases, however, circumstances surrounding incurrence of a sovereign loan

100 "Covered debt" means any debt that is or may become payable in a currency other than the member country's currency.

101 "Lien" includes mortgages, pledges, charges, privileges and priorities of any kind.

102 "Public assets" mean assets of the member country, of any of its political or administrative subdivisions and of any entity owned or controlled by, or operating for the account or benefit of, the member country or any such subdivision, including gold and foreign exchange assets held by any institution performing the functions of a central bank or exchange stabilization fund, or similar functions, for the member country.

103 Examples of security packages agreed by sovereign borrowers are given in the second part of this chapter.

may give rise to a legal defense pertaining to the performance of that contract by the sovereign borrower. Creditor complicity in the corruption of government officials during the borrowing process is one. Transactions that hamper or directly imply violations of sanctions imposed by the United Nations Security Council are another (UNCTAD 2012, Principle 9). In the latter case, only the cabinet that has succeeded the sanctioned cabinet would likely be successful in raising such legal defense to stop servicing the loan.

The Gambia has added in section 45(2) of the Public Finance Act of 2014 that “in case of creditor complicity in the corruption of State officials in the borrowing process, the State is not obliged to repay and service that loan.”

What about “state necessity” as a legal defense for a sovereign borrower to stop its debt service obligations? Such a case was tried in Germany’s Constitutional Court in 2007 between German investors and the Republic of Argentina. The background was complex. In 2002, Argentina declared a public emergency and suspended its foreign debt service, claiming state necessity. The German investors who had bought Argentinian bonds issued in the German bond market contested that claim and sued Argentina in German courts for breach of contract. Argentina claimed that, according to public international law, a sovereign state has the right to postpone its debt service because of state necessity.¹⁰⁴

The case was settled by Germany’s Constitutional Court, which in 2007 ruled: “No general rule of international law is ascertainable which entitles a state to temporarily refuse to meet private-law claims by invoking state necessity declared because of inability to pay.”¹⁰⁵

Sovereign borrowers may attempt to take other legal paths to avoid servicing debt or to service it more cheaply. Two stand out and represent additional risk for the parties. One is sovereign bonds governed by the sovereign’s own domestic law, which can be changed by political action (Box 8.1). The other is terms and conditions that can be subject to interpretation and manipulation, notably *pari passu* clauses (Box 8.2).

Box 8.1. The Risk of Having Sovereign Bonds Governed by the Domestic Law of the Issuer

When Greece replaced its national currency with the euro in 2001, it began issuing domestic bonds in euros. The bonds continued to be governed by Greek law. In 2012, most of the outstanding bonds (about 86%) were governed by Greek law.

In response to its major debt crisis in 2009, Greece restructured its debt through a bond exchange. However, most foreign bondholders did not accept the offered terms. To force reluctant foreign bondholders to accept the offer, Greece changed the governing law of the bonds, which Parliament passed on Feb. 23, 2012. The Greek Bondholder Law compelled all holders of the bonds, including foreign bondholders, to participate and agree to the new terms offered.

Source: Author.

¹⁰⁴ In Germany, the general rules of international law are an integral part of federal law. They take precedence over domestic laws and directly create rights and duties for the inhabitants of the federal territory. See Article 25 of the Basic Law, which forms the German Constitution.

¹⁰⁵ German Constitutional Court (Bundesverfassungsgericht). 2007. Order of the Second Senate—2BvM 1-5/03, 1, 2/06, May 8. Seven judges voted against one.

Regardless of the available legal options, sovereign borrowers should note that raising such defenses could constitute a breach of the loan agreements it has entered into, which could give the lenders the right to stop further disbursements and/or require immediate repayment. Even where such defenses are successful, a sovereign borrower that has refused to honor its debt obligations can expect its reputation and ability to access capital to be impacted, at least in the short to medium term.

Box 8.2. The *pari passu* Covenant and the Case against the Republic of Argentina

The Republic of Argentina issued bonds in 1994, which included the following *pari passu* clause:

The Securities will constitute [...] direct, unconditional, unsecured and unsubordinated obligations of the Republic and shall at all times rank *pari passu* and without any preference among themselves. The payment obligations of the Republic under the Securities shall at all times rank at least equally with all its other present and future unsecured and unsubordinated External Indebtedness (as defined in this Agreement).

The bonds were governed by New York law. One bondholder was NML Capital, Ltd., an investment fund.

After defaulting in 2001, Argentina conducted two exchange offers, in 2005 and 2010, whereby more than 90% of its foreign indebtedness in default was restructured. Under the exchanges, Argentina allowed its bondholders to swap their defaulted bonds for new unsecured and unsubordinated external debt at USD 0.25 to USD 0.29 on the dollar. In its exchange prospectus, Argentina warned of its intentions to discontinue payment of the old bonds.

Some bondholders (including NML Capital) did not accept the exchange offers and litigated instead. Argentina lost the case and was obliged to pay NML Capital and other hold-out bondholders 100% of the principal and interest of their defaulted bonds concurrently or in advance of amounts paid by Argentina under the new exchange bonds.

Today, bond issues in international capital markets, including bonds governed by New York law, typically include a collective action clause, which allows a supermajority to bind all bondholders to the financial terms of a debt restructuring. For the history of the collective action clause, see Chung and Papaioannou (2020).

Source: *NML Capital, Ltd.; 573 U.S. 134 (2014)*.

8.7. Creditor's Perspective

“Adventure is the life of commerce, but caution is the life of banking” (Bagehot 2011). Taking risks is part of any business, particularly for lenders whose job is identifying, allocating, and pricing risks. Lenders are risk averse because their capital is subject to regulatory requirements; thus, they want the interest payable on the loan to reflect the expected risks they take. Any unidentified or unmitigated risk could reduce the expected returns on the lender's investment.

International financing is both an art and a science, and lenders come in many forms. Some are driven by policy and others by commercial returns; some are formed through multilateral treaties, and others are state or privately owned. Without exception, however, all reputable lenders aim to ensure that their clients

(i.e., borrowers) can repay the loans extended and, failing which, limit their potential losses by taking collateral. International financing crosses borders, making navigating multiple, often inconsistent, legal systems, rules and practices a necessity. Professional advice should always be sought. See Box 8.3 for some commonly used financing jargon.

Box 8.3. Financing Jargon

Bilateral loan, financing, lending, facility. Financing provided by one lender.

Syndicated loan, financing, lending, facility. Financing provided by a group of lenders.

Multilateral loan, financing, lending, facility. Financing provided by a multilateral institution, such as the Asian Infrastructure Investment Bank, the African Development Bank, the Asian Development Bank, the Inter-American Development Bank, the International Finance Corporation and the World Bank.

Uncommitted loan, financing, lending, facility. Financing where the lenders are under no legal obligation to lend.

Committed loan, financing, lending, facility. Financing where the lenders are under an obligation to lend in accordance with the terms of the finance documents.

Term loan, financing, lending, facility. Financing provided for a fixed period and repaid in accordance with an agreed schedule.

Revolving loan, financing, lending, facility. Financing that can be used, repaid and reused again by the borrower, in a manner not dissimilar to a credit card.

Source: Pinsent Masons LLP (no date).

In the context of loans involving sovereigns or state-owned entities, the risk matrix becomes even more complicated. From the borrower's perspective, a sovereign borrower is uniquely vulnerable. Sovereigns have no formal insolvency or bankruptcy process that can offer protection or discharge debt, and difficulties can be worked out only with a creditor's consent. Under the international law doctrine of state succession, sovereigns must honor debts incurred by previous administrations or predecessor regimes.¹⁰⁶ From the lender's perspective, however, the doctrine of sovereign immunity, which limits the legal actions that can be legally taken against a state, and the sovereign's ability to potentially bring the state's economic, diplomatic and martial resources to bear, are factors that must be considered as part of a lender's bankability analysis.

No universally accepted standard of bankability exists, and different lenders will look at things differently. Commercial lenders may consider bankability as a question of weighing the risk they are prepared to accept against the returns they are expected to receive. Better bankability may mean a borrower or project can attract more willing lenders and/or obtain better terms for its loan. Policy or multilateral lenders may emphasize furthering social, economic or developmental issues or strategic geopolitical interests. Different types of loans have different bankability requirements. A loan to a blue-chip sovereign or corporate borrower will be assessed differently from a limited recourse loan to a project company. Suppose bankability concerns cannot be satisfactorily tackled, and a lender considers a borrower or project to have an unacceptably high level of risk or uncertainty, which cannot

¹⁰⁶ See, for example, Article 36 of the Vienna Convention on Succession of States in Respect of State Property, Archives and Debts (1983): "A succession of States does not as such affect the rights and obligations of creditors."

be resolved. In that case, the lender may not provide finance. In such a case, the borrower or project is considered unbankable.

A borrower and/or project could improve bankability by working with prospective lenders and advisors to settle potential areas of concern as early as possible since legal limitations may exist on what a borrower can do to resolve structural issues at later stages. For example, many countries award concessions for public-private partnerships (PPPs) after a lengthy procurement process. If the terms of the concession are found to be unbankable after it has been awarded, going back and changing the terms of the concession may be impossible without breaching procurement laws. See chapter 7 for more information on PPPs.

We provide a practical high-level overview of how sovereign-related lending works in practice from the creditor's point of view. We divide financing into three distinct but often overlapping phases:

1. **Initial phase.** Starts from when the borrower realizes it wishes to borrow money to when work on the loan agreement formally starts.
2. **Execution phase.** When the parties are focused on preparing, negotiating and finalizing the contracts, including the loan agreement, security document and other ancillary documents (together referred to as the **finance documents**), as well as satisfying conditions for initial disbursement.
3. **Post-loan phase.** Starts immediately after initial disbursement and ends with either full repayment or the conclusion of any steps taken by lenders if the borrower cannot repay in full. The terms are used to facilitate understanding and are not terms of science.

8.7.1. Initial phase

The initial phase starts when the borrower realizes it needs financing to when work on financing contracts formally starts. The period can range from days to years. The initial phase sometimes overlaps with other phases, particularly when the financing involves an accelerated timetable.

The borrower will contact prospective lenders to identify, compare and extract the most favorable commercial terms. Where financing for a specific project (e.g., an airport, port, rail or others) is sought, the borrower should pay attention to whether it can demonstrate to a potential lender that risk in the project has been appropriately shared or mitigated. Inappropriate risk allocation is a major factor that leads to unbankable projects (see survey results in Zatar [2014]).

Most international financing is bespoke, with the financing structure and documentation tailored to reflect the parties' applicable laws, treaties, policies and commercial and tax considerations. Where financing is provided by a syndicate (e.g., a group of lenders), meeting every lender's requirements can be extraordinarily complicated, and the borrower usually appoints one or more lead banks to take charge and manage the process.

Inexperienced stakeholders usually focus on the loan agreement. They do not pay enough attention to the considerable work that has to be done before drafting of the loan agreement can begin. The loan agreement is the key document that sets out the loan's primary terms. However, the initial phase is when the borrower is best positioned to manage potential bankability hurdles. Doing so includes ensuring that all internal and external approvals and authorizations have been or will be obtained on time and that all environmental, sustainability and feasibility reviews have been completed satisfactorily. The process helps the borrower identify pending issues, resolve them in consultation with potential lenders and choose lenders with relevant expertise.

As a general principle, risk should be borne by the party best placed to manage it. For example, a borrower commonly mitigates construction risk by selecting a reputable contractor and entering into a turnkey contract,¹⁰⁷ under which the contractor will be responsible for completing construction on time and to the specifications and standards agreed. Operational risk may be mitigated by ensuring the project will be managed by a reputable operator or by entering into an appropriate operation and maintenance agreement. Market risk may be mitigated by entering into long-term offtake and supply contracts, which may include take-or-pay or take-and-pay arrangements.¹⁰⁸ Similarly, foreign exchange fluctuation risk may be mitigated by entering into hedging arrangements.

While a borrower may be tempted to offload all possible risks onto its lenders, suppliers, contractors and other business partners, doing so may not result in the most efficient outcome for the borrower. In some instances, the optimal approach may be for the borrower to accept certain risks that it is best placed to manage, such as a sovereign borrower accepting risk for changes of law and/or policy. A party required to take on risks that it is not best placed to manage will either have to put in place additional risk-mitigating measures (such as insurance) or increase the return margin to reflect the added risk, the costs of which are ultimately passed back to the borrower in one form or another.

Once mutual interest in the financing has been established, the lender will typically undertake a know-your-client assessment to comply with anti-money-laundering and other regulatory obligations and a due diligence review on the business and financial condition of the borrower (or the wider group in case of a holding company) to preliminarily determine the lending terms.

A thorough due diligence review of the borrower and its business ensures that the loan does not involve risks that the lender is unaware of and that could endanger the repayment of the loan. Depending on the type and size of the financing and the nature of the borrower's business, the focus and scope of the due diligence inquiry may vary. Due diligence must accomplish the following three basic elements:

1. Establish whether the borrower and any other parties have the capacity and authority to enter into the transaction.

¹⁰⁷ Under a turnkey contract, a contractor is engaged to plan, design and build a project and complete any other necessary development. In theory, the employer only has to "turn a key" to operate the project when it is completed. The International Federation of Consulting Engineers publishes standard forms of contract for use on major international turnkey projects.

¹⁰⁸ Commonly seen in mining, resources, agricultural and power projects, a take-or-pay arrangement typically refers to a contractual arrangement where the buyer agrees to either purchase a pre-agreed quantity of the goods or services in question or, alternatively, pay a minimum amount (typically used by lenders to establish the project's ability to repay). "Take-and-pay" is a variation of "take-or-pay."

2. Discover any impediments to the transaction, such as third-party consents and necessary regulatory approvals.
3. Assess the borrower's creditworthiness and assets (including the extent of potential collateral), as they may directly impact the likelihood of the lender being repaid.

In parallel to and consistent with the due diligence stage, the lender must consider what financing structure to adopt. It has to consider the web of treaties relating to double taxation, bilateral investment and recognition of judicial or arbitral proceedings, as well as applicable bankruptcy rules (Box 8.4), local law limitations on lending and taking of security. Doing so ensures that the lender can recover scheduled repayments and maximizes the prospects for recovery should the borrower default.

Box 8.4. Lenders Beware: Structural Subordination

Structural subordination refers to a situation where a nonoperating company without substantial assets is the borrower of a loan, but the borrower subsequently provides the proceeds from the loan to a subsidiary for its use.

Due to how insolvency and/or bankruptcy laws operate in many jurisdictions, structural subordination significantly increases the lender's risks should the underlying subsidiary become insolvent and should be strongly resisted.

Source: Authors.

If the lender believes that significant political and construction risks exist, it may require additional credit support from multilateral or export credit agencies. The lender may request specific representations and warranties, mandatory prepayment events, covenants or events of default in respect of actual or potential liabilities (such as pending litigations, disputed tax liabilities or incomplete approvals). The lender may ask the borrower to take specific actions (say, discharging existing debt and liens) before or within a specific period after initial loan disbursement.

Once the borrower and the lender have reached a preliminary agreement on the structure and the basic financing terms, they usually sign a terms sheet with other mandated documents. The terms sheet is customarily expressed as nonbinding, except for specific provisions such as confidentiality and exclusivity.

The importance of the initial phase should not be underestimated. Failure to identify structural issues and/or allocate risks appropriately at this stage could severely jeopardize or even derail the financing.

8.7.2. Documentation and negotiation phase

The documentation and negotiation phase refers to the period when the parties, having reached an initial agreement on the basic terms of the financing, finally sit down to discuss the details. During this phase, the parties prepare, negotiate and finalize the documentation for the loan and satisfy the conditions for effectiveness

or initial disbursement. While not binding, the terms sheet agreed upon during the initial phase will typically influence the terms of the finance documents as it provides a point of reference for any disagreements. The terms sheet could limit the lender's flexibility to reopen issues if the lender used it to obtain internal approval to proceed with the loan.

No two loan agreements are the same, and the terms of a loan agreement are typically a function of the lender's and the borrower's relative bargaining positions, market practice and whether the loan is bilateral, syndicated or multilateral. Bilateral loans involve two parties or two groups of stakeholders, giving them more flexibility to negotiate. Syndicated loans typically involve multiple lenders with sometimes widely different requirements and views, which could limit the scope for negotiations. Multilateral lenders require their own standard documentation, which is similar to commercial loan documentation but could include additional governance, management and access requirements far beyond those usually required by commercial lenders.

CUSTOMARY LOAN AGREEMENT TERMS

A **loan agreement** specifies the loan type and whether on a committed or uncommitted basis. It sets out how interest is calculated and when it will be paid. Interest rates can be fixed or variable. If variable, it will be calculated by adding an agreed margin to a variable benchmark rate (for example, London Interbank Offered Rate, Euro Interbank Offered Rate, Shanghai Interbank Offered Rate, China loan prime rate, the Sterling Overnight Index Average or the secured overnight financing rate).¹⁰⁹ Some lenders, including multilaterals, may calculate interest differently from usual market practice: for example, when a given percentage of the lender's cost of funds (excluding margins) exceeds the interest rate written in the documentation.

There are valid reasons for drafting loan agreements to favor the lender. Its expected returns are largely fixed. Furthermore, should the borrower fail to repay after loan disbursement, the lender's ability to manage and/or recoup its losses will depend wholly on the documentation's robustness. From the borrower's perspective, the negotiation should ensure that the loan agreement satisfactorily addresses any circumstances specific to the borrower (or the project) and provides sufficient flexibility for successful business operations. The borrower should try to avoid hair triggers and be allowed to remedy any nonmaterial breaches of the loan agreement.

Due to differing commercial practices and legal considerations, loan agreements from different markets or lenders can, at first glance, look extremely diverse. However, most loan agreements on international financing transactions can be expected to contain at least conditions precedent to drawdown, operational terms such as the amount being borrowed, drawdown mechanics, the repayment schedule and interest, representations and warranties, undertakings, events of default and other standard clauses such as those relating to governing law and jurisdiction.

Interest is payable periodically, but the principal may be repaid on a specified date, according to an agreed repayment schedule or upon demand by the lender. A

¹⁰⁹ See for example, the various forms of loan agreements recommended by the Loan Market Association (available to members only).

loan agreement often includes provisions that permit or require early repayment in certain circumstances.

A condition precedent to disbursement is a contractual term that describes what must be satisfied before the borrower can request that the loan be disbursed. If a loan agreement contemplates multiple drawdowns, the conditions precedent will typically include true and correct representations and warranties for each drawdown. From a legal perspective, other types of conditions precedent may be included in a contract and must be reviewed carefully by professionals.

Conditions precedent are tailored and negotiated by reference to the circumstances of the specific borrower and other obligors,¹¹⁰ the purpose of the loan, the security package (if any) and issues identified during the due diligence investigation. But, at a minimum, the lender will need to be satisfied regarding the powers of the borrower, authorization of signatories, financial information, security documents and perfection, absence of major litigation or disputes, absence of potential defaults, legal opinions and payment of fees, among others. Where co-financing is involved (whether with multilateral, bilateral or private capital), it would be customary to see the inclusion of conditions-precedent on the effectiveness of the co-financing. In the context of multilateral lenders, adopting reporting, operational, governance or sustainability-related guidelines or policies are typically required as conditions precedent. For example, a loan made to construct an infrastructure project may include specific conditions on the progress and quality of construction, environmental and sustainability requirements and acceptance testing, while an export financing loan may require issuing a political and/or commercial risk cover by an export credit agency (ECA).¹¹¹

A borrower should focus on framing any conditions precedent in an objective, achievable and relevant manner. A lender tends to require the ability to determine whether the conditions precedent have been fulfilled and may include catch-all conditions precedent while reserving the power to waive any condition precedent after the loan agreement is signed. For the borrower, the arrangement may or may not be acceptable.

Operational terms refer to contractual terms for the loan operations, including the making and use of disbursements, timing and requirements for repayment, payment and calculation of interests and the fees and costs payable by the borrower.

Representations and warranties are statements of fact made by the parties to the loan at certain points, such as the date of signing, date of disbursement and other pre-agreed dates. Representations and warranties form the factual basis on which the lender has decided to lend to the borrower. Thinking of them as periodic “health checks” by the lender may be useful. See Box 8.5 for examples of some basic customary representations and warranties.

¹¹⁰ The term is usually used as shorthand to refer to any party on the borrower’s side that has obligations toward the lender under the finance documents, including, for example, any guarantor and any person providing security or credit support for the loan.

¹¹¹ ECAs are usually governmental or quasi-governmental agencies established to facilitate and promote the export of goods and services by providing direct loans, guarantees, insurance or other forms of assistance. For example, see Hull No. J34 Credit Agreement (2016) for insurance cover required to be provided by BpiFrance Assurance Export, a French ECA, as a condition precedent, and see USD 150,000,000 Loan Agreement (2015) for insurance cover required to be provided by Finnvera plc, the Finnish ECA, as a condition precedent.

Box 8.5. Customary Basic Representations and Warranties

- **Legal formation and existence.** Confirm the legal status and capacity of the borrower and other related parties, if any, and their power to own their assets and conduct business.
- **Binding obligations.** Confirm that the finance documents are legal, valid, binding and enforceable.
- **Non-conflict.** Confirm that the loan transaction does not conflict with the legal or contractual obligations of the borrower and other related parties, if any.
- **Power and authority.** Confirm that the borrower and other related parties, if any, have the requisite power and authority to borrow the loan. If a project is involved, power and authority may be extended to include the project.
- **Validity and admissibility in evidence.** Confirm that all actions to ensure that the finance documents are valid and admissible as evidence have been complied with.
- **No default.** Confirm that no actual or potential event of default has occurred.

Source: Authors.

Loan agreements that allow certain representations to be repeated at regular intervals¹¹² should be carefully reviewed to ensure that the frequency and the representations to be repeated are appropriate.

Representations are usually broadly drafted, and the borrower may seek to limit certain representations and warranties (for example, those relating to litigation and other potential disputes) by adding materiality qualifiers or ensuring that representations are made concerning matters that can be proven objectively. Other common negotiation tactics include proposing *de minimis* thresholds or adding qualifiers to link the representation to “material adverse effect.” An example of such qualifiers is a 2016 loan agreement between the International Finance Corporation (IFC) and Banco De Galicia y Buenos Aires SA, which qualified representations on the borrower’s financial conditions and litigation in that manner (Master Loan Agreement 2016).

All parties should focus on ensuring that risk is reasonably shared and that the borrower will be able to make the representations. Breach of a representation and warranty can trigger an event of default, upon which the lender would be entitled (but not required) to suspend disbursement and/or demand repayment of the loan.

Undertakings (also, **covenants**) are the borrower’s promises to do and not do certain things while the loan remains outstanding. Undertakings can impose positive, negative or financial obligations on the borrower. In recent years, the inclusion of specific environmental, sustainability, developmental and social undertakings and related reporting is becoming increasingly standard, particularly where multilateral lenders or policy banks are involved.¹¹³

Positive undertakings are promises by the obligor to do certain things. Typical positive undertakings include obligations to comply with laws and environmental

¹¹² Such repeating representations are typically deemed to be made with reference to facts or circumstances at the time they are repeated.

¹¹³ For example, see Common Terms Agreement (2018) for undertakings in relation to IFC environmental and social requirements.

and other requirements, keep *pari passu* rankings, maintain all authorizations and licenses and provide financial statements, management accounts and other information to the lender and others. Covenants requiring the borrower to make capital investments or construct facilities following an agreed schedule and to complete construction by a certain date may be included for loans involving projects.

Negative undertakings are things the obligor promises not to do and may include restrictions on borrowings, non-disposal of assets, mergers and acquisitions, provision of loans or guarantees and creation of security interest (e.g., negative pledge).¹¹⁴ Negative undertakings ensure that the obligor does nothing that might affect the borrower's creditworthiness or the original bankability analysis.

Positive and negative covenants ensure that the obligor conducts its business prudently. They are intended to facilitate understanding, and readers should not focus too much on categorizing different covenants. Most covenants can be expressed positively or negatively to reach the same outcome.

Undertakings on a borrower's financial performance and creditworthiness are referred to as financial covenants (Box 8.6). These covenants set out the financial parameters within which the borrower must operate while allowing the lender to monitor the financial position and health of the borrower periodically.

Box 8.6. Commonly Used Financial Covenants

Net worth. Measures the amount of equity and requires the maintenance of a minimum ratio of assets against liabilities.

Leverage ratio. Measures ability to repay the loan based on cash flows.

Debt coverage ratio. Measures the ability to repay the principal and interest and, potentially, other debt based on a company's cash flow.

Interest coverage ratio. Measures the ability to repay interest based on cash flow.

Source: Authors.

Financial covenants are tailored for each borrower and project and affected by the nature of the borrower's business and accounting policies and the nature of the loan in question. Financial covenants should be negotiated with appropriate financial and legal input.

The most used financial covenants include debt coverage, leverage, net worth, cash flow and limits on capital expenditure, which can be formulated and measured in numerous ways. How covenants should be defined and calculated, whether they should apply just to the borrower or to a wider group and whether the borrower's shareholders can remedy any breach of financial covenants by providing additional equity (e.g., equity cure) are usually subject to intense negotiation. Because financial performance may be subject to cyclical fluctuations, the borrower should try to negotiate some headroom into the financial covenants so that a default will not result from expected cyclical fluctuations.

¹¹⁴ Unlike World Bank negative-pledge clauses, which purport to automatically give the World Bank a right to share in any security given, typical negative-pledge clauses simply prohibit the giving of security unless an exception applies.

In practice, because financial covenants can be calculated by reference to the borrower's financial statements and accounts, their breach is often considered to provide the most robust basis for triggering an event of default.

Events of default refer to certain events as described in the loan agreement (Box 8.7). Upon occurrence, an event of default will give the lender the right (but not the obligation) to suspend further disbursement and/or accelerate the loan by requiring the borrower to repay the outstanding loan immediately and to take action to enforce any guarantees or security. Upon an event of default, the lender may have the option to place outstanding loans on an on-demand basis, cancel commitments to make further drawdowns or wait for further developments.

Box 8.7. Typical Events of Default

Nonpayment. This is triggered by any failure to pay any amount due and payable to the lenders. Most lenders do not accept remedy periods of more than two or three days unless the failure to pay is due to an administrative or technical error.

Noncompliance. This is triggered by any failure to comply with any finance document. Because of what noncompliance can potentially cover, a longer remedy period is usually given.

Misrepresentation. This is triggered by any untrue representation or warranty. Because misrepresentation is a statement and some believe a statement once made cannot be taken back, some lenders may not accept any remedy period. However, for repeating representations, a remedy period similar to a noncompliance event of default may be considered.

Cross-default. This is triggered by any failure to perform obligations under any loan agreement signed with any third party. Usually, a *de minimis* threshold is given, but a lender may be reluctant to agree to a remedy period.

Insolvency. This is triggered by any obligor's bankruptcy or commencement of bankruptcy proceedings. A remedy period is not given for actual insolvency, but for initiation of involuntary insolvency, a short remedy period may be given to set aside frivolous or vexatious actions.

Creditors' process. This is triggered by any third-party creditor commencing formal enforcement actions against any obligor. A short remedy period may be given to set aside frivolous or vexatious actions.

Repudiation. This is triggered by any action or lack of action that indicates intention to not abide by the finance documents. Because this event of default is dependent on the borrower's actions, no remedy period is usually given.

Material adverse change. The occurrence of unforeseen circumstances that might materially increase the lender's risks. The focus is on the trigger, and no remedy period is usually given.

Source: Authors.

Most loan agreements draw a distinction between an **event of default** and a **potential event of default**, which is any event capable of becoming an event of default but has not yet fully matured.¹¹⁵ Unlike an actual event of default, a potential event of default will only give the lender the right to stop disbursements until the potential event of default can be resolved, but not the right to accelerate the loan.

Customary events of default include nonpayment, breach of any finance document, misrepresentation, cross-default, major litigation, insolvency, unlawfulness, expropriation, creditor's process, repudiation, moratorium and material adverse change (MAC). Most events of default will give the borrower time to undertake remedial actions. Including qualifiers or limits on applicability for certain events of default may be appropriate and is often intensely negotiated. **Cross-default** and **MAC** usually give rise to heated discussions.

A cross-default clause is a contractual provision that triggers a default when the borrower defaults under a separate loan agreement. A cross-default clause should not be confused with a cross-acceleration clause, triggered when a third-party lender demands repayment (e.g., acceleration) under the loan agreement after the borrower defaults. Due to the time required before lenders can decide to accelerate and initiate recovery action after a default occurs, a cross-acceleration clause is generally considered to strongly favor the borrower and is difficult for most lenders to accept except for their most creditworthy and favored clients.

Cross-default clauses (Box 8.8) are almost always mandatory in international financing loan agreements, including loans provided by multilateral and policy lenders. The lender's rationale for justifying cross-default is simple: If a borrower cannot repay or fails to perform its agreed contractual obligations elsewhere, it is also unlikely to be able to repay or perform its obligations toward the lender. From the borrower's perspective, however, cross-default focuses on the potential anticipatory breach of the loan contract and may result in disputes over relatively small debts pushing larger loans into default. As a result, cross-default clauses customarily have *de minimis* thresholds and other qualifiers.

Box 8.8. Cross-Default Clauses

A typical cross-default clause triggers a default when a borrower

1. is unable to pay any debt when it is due,
2. has any outstanding debt accelerated as the result of default,
3. has any loan commitment (e.g., loan promised but not yet disbursed) canceled as the result of default or
4. is placed in a position where its other creditors can accelerate its outstanding debt as the result of default.

Other variations may exist, including cross-default triggered by reference to types of projects or countries.

Source. Authors.

¹¹⁵ The reason may be that under the loan agreement, the obligor still has time to take remedial actions, or the loan agreement specifies that an event of default will occur only after the lender makes certain determinations.

A MAC clause refers to an event of default that occurs if the obligor's obligations or the lender's rights under the finance documents are materially and adversely affected by the actual or potential occurrence of unforeseen circumstances. A MAC clause can result in an event of default even if the events or circumstances do not fall under any of the other events of default in the loan agreement. Like cross-default clauses, MAC clauses are almost mandatory in international financing loan agreements. However, while certain multilateral lenders require cross-default clauses, some have a policy not to require MAC clauses in loan agreements. The reason is that while MAC clauses appear to provide the lender with considerable protection, from a legal and factual perspective, any party would have great difficulty conclusively proving whether a MAC has occurred. As a result, while MAC clauses are much negotiated, most lenders are extremely reluctant to rely on them as the sole basis for acceleration.

Material adverse effects and MAC are sometimes used interchangeably but remain different. A MAC refers to an event of default, while a material adverse effect refers to an event that can work in favor or against either the borrower or the lender, depending on the context, such as where representations, covenants or conditions precedent to disbursement are qualified by material adverse effect or as a trigger for MAC.

The loan agreement is a contract that contains a set of rights that do not magically enforce themselves when breached. The **governing law** and **dispute resolution clause** determine the mechanism (e.g., arbitration or litigation), processes and legal framework for resolving disputes that may arise under or in connection with a loan agreement. Lenders must ensure that finance documents not only satisfactorily address issues of governing law and dispute resolution but are also valid and enforceable under the law.

In the context of international lending, for historical reasons, lenders prefer to use the laws of England and Wales or the state of New York and English or New York courts. English and New York laws are considered more lender friendly, and the courts are well-versed in sophisticated financial matters. However, with globalization and the increasing demand for capital by developing countries, uncertainties relating to enforcing English or New York judgments across jurisdictions became a major concern for lenders. As a result, international arbitration has quickly become a highly popular method for resolving disputes.¹¹⁶ A 2021 survey found that 90% of respondents consider international arbitration to be the preferred method for resolving cross-border disputes and highlighted London, Singapore, Hong Kong, Paris and Geneva as the five most preferred seats for arbitration (White & Case LLP and the School of International Arbitration, Queen Mary University of London 2021).

International arbitration is a private way to resolve disputes. The parties can agree on where arbitration proceedings should be held, who the arbitrator should be and what governing law should be applied. Unlike court proceedings, arbitral proceedings are not required to be made public.

¹¹⁶ Unlike cross-border recognition of court judgments, which rely on treaties and reciprocal arrangements, the 1958 United Nations Convention on the Recognition and Enforcement of Foreign Arbitral Awards (New York Convention) obliges its signatory countries to, subject to limited exceptions, honor qualifying arbitral awards without a reexamination of merits. The New York Convention is a multilateral treaty with more than 160 signatory states.

Sovereign immunity is a principle of customary international law and provides that one sovereign state is exempt before the courts of another sovereign state unless the former has given consent. The courts might decline to hear a dispute or take action against a sovereign unless immunity can be shown either to not apply or to have been waived.

Sovereign immunity is a key bankability concern for the lender, as a borrower or any obligor in the contract might be part of or otherwise have connections to the government and claim immunity by extension. When a loan is disbursed, the borrower and the lender are effectively trading money for a set of contractual rights. If the rights cannot be legally enforced, lending cannot proceed.

Jurisprudence relating to sovereign immunity is complex, and different courts and legal systems have different approaches. Practically, however, a waiver of immunity will be required by the lender if even the slightest question arises that a sovereign might be involved. A sovereign immunity waiver should be professionally reviewed and specifically waive jurisdictional immunity as well as immunity on attachment and execution.¹¹⁷

A large portion of the loan agreement will be occupied by other clauses: administrative and “boilerplate” clauses and protective clauses. Administrative and boilerplate clauses include confidentiality and disclosure, payment waterfalls, partial invalidity, further assurances, details for correspondences and provisions relating to transfers and assignments. Lenders consider them standard contractual provisions as they are legally or administratively essential.

Protective clauses generally refer to those covering, for example, increased costs, market disruption, tax gross-up, indemnities and limitations of liability, all designed to insulate the lenders’ expected returns against unforeseen risks. Commercial lenders tend to have limited room for negotiation on these clauses, and multilateral and policy lenders may have their own specific requirements. An illustrative example is the 2017 loan agreement between IFC and the Capital City of Podgorica, Montenegro, which contains IFC’s mandatory language concerning access to the borrower’s facilities, records and personnel by the IFC’s independent accountability mechanism, the Compliance Advisor Ombudsman.

CREDIT SUPPORT AND SECURED LENDING

From a legal perspective, the terms security and collateral refer to property being provided or pledged to secure the fulfillment of an obligation, usually the repayment of a loan. Laws usually give the party holding a legally enforceable security or collateral additional rights and preferential treatment when the borrower cannot repay. Security is not to be confused with credit support, which is broadly used to refer to anything that supports credit and bankability and may not necessarily give rise to any additional rights or benefit any preferential treatment as a matter of law.

A lender may provide financing on an unsecured or secured basis. A lender that

¹¹⁷ Epitomized in the maxim *par in parem non habet iudicium*, jurisdiction immunity refers to the ability of the courts to hear a dispute involving a sovereign. Immunity on attachment and execution, on the other hand, deals with the highly sensitive issue of courts ordering the attachment or enforcement actions against sovereign assets, such as issuing an order to seize a building owned by a sovereign borrower.

has taken security for a loan should, subject to any rules of priority or perfection or registration requirements, be protected in the case of the borrower's insolvency to the extent of the value of the secured assets and may be able to be repaid in full and ahead of the borrower's other unsecured creditors.

What may be taken as security depends on what the parties can agree on and what is practicably available under the applicable laws. Most legal systems require security over tangible assets, such as land or building, to be subject to *lex situs* or the law of the land where the assets are located. The law applicable to security over intangible assets such as shares, negotiable instruments or cryptocurrencies may, in some cases, be chosen by the parties based on their requirements. The structuring of security packages can be highly sophisticated and creative. The financing of the Bui Dam in Ghana (see below) is an example of how parties can look to security over expected future revenues to support a loan.

Using English law as an example, security may be categorized principally as a mortgage, pledge, charge or lien. Other legal systems may recognize other types of security interest, such as hypothecation or purchase money security interest. Lenders should always seek professional help when dealing with security interests, and professional advice should confirm the robustness of the security structure and documentation.

Credit support for financing can include security interest and any other arrangement that does not necessarily give rise to a legally recognized security interest but enhances the borrower's creditworthiness. Credit support may include guarantees and equity contributions undertaken by the borrower's shareholders, direct agreements (which give the lender direct rights regarding certain key project documents in a project finance transaction), letters of credit and comfort letters.

As a matter of practice, sovereigns do not usually provide security for their borrowings. However, this is not a strict rule – exceptions exist. The IMF and World Bank recently noted that “the availability of collateralized financing can be beneficial to a developing country borrower under a range of circumstances, but also point to pitfalls. Whether or not the benefits of collateralized financing outweigh its drawbacks requires a case-by-case assessment.” They state that the secured debt is more likely to lead to beneficial outcomes if the transaction results in a productive asset and a future revenue stream (as opposed to the financing of consumption or general fiscal debt), the reduced risk is reflected in more favorable lending terms, a rigorous debt sustainability assessment is passed, there is full public transparency on the contractual terms and the collateralization complies to any applicable Negative Pledge Clauses. If these conditions are not in place, it is suggested that the collateralized financing could be harmful and impede future creditors' ability to assess risks correctly and lend sustainably (World Bank 2020).

One type of credit support frequently required and accepted by lenders from China is a forward-looking arrangement involving a special purpose account. Special purpose accounts were mandatory under the Marshall Plan (Economic Cooperation Act of 1948 [section 115(b)(6)], Brown and Opie 1953), and lenders from China later adapted the practice. A basic version of the current iteration involves the obligors

pledging a project's future revenues to repay the loan and agreeing to sequester such revenues in a special purpose account that can be used only with the lenders' consent. The arrangement helps bolster the borrower's creditworthiness if the future revenue stream can be demonstrated to be from a creditworthy buyer and the legal obligation to pay is robust. Some special purpose accounts may constitute a 'security' if structured as such.

Ghana's Bui Dam, for example, was financed by the Export-Import Bank of China and structured to receive support from the expected future income of Cocobod, Ghana's marketing board for cocoa, and from an offtake arrangement based on revenues generated by future electricity sales. The Cocobod arrangement featured a long-term sales agreement for the sale of up to 40,000 tons of cocoa beans annually in a foreign currency for the first five years of the loan, which partially mitigated revenue and foreign exchange risk.

Another example is Kenya's Standard Gauge Railway project, which was also financed by the Export-Import Bank of China and relied on the railway's general revenues as its primary source of repayment. The project received additional credit support through a take-or-pay agreement, which guaranteed a minimum amount of cargo traffic to Nairobi and an undertaking by the Kenyan Port Authority to impose a 1.5% railway development levy on all imports. Similar arrangements have been used globally by other lenders from China.

In deciding whether to apply such arrangements, borrowers are advised to assess each case individually and seek to put in place the recommendations listed above by the IMF and World Bank.

8.7.3. Post-loan phase

Unlike a sale-and-purchase transaction, where the parties' obligations are largely concluded once money and goods have changed hands, a financing transaction is an ongoing relationship. A project financing, for example, can have a repayment period of more than a decade, well after the project is completed. The financing structure and documents must be designed and maintained to accommodate evolving business, market, economic and geopolitical conditions.

A loan agreement should not be forgotten as soon as it has been signed and disbursed. The borrower and lender should have a plan and system to monitor compliance and performance. Open and timely communication and a commitment to transparency will go a long way to ensure that any potential issues can be worked out promptly.

Documentation that cannot adequately address changing conditions may need to be updated if the parties are otherwise satisfied with the ongoing lending relationship. Temporary or one-off events that result in the obligor's noncompliance with the finance documents may be resolved through a waiver, while amendments to the documents should tackle more permanent changes.

The borrower mostly initiates requests for waivers and amendments after realizing

it has breached—or is likely to soon breach—the finance documents by proactively contacting the lender with an explanation and a remedial proposal. Once the lender evaluates the request, it may either agree to the borrower’s proposal or impose additional conditions. The borrower should remember that even for simple waivers, a lender will likely have to wade through considerable internal procedures and, consequently, charge a fee. The process can be even more protracted for syndicated loans, as each lender must go through its own internal processes before making a collective decision.

Where the default in question is nonmaterial, and a reasonable explanation is given, the process for a waiver or amendment is usually manageable. An example might be where the borrower cannot provide its audited financial statements as required by the loan agreement for some reason, including government-imposed pandemic measures (see, for example, Hong Kong Institute of Certified Public Accountants [2020]). Where the default relates to nonpayment, however, or could impact the original bankability assessment or any obligor’s creditworthiness, then the process is bound to become much more difficult and protracted.

Waivers should not be open-ended but may be given subject to conditions, including taking remedial actions by a certain date and payment of a waiver fee. Waivers must be carefully documented to ensure that only known defaults are waived to avoid a situation where the lenders inadvertently waive unknown, potentially serious defaults (see, for example, Limited Waiver and First Amendment to Credit Agreement and Termination of Revolving Commitments [2012]).

As a matter of law, waivers can sometimes be deemed to have been given by the conduct of the lender: for example, the lender can be found to have waived the borrower’s payment default by accepting late payments (see, for example, Lombard North Central plc v European Skyjets Ltd [2022]). Following a default by the borrower, as a prudent approach, the lender should act promptly either to waive such default or expressly reserve its rights in writing through a reservation-of-rights letter.

Where a default is fundamental and cannot be easily resolved, the parties may have to restructure the original financing. Doing so may involve revising the originally agreed interest rate, repayment terms and schedule, and financing structure. If a restructuring cannot be agreed upon, the lender may resort to enforcement actions.

8.8. Conclusion

The first part of the chapter focuses on the central government as borrower, its institutional framework and its daily debt management activities. Commonly, the law clearly states longer-term debt management objectives, the strategy design, the decision-making process, the role of dedicated debt management units or offices, evaluation processes and performance audits of government debt management activities. One crucial issue is whether government borrowing has been properly authorized, which can be difficult for an external lender to find out.

Another difficult area is defining government debt. The chapter recommends a definition of debt as somewhere between the broad macroeconomic definition and the narrow definition of borrowings only. The government should monitor and keep records of public sector debt and expressly authorize certain borrowings. Finally, the chapter covers the negative-pledge covenant, the legal defense to stop servicing the debt and issues regarding the *pari passu* covenant and governing law, all of interest to lenders.

The second part of the chapter focuses on the risks lenders take when lending funds. Lending is a business based on lenders reusing their limited capital to generate income. All lenders, whether multilateral, commercial or policy, do everything to ensure that they are repaid or, failing that, to minimize their potential losses. Lenders can achieve that through proper due diligence, robust structuring and mitigation of risks through documentation and credit enhancement. Borrowers that understand how lenders look at bankability can work with them and preemptively minimize or mitigate potential bankability concerns, thereby reducing the hurdles to disbursement and lowering funding costs.

To provide readers with the lender's perspective, the second part focuses on bankability and the process of lending. Lending gives rise to an ongoing relationship where parties' interests are ultimately aligned in ensuring that the borrower is successful in its endeavors so that it can repay the lender.

Sovereign-related lending could place the lender and the borrower in vulnerable positions. Due to legal and practical considerations, a lender has limited ability to seek redress against a defaulting sovereign borrower. Similarly, a sovereign borrower that cannot repay cannot seek bankruptcy protection or discharge its debt without the creditor's consent. Participants should recognize and understand the dichotomy and its impact on bankability and the process of lending.

Annex

Drafts of Possible Provisions to be included in a Public Debt Management Law

Definition of “debt”

“**Debt**” includes all financial liabilities created by (i) borrowing, (ii) entering into supplier’s credit agreements, (iii) issuances of debt securities for any other purpose than borrowing and (iv) assumptions of payment obligations under guaranteed loans that have been called.

Borrowing authorization

Subject to the provisions in this Law, the Minister of Finance has the sole authority to borrow on behalf of the Government, both in XX and abroad and in local and foreign currencies, and to sign loan agreements and agreements governing the sale of Government debt securities.

According to the Constitution, any international loan agreement that is considered a treaty must be ratified by the Assembly.

All borrowings shall be for any of the purposes stated in Article X.

Debt management objectives

The objectives of Government debt management are to ensure that over the medium to long term (i) the financing needs of the Government are met on a timely basis, (ii) the borrowing costs are as low as possible, consistent with a prudent degree of risk and (iii) development of the domestic financial market is promoted.

Preparation of the debt management strategy

A medium-term debt management strategy for managing Government debt shall be formulated and updated at least once a year on a rolling basis by the debt management unit of the Ministry of Finance, be reviewed by the Minister and submitted to the Cabinet for final approval.

The strategy shall be based on the debt management objectives stated in Article XX and shall take into account

- i. the cost and risk embedded in the current Government debt portfolio and outstanding derivative transactions;
- ii. future borrowing requirements of the Government;
- iii. the determined fiscal strategy and the macroeconomic framework;
- iv. market conditions; and
- v. such other factors as may be relevant for development of the strategy.

The strategy document shall include ranges for the acceptable market risks in the debt portfolio, as well as planned borrowings and other debt management activities to promote domestic financial market development.

The central bank shall be allowed to provide written comments on the draft strategy before the Cabinet approves it.

Upon determination and approval of the strategy, the strategy, or a summary, shall be published, and all Government borrowing and other debt management operations shall align with the strategy.

Publication of Government debt and finance arrangements

The debt management unit of the Ministry of Finance shall frequently, at least half-yearly, prepare and publish statistical bulletins that provide accurate and timely information on, among others,

- i. debt stock, debt flows, debt service cost, redemption profile and other risk measures of the debt portfolio of the Government;
- ii. derivatives used as hedges against the financial risks embedded in the Government debt portfolio;
- iii. loan guarantees issued by the Government and the beneficiaries of these guarantees;
- iv. lending provided by the Government and the borrowers of these funds;
- v. supplier's credit agreements entered into by the Government and the purposes of these agreements; and
- vi. finance lease agreements entered into by the Government, the purposes of these agreements and the counterparts to the Government.

Content of the annual report to the Assembly

The debt management unit of the Ministry of Finance shall each year prepare a draft annual report on borrowings and other Government debt management operations, loan guarantee and lending activities, and other financing arrangements entered into over the previous financial year. The report shall include

- i. information on the debt management strategy and its rationale;
- ii. information on the contribution of the debt management strategy and its execution in achieving the debt management objectives as stated in Article XX, and the rationale for any significant deviations;
- iii. a list of outstanding debt;
- iv. a list of outstanding loan guarantees, including amounts and beneficiaries of these guarantees, and an assessment of the credit risk in the outstanding stock;
- v. a list of outstanding lending operations, including amounts and borrowers of these loans, and an assessment of the credit risk in the outstanding stock; and
- vi. a list of outstanding supplier credit agreements and finance lease agreements, including the financial terms of those contracts.

The Minister shall review the draft report, send it to the Cabinet for written comments, and finally submit it to the Assembly for information no later than end [month].

References

- Abdul Rahman, Ismail & Memon, Aftab & Mohd Zulkiffli, Nora. 2014. Failure Reasons of PPP Infrastructure Projects: Case Study of Kuala Lumpur LRT Project. *Life Science Journal* 11 (7).
- Acker, Kevin, Deborah Brautigam, and Yufan Huang. 2020. Debt Relief with Chinese Characteristics. *China Africa Research Initiative Policy Brief 46*. School of Advanced International Studies, Johns Hopkins University, Washington, DC.
- Bagehot, Walter. 2011. *Lombard Street: A Description of the Money Market*. Cambridge, United Kingdom: Cambridge University Press.
- Basic Law of Germany of 1949.
- Block-Lieb, Susan and W. Mark C. Weidemaier. 2019. Lenders' Roles and Responsibilities in Sovereign Debt Markets. *The Fordham Law Archive of Scholarship and History*: 1589.
- Brautigam, Deborah and Won Kidane. 2020. China, Africa, and Debt Distress: Fact and Fiction about Asset Seizures. *China Africa Research Initiative Policy Brief 47*. School of Advanced International Studies, Johns Hopkins University, Washington, DC.
- Brautigam, Deborah, Yufan Huang, and Kevin Acker. 2020. Risky Business: New Data on Chinese Loans and Africa's Debt Problem. *China Africa Research Initiative Briefing Paper 3*. School of Advanced International Studies, Johns Hopkins University, Washington, DC.
- Buchheit, Lee C. and G. Mitu Gulati. 2010. Responsible Sovereign Lending and Borrowing. *United Nations Conference on Trade and Development Discussion Papers 198* (April).
- Brown, William Adams and Redvers Opie. 1953. *American Foreign Assistance*. Washington, DC: The Brookings Institution.
- Cassard, Marcel and David Folkerts-Landau. 1997. Sovereign Debt: Managing the Risks. *Finance & Development* (December).
- Chung, Kay and Michael G. Papaioannou. 2020. Do Enhanced Collective Action Clauses Affect Sovereign Borrowing Costs? *IMF Working Paper WP/20/162*. International Monetary Fund, Washington, DC.
- Clifford Chance LLP. No date. *An Introduction to Loan Finance*.
- Common Terms Agreement among CP Achiras SAU; Inter-American Investment Corporation; Inter-American Investment Corporation, acting as agent for the Inter-American Development Bank; Inter-American Investment Corporation, as agent acting on behalf of the Inter-American Development Bank, in its capacity as administrator of the Canadian Climate Fund for the Private Sector in the Americas; and International Finance Corporation. 2018.
- Constitution of India of 1949, with amendments as of November 2021.
- Constitution of Kenya, revised edition 2010.
- Constitution of the Republic of Ghana 1992.
- Farquharson, Edward et al. 2011. *How to Engage with the Private Sector in Public-Private Partnerships in Emerging Markets*. Washington, DC: International Bank for Reconstruction and Development and World Bank.

- Fernandes, Jonathan. Sovereign Immunity: State Immunity from Adjudication and Enforcement. Practical Law UK.
- German Constitutional Court (Bundesverfassungsgericht). 2007. Order of the Second Senate—2BvM 1-5/03, 1, 2/06, May 8.
- Gurara, Daniel, Andrea Presbitero, and Miguel Sarmiento. 2018. Borrowing Costs and the Role of Multilateral Development Banks: Evidence from Cross-Border Syndicated Bank Lending. IMF Working Paper WP/18/263 (December). International Monetary Fund, Washington, DC.
- Hall, Peter. Taking Security. Practical Law UK Practice Note Overview 2-107-4032.
- Hong Kong Institute of Certified Public Accountants. 2020. Alert: Updates on Financial Reporting, Auditing and Ethics 31.
- Hull No. J34 Credit Agreement. 2016.
- International Monetary Fund and World Bank. 2001. Guidelines for Public Debt Management. Washington, DC.
- International Monetary Fund. 2013. Public Sector Debt Statistics: Guide for Compilers and Users. Washington, DC.
- Kearse, Nicole. 2020. Understanding the Implications of the Negative Pledge Clause on Sovereign Borrowers. African Legal Support Facility Blog (February).
- Kim, Michael. 2016. Pursuing Protected Assets of Sovereign Award Debtors. ASA Conference. January 22.
- Kramer, Adam. QC, Contracts: Waiver. Practical Law UK Practice Note 0-502-8838.
- Landry, David. 2018. Comparing the Determinants of Western and Chinese Development Finance Flows to Africa. China Africa Research Initiative Working Paper 21 (November). School of Advanced International Studies, Johns Hopkins University, Washington, DC.
- Limited Waiver and First Amendment to Credit Agreement and Termination of Revolving Commitments. 2012.
- Loan Agreement between Capital City of Podgorica and International Finance Corporation. 2017.
- Lombard North Central Plc v European Skyjets Ltd. 2022. EWHC 728 (QB).
- Lui, Kanyi and Yunnan Chen. 2021. The Evolution of China's Lending Practices on the Belt and Road. ODI Emerging Analysis. London: ODI.
- Lui, Kanyi. 2020. Chinese Financing: Banking with Chinese Lender. Pinsent Masons. August 13.
- Lui, Kanyi. 2020. Chinese Financing: How Will China Restructure Zero-Interest Loans? Pinsent Masons. August 13.
- Magnusson, Tomas. 1999. Sovereign Financial Guarantees.
- Magnusson, Tomas. 1999. Legal Arrangements for a Debt Office.
- Magnusson, Tomas. 2001. The Institutional and Legal Base for Effective Debt Management. UNCTAD debt management conference, 3–6 December 2001.
- Master Loan Agreement between Banco de Galicia y Buenos Aires SA and International Finance Corporation. 2016.

- Megliani, Mauro. 2015. *Sovereign Debt: Genesis—Restructuring—Litigation*. Heidelberg: Springer Cham.
- Ministry of Finance, People’s Republic of China. 2019. *Debt Sustainability Framework for Participating Countries of the Belt and Road Initiative*. April 25.
- Morais, Herbert. 1998. *Legal Framework for Dealing with Sovereign Debt Defaults*. In *Current Legal Issues Affecting Central Banks*, volume 5, edited by R. Effros. Washington, DC: International Monetary Fund.
- Morris, Scott, Brad Parks, and Alysha Gardner. 2020. *Chinese and World Bank Lending Terms: A Systematic Comparison Across 157 Countries and 15 Years*. Center for Global Development Policy Paper 170 (April).
- Sloan, Alfred P. Jr. 1963. *My Years with General Motors*. Place of publication: Publisher.
- Practical Law Finance. *Guarantees and Indemnities*. Practical Law UK Practice Note Overview 9-200-1437.
- Practical Law Finance. *Interest Rate Benchmark Reform: Loan Markets*. Practical Law UK Practice Note 4-521-7144.
- Practical Law Finance. *Facility Agreement*. Practical Law Practice Note Overview 8-381-0296.
- Practical Law Finance. *Negative Pledges in Loan Transactions*. Practical Law UK Practice Note w-006-7245.
- Practical Law Tax. *Withholding Tax*. Practical Law UK Practice Note 5-201-9175.
- Public Debt Management Act of Sierra Leone, 2011.
- Public Debt Management Act of Zimbabwe, 2015.
- Public Financial Management Act of Ghana, 2016.
- Public Finance Management Act of Kenya, revised edition 2019.
- Public Finance Act of the Republic of Gambia, 2014.
- Republic of Argentina v. NML Capital, Ltd. 134 S. Ct. 2250 (2014).
- Wheeler, Graeme. 2004. *Sound Practice in Government Debt Management*. Washington, DC: World Bank.
- United Nations. 1958. *Convention on the Recognition and Enforcement of Foreign Arbitral Awards*. New York.
- United Nations Conference on Trade and Development (UNCTAD). 2012. *Principles on Promoting Responsible Sovereign Lending and Borrowing*. Geneva.
- United States Government. 1948. *Economic Cooperation Act of 1948*. Washington, DC.
- USD 150,000,000 Loan Agreement. 2015.
- Van Dyk, Jurg. 2020. *Power Purchase: Africa’s Shift to Take-and-Pay Clauses*. Pinsent Masons (July 31).
- Vienna Convention on Succession of States in Respect of State Property, Archives and Debts 1978.
- White & Case LLP and the School of International Arbitration, Queen Mary University of London. 2021. *2021 International Arbitration Survey: Adapting Arbitration to a Changing World*. London.

World Bank. 2007. *Managing Public Debt, from Diagnostics to Reform Implementation*. Washington, DC.

World Bank. 2008. *Debt Management Performance Assessment (DeMPA) Tool*. Washington, DC.

World Bank. 2009. *Debt Management Performance Assessment (DeMPA) Guide*. Washington, DC.

World Bank. 2017. *Revised IBRD and IDA General Conditions* (June).

World Bank. 2020. *Collateralized Transactions: Key Considerations for Public Lenders and Borrowers* (January).

World Bank and International Monetary Fund (IMF). 2014. *Revised Guidelines for Public Debt Management*. IMF Policy Paper (April 1). Washington, DC.

Zatar, Mahran. 2014. *Pitfalls of Public Private Partnership in Toll Roads*. MSc thesis, University of Texas, Arlington.

Chapter 9

Debt Accounting, Reporting and Disclosure

M. Coşkun Cangöz

Abstract

Accounting, recording and reporting are core functions of debt management. However, significant differences exist across countries regarding recognizing debt transactions and contingent liabilities and their proper disclosure. International standards of accounting and statistics set the principles and minimum reporting requirements. Debt transparency, supported by sound accounting and recording practices, is key for decision-making and accountability and reduces the cost of funding and the risk of fraud. Information technology infrastructure and its effective use have proven essential in performing debt operations as debt levels and the complexity of instruments continue to increase. Accordingly, debt management offices face heightened operational risks, and business continuity plans have become a must. Overall, a well-established accounting, recording and reporting framework enables debt managers to exercise accountability to legislatures and the public through independent external audits and disclosed audit reports.

9.1. Introduction

Public debt management is the process of establishing and executing a strategy to raise the required amount of funds at the lowest possible cost over the medium to long run, with a prudent degree of risk (International Monetary Fund [IMF] and World Bank 2014). A significant part of the process is recording, monitoring, accounting and reporting: all part of the so-called back-office operations. Information technology infrastructure and the effective use of technology are essential in performing these functions. The whole process is associated with operational risk and subject to auditing.

The chapter summarizes the explanation of the back-office function and other complementary and related activities. The next two sections of the chapter introduce accounting, monitoring and reporting of public debt. Section 4 covers the same topics but for contingent liabilities. Section 5 briefly discusses the main functions of a debt management information system and its integration with the fiscal management system. Section 6 focuses on operational risk management and business continuity plans. The last section describes different types of auditing and their application to public debt.

9.2. Accounting, Recording and Monitoring of Public Debt

Accounting stands at the core of fiscal management as it creates a platform for the functioning of the budget cycle. The first step of the process, **macroeconomic forecasting**, calculates revenues, expenditures, deficits and financing needs over time. The step is an exercise full of assumptions about the behavior of variables such as economic growth, commodity prices and tax rates. The assumptions are collectively known as the **macroeconomic framework**. It provides the basis for the second step, **budget preparation**, which includes the collection and analysis of expenditure proposals and revenue forecasts and their consolidation into the budget document, which puts forward the government's policy objectives. The third step is **budget execution**, which refers to procuring goods and services and collecting revenues. The fourth, **cash management**, is associated with the release of funds to spending agencies at the right time, which, in turn, calls for cash-flow forecasting, centralized bank accounts and short-term financing instruments. Formulating and implementing a medium- to long-term debt strategy and maintaining the related debt portfolio—jointly called **debt management**—are the fifth step. Each step involves transactions that need to be recorded, monitored and, eventually, validated, which makes **accounting and reporting** central to the overall cycle (Figure 9.1).

Figure 9.1. Role of Accounting in Fiscal Management

Source: Author.

The recognition of transactions and their reporting may differ across countries, depending on the accounting system used in their public sectors. Accounting systems range from **cash basis** to **accrual basis** and modified versions thereof. Cash-based accounting recognizes revenues and expenditures only when a cash flow occurs. Accrued revenues and expenditures, and transactions such as government guarantees remain outside public accounts and reports. In accrual accounting, transactions are recorded, whether or not the cash flows occurred. The system ensures that assets and liabilities, including accrued revenues and expenditures, and financial operations, including guarantees and derivatives, can be tracked and measured when the related economic value is created. To supplement accrual accounting, authors such as Irwin (2012) suggest using **extended accounts** to include the net present value of all projected future cash flows.

Since public accounting and reporting systems vary from jurisdiction to jurisdiction, the International Public Sector Accounting Standards Board (IPSASB), facilitated by the International Federation of Accountants, develops accounting standards and guidance for public sector use. IPSASB defines standards based only on cash and accrual basis accounting but not on the modified cash or modified accrual basis.

International Public Sector Accounting Standards (IPSAS) do not specifically define debt or net debt but include comprehensive financial instruments standards: IPSAS 5, Borrowing Costs; IPSAS 15, Financial Instruments: Disclosure and Presentations (introduced in December 2001 and applied until replaced with IPSAS 28 in January 2010); IPSAS 28, Financial Instruments: Presentation; IPSAS 30, Financial Instruments: Disclosures; and IPSAS 41, Financial Instruments. According to IPSAS 41, financial liabilities, which include loans and debt securities, are measured initially at fair value with the subsequent measurement at amortized cost using the effective interest method. Concessionary loans are recognized at fair value, with the difference accounted for between the transaction price and fair value. Financial liabilities are derecognized when the obligation is settled through payment or assumed by a third party or the terms and conditions of the arrangement are substantially modified (Box 9.1).

Box 9.1. Türkiye: Setting Public Sector Accounting Standards in Debt Management

Following the 2001 economic crisis in Türkiye, the government initiated several reforms, including in public financial management and debt management. In 2006, Law No. 5018 Public Financial Management and Control introduced the Government Accounting Standards Board (GASB) at the Ministry of Finance. The board consists of nine members, one representing the unit that manages public debt.

Since its establishment, the GASB has published 30 public accounting standards based on International Public Sector Accounting Standards (IPSAS). All the debt-related standards of IPSAS were translated and adopted: IPSAS 5, Borrowing Cost; IPSAS 28, Financial Instruments: Presentation; IPSAS 29, Financial Instruments: Recognition and Measurement; and IPSAS 30, Financial Instruments: Disclosures.

Türkiye uses a modified accrual accounting system. Budget revenues and expenditures are recorded on a cash basis, while other activities, assets and liabilities are recorded on an accrual basis. The adoption of accrual accounting enabled the debt management office to record the accrued interest of government debt and produce statistical debt data based on accounting records.

Source: Author.

The IMF has contributed to the emergence of a standard accounting system for public debt. As a collector of international macroeconomic data, the IMF has set accounting principles for compiling public debt statistics. The IMF (2011, 2014) defines key accounting principles as follows:

1. **Residency of the debtor and creditor.** Residence is not based on nationality or legal criteria but refers to the economic territory with which each institutional unit has the strongest connection. In the case of domestic debt, the resident public institution borrows from where it resides. If it borrows from creditors residing in territories other than where the borrower resides, the liability is recorded as external debt.
2. **Time of recording.** Flows and stock positions are recorded when economic value is created, transformed, exchanged, transferred or extinguished. In cash basis accounting, the time of recording relates to the timing of cash flows and, in accrual accounting, to the timing of the event, including nonmonetary transactions.
3. **Valuation of debt instruments.** Cash accounting, accrual accounting and macroeconomic statistics guidelines agree that non-traded debt instruments are valued by their nominal value, given the absence of market value (Table 9.1).¹¹⁸ As for traded debt instruments, cash accounting suggests nominal value, while historic cost or fair value is used in accrual accounting.¹¹⁹ Macroeconomic statistics guidelines require the valuation of traded instruments at nominal and market value when markets are illiquid and price quotations are not feasible for fair valuation.

¹¹⁸ Market prices for transactions are defined as money that willing buyers pay to acquire something from willing sellers. The exchanges are made between independent parties and based on commercial considerations only. The nominal value of a debt instrument is a measure of value from the debtor's viewpoint: It is the amount that the debtor owes to the creditor at any moment in time.

¹¹⁹ IPSAS defines "fair value" as the amount for which a liability is settled. Fair value is not less than the amount payable on demand, discounted from the first date that the amount could be required to be paid.

Table 9.1. Valuation of Debt Instruments

	OECD Countries	Non-OECD Countries
Nominal value	Australia, Canada, Colombia, Denmark, Greece, Israel, Korea, Mexico, Norway, Sweden, Türkiye	Albania, Argentina, Armenia, Barbados, Brazil, Bulgaria, China, Costa Rica, DRC Congo, EL Salvador, Guatemala, Honduras, Indonesia, Kazakhstan, Lithuania, Madagascar, Malta, Moldova, Morocco, Nepal, Nicaragua, Nigeria, Pakistan, Philippines, Seychelles, South Africa, Sri Lanka, St Lucia, Suriname, Tonga, Uganda
Face value	Austria, Belgium, Chile, Czech, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Luxembourg, Netherlands, Poland, Portugal, Slovak Rep., Slovenia, Spain, Switzerland, U.K.	Albania, Dominican Rep., Kenya, Malawi, Mauritius, Paraguay, Peru, Romania, Tanzania, Uganda
Book value	Canada, Sweden, U.S.A.	
Fair value	New Zealand	
Market value	Japan, Sweden	Armenia, Bangladesh, Georgia, Kazakhstan, Lebanon, Moldova, Morocco

Source: Organisation for Economic Co-operation and Development (no date).

- 1. Unit of account (currency).** Domestic currency is the reference unit in public debt accounting. Liabilities in foreign currency, such as external debt and, in some cases, foreign currency-denominated domestic debt, must be converted to local currency with the most appropriate exchange rate. Accounting principles suggest the midpoint between buying and selling rates to convert liabilities denominated in foreign currencies. Special drawing rights, similar currency units issued by international organizations and precious metals such as gold are considered foreign currency.
- 2. Maturity of debt instruments.** The maturity of a debt instrument refers to the time when it is fully repaid as agreed by the debtor and the creditor (IMF 2011). A debt instrument can be either short or long term. Short-term instruments have a maturity of up to one year, while long-term ones have a maturity of over one year. Maturity may be calculated starting from the date of debt issuance (original maturity) or from a reference date (remaining maturity) to the last scheduled payment date of the loan or security.
- 3. Consolidation.** Securities and loans issued by the government and held as assets on the balance sheet of another public entity have to be consolidated on a net basis as the securities and loans do not exist. Consolidation may be necessary within a particular public subsector or between public subsectors.

Governments that have transitioned from cash to accrual accounting have improved their monitoring and reporting of public debt and developed a comprehensive balance sheet of their assets and liabilities valued by international standards (Cavanagh et al. 2016). The reason is that accrual accounting enables governments to determine and monitor their net worth and to manage balance sheets by assessing the potential return on assets, costs on liabilities and mitigation of risks associated with both. Following the global financial crisis of 2008, many countries extended the coverage of fiscal accounting and produced public sector balance

sheets. According to the IMF Public Sector Balance Sheet Database, 38 countries had published balance sheet data for their entire public sectors as of 2016.

Despite the progress, accounting, recording and monitoring of public debt still need to be improved, especially in low-income and developing countries (Cavanagh et al. 2016). Based on the World Bank's debt management assessments of 17 low- and lower-middle-income countries in 2015-2017, 41% did not meet minimum completeness and timeliness requirements for recording and monitoring public debt (IMF and World Bank 2018).

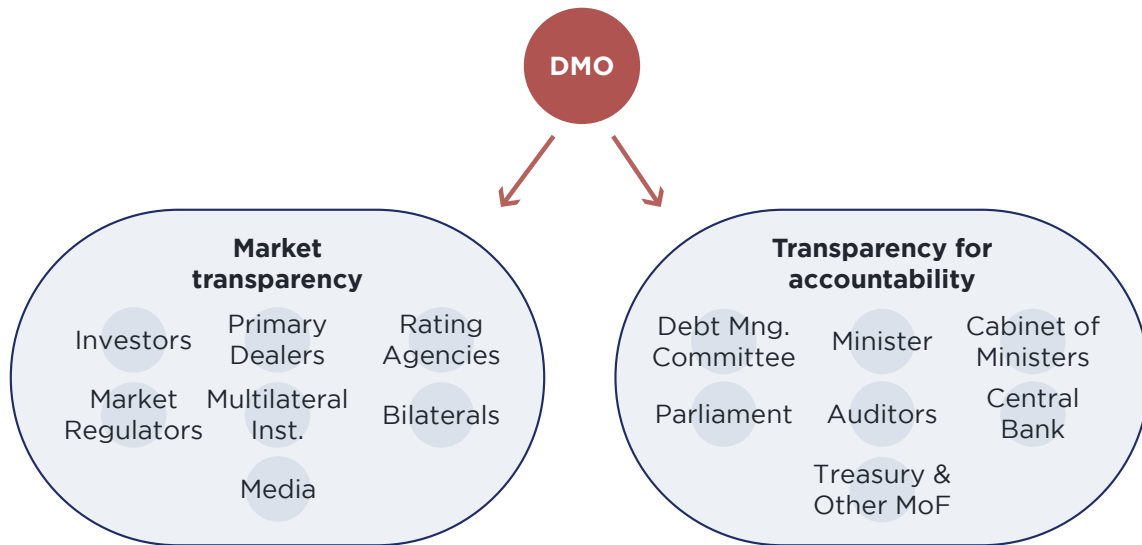
The weaknesses may include the fact that recording and monitoring call for lots of institutional coordination and are more complicated than they sound. Recording debt instruments refers to entering information about debt transactions into a database. The process includes registration of new transactions with their descriptions (lender and user information, International Securities Identification Number and so on), financial terms (interest rate, currency, maturity, concessions, nominal amount, among others) and disbursement and payment projections. Usually, the borrowing unit (the DMO front office) initially registers the debt transactions. Monitoring starts after the validation of registered information by the payment and settlement unit (the back office). Since benchmark issuances have become common in developing the domestic market, reissue and buyback transactions have increased significantly. The front office must consider accrued interest for the reissue and early payment of securities.

Monitoring means controlling and tracking stocks and flows of debt instruments by checking with creditors and clearing houses. Monitoring techniques depend on the types and financial terms of debt instruments. Loans and securities have different characteristics and payment conditions. Loans may differ depending on the terms and conditions offered by the creditor. Financial data and debt information must be accurate, and monitoring requires close coordination with the disbursement units and the settlement agency.

9.3. Reporting and Disclosure of Public Debt

Reporting is a critical function of debt management. Reporting enables effective process running and decision-making, strengthens accountability and enhances credibility, predictability and transparency. Good accounting, recording and monitoring provide valuable information to government entities and external stakeholders, including investors, creditors, multilaterals and the public.

From a DMO's perspective, disseminating reliable, accurate and timely debt information is the way to comply with legislation, contracts, institutional requests and, ultimately, stakeholder expectations. Debt reports may serve a wide spectrum of entities but achieve two main objectives: transparent public sector governance and efficient financial markets (Figure 9.2).

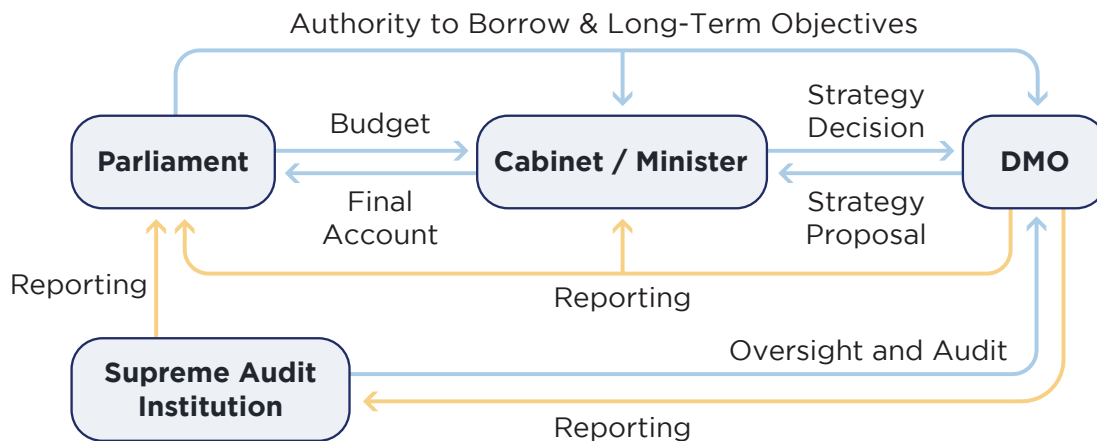
Figure 9.2. Spectrum of Debt Reporting

DMO = debt management office, inst. = institution, mng. = management, MoF = ministry of finance.

Source: Adapted from Currie (2014).

Primary legislation mainly refers to laws, typically sets the objectives of debt management, authorizes executive entities to borrow and requires periodic reporting and disclosure of debt information. Reporting to the legislature, the cabinet and relevant ministers and the supreme audit institution (SAI) as representative of parliament is central to DMOs' governance and accountability. Reports include financial and statistical information, presentations, notifications and ad hoc reports. DMOs produce analytical studies while preparing debt management strategies and submit them to the executive body. Most DMOs publish their debt management strategies and annual borrowing plans and report to the legislature and the executive on the performance of their debt management and evaluation of debt operations. The SAI performs oversight and auditing functions on behalf of the legislature. The DMO prepares reports that meet the needs of the SAI for financial and performance auditing (Figure 9.3).

DMOs share information with market representatives to develop debt markets, reduce uncertainty among investors, avoid information asymmetry, lower transaction costs, encourage greater investor participation and, as an outcome, reduce debt-servicing costs. DMOs indirectly report through international finance institutions and rating agencies and share debt data that will be disclosed in the recipients' publications or websites.

Figure 9.3. Accountability in the Governance Framework of Public Debt Management

DMO = debt management office.

Source: Author.

DMOs disclose debt information mainly through debt management reports and statistical bulletins (see those of Ethiopia, Ghana and Türkiye, among many others). The World Bank's performance diagnostic tool, Debt Management Performance Assessment (DeMPA), calls for at least the annual publication of the volume and composition of debt stock, the maturity profile of flows and cost measures such as implied interest rate. The World Bank (2021) suggests disclosure of risk indicators, including average time to refixing, average time to maturity and similar risk measures to capture the quality of the debt structure. Higher frequency and granularity of disclosed information indicate higher transparency.

IMF and World Bank guidelines (2014) require disclosure not only of statistics on the debt portfolio and the primary and secondary markets but also objectives of debt management and publication of debt management strategies and external audit reports. DMOs publish debt statistics usually quarterly, semiannually and annually (Box 9.2).

In recent years, debt transparency has moved to the center of the international development agenda. Enhanced debt transparency has been integrated into World Bank policies and operations to reduce debt vulnerabilities, and the institution is working on key principles for achieving full debt transparency. Since 2017, a series of initiatives have been introduced, such as the endorsement of "G20 Operational Guidelines for Sustainable Financing," adoption of the Organisation for Economic Co-operation and Development (OECD) "Recommendations on Sustainable Lending Practices and Officially Supported Export Credits" by the Ministerial Council, publication of the "Voluntary Principles for Debt Transparency" for the private sector by the Institute of International Finance (IIF), development of a commercial debt data repository and reporting platform by the OECD (Rivetti 2021) and publication of the IIF's Best Practices for Investor Relations to timely disseminate key data related to central government debt.

Box 9.2. France: Ensuring Debt Transparency

Agence France Trésor (AFT) manages the state's debt in the taxpayers' best interest while maintaining full transparency. The objectives of debt transparency are to (1) inform investors about the auction calendar and results, (2) report AFT's work and assignments to the financial community and media, (3) disseminate information on debt management, (4) promote AFT and French sovereign bonds and (5) answer questions from the public and other non-targeted audiences.

AFT publishes auction results, a monthly bulletin and the annual report on its website and circulates them by email to subscribers. The annual report and monthly bulletins are published in seven languages to serve the diverse investor base.

The monthly bulletins and website include general debt-related data (auction schedule, debt detention, outstanding debt), secondary market data (yield curve, total stripping and reconstitution), negotiable government debt data (details of short-, medium- and long-term debt at the end of the month) and information on the French economy and international comparisons (economic indicators, government budget position, general government debt and so on).

The annual report includes the annual performance of the state debt and cash management and trading account: records of all transactions linked to managing the government's debt, cash holdings and statistics about medium- and long-term debt, government borrowing and short-term debt.

AFT has an internal charter that defines rules of external communication, including relationships with the media. In practice, as per requests for on-the-record interviews and written reports, the chief executive officer (CEO) and head of communication interface with the minister's office, and only the CEO may be quoted.

Source: Requin (2016).

Debt-related information is key for credit-rating agencies to assess a sovereign's creditworthiness. The agencies provide transparency to the market through independent review and validation, publication of reports and analysis. The three main credit-rating agencies (Standard and Poor's, Moody's Investors Service and Fitch Ratings) use methodologies that contain clear criteria on the quality and consistency of debt data and the transparency of statistics. Rivetti (2021), based on Fitch's methodology, found that if information on external assets and liabilities is lacking, a negative notching adjustment can be made to the external finances section of the qualitative overlay in the credit-rating report. Debt transparency helps reduce not only the cost of funding but also improves a sovereign's creditworthiness.

9.4. Accounting, Recording and Reporting of Contingent Liabilities

Contingent liabilities are recognized differently, depending on the accounting system used. Measuring and reporting contingent liabilities differ in accounting and macroeconomic statistics.

Cash accounting does not recognize contingent liabilities. The expense associated with them is recognized only if the contingent event occurs and payment is made.

In accrual accounting, the expected cost of contractual contingent liabilities is recognized at the moment of initiation if the probability that the contingency will occur—and a payment will have to be made—is more than 50%, and the amount of the obligation can be measured with sufficient precision. However, if the liabilities do not satisfy these criteria, they should not be recognized.

Contingent liabilities are obligations that arise from discrete events that may or may not occur (IMF 2013). In macroeconomic statistics, a contingent liability is only recognized if it is probable that an outflow of resources embodying economic benefits or service potential will be required to settle the obligation or if the obligation amount cannot be measured with sufficient reliability. Governments (e.g., New Zealand) have sometimes disclosed unquantifiable contingent liabilities as a note to financial statements.

In accounting and statistics, contingent liabilities must be measurable for recognition. Given that a contingent liability is an obligation with a probability of occurrence of less than 100%, quantifying the probability is key to measuring its fiscal impact. In principle, the expected value of a quantifiable contingent liability may be estimated as the probability of the underlying event occurring multiplied by the expected magnitude of the fiscal loss (OECD 2013). Countries that charge for guarantees mostly use market value and expected cost measures to price the guarantees (Cebotari 2008). Canada, the Netherlands, New Zealand, Norway and the United States use the net present value of the expected cost of guarantee, while Colombia and Sweden budget the expected annual losses under the guarantee on a cash basis.

As with government debt, potential costs of contingent liabilities should be disclosed to policymakers before they make a decision. If the government does not credibly present the information, other organizations (such as credit-rating agencies) consider the government to be underreporting significant fiscal risks and make their own risk assessments. Undisclosed liabilities may increase risk premiums and legal and reputation issues, as in Mozambique (Box 9.3).

Box 9.3. Mozambique: Undisclosed State-Owned Enterprise Debt

In 2013 and 2014, three state-owned enterprises were created, which borrowed more than USD2 billion (12% of gross domestic product). Almost USD1.3 billion of the debt was undisclosed until international media reported it in 2016. An independent audit report concluded in 2017 documented the lack of due process under Mozambican law and breach of the International Monetary Fund program.

Source: Gebregziabher and Sala (2022).

How contingent liabilities are disclosed depends on the accounting standards and principles of macroeconomic statistics applied. According to IPSAS 19, Provisions, Contingent Liabilities and Contingent Assets, contingent liabilities are not disclosed in cash accounting. In accrual accounting, explicit (contractual) contingent liabilities should be disclosed in the notes to financial statements as long as the possibility of payment is not remote. In statistical reporting, disclosing an explicit contingent liability requires materialization – the event must happen.

Countries, particularly those using accrual accounting, disclose contingent liabilities in financial statements. According to an OECD survey, 60% of the participating countries include contingent liability information in budget documents. A few countries produce comprehensive fiscal risk statements that include contingent liabilities (Ülgenturk 2017).

Countries may prefer to publish contingent liabilities in debt management reports, fiscal risk reports, or other reports (Table 9.2). Australia publishes the Statement of Risks in the State Budget, the UK Office for Budget Responsibility publishes the Fiscal Risks Report, and New Zealand publishes the Statement of Contingent Liabilities and Contingent Assets in the Crown Financial Statements.

Table 9.2. Disclosure Practices of Contingent Liabilities in Selected Countries

Country	Disclosure practices
Canada	Outstanding credit guarantees are published annually in the Public Accounts of Canada prepared by the Receiver General of Canada. This document is available to the public
Mexico	The DMO has the mandate to issue a quarterly report for the congress where it describes the general status of public debt. As part of such mandate, all explicit contingent liabilities backed by the Federal Government have to be duly described in a specific section. All contingent liabilities are reported at notional value rather than expected value.
Spain	Credit guarantees are recorded in the central government accounting system in specific accounts. All contingent liabilities linked to a specific guarantee are recorded. Bank of Spain and Ministry of Finance are informed monthly of the amounts and status of each guarantee. Parliament is informed on a quarterly basis. Public data on GGBs are available at the Treasury web site (weekly updated). Besides, Bank of Spain publishes monthly State guarantees data at aggregate level.
South Africa	The information with regard to contingent liabilities is published annually in the budget review.
Türkiye	The monthly "Public Debt Management Report" contains data related to public debt including Treasury guarantees, guaranteed debt stock, called guarantees, balance of Risk Account (contingency account), on-lent external loans, financial receivables and overdues. The report has been published on the Ministry's website (www.hmb.gov.tr) and its descriptive version has been published on annual basis.

Source: Ülgenturk (2017).

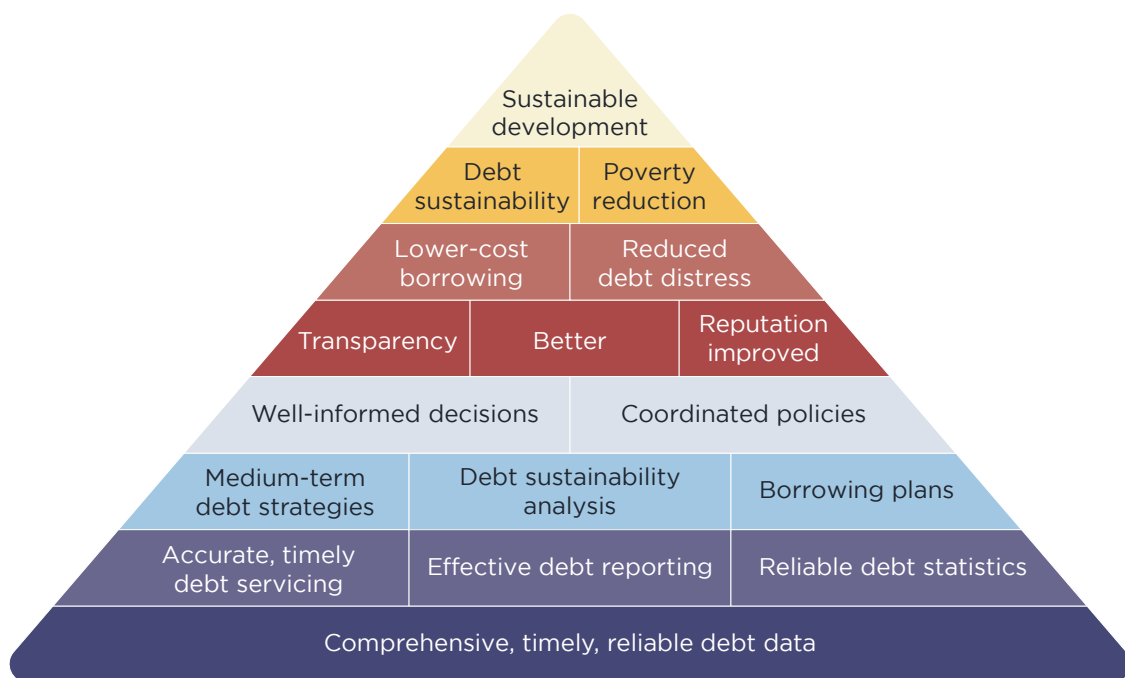
Implicit contingent liabilities are important but included only in fiscal risk analysis and are not disclosed in most countries. Countries sometimes do not publish information on contingent liabilities if it would substantially prejudice the countries' economic interests, security or international relationships. IPSAS 19 allows nondisclosure of contingent liabilities if the government might suffer a loss of value in litigation or negotiation otherwise.

9.5. Debt Management Information System

Lack of access to comprehensive, timely and reliable debt data can cause significant difficulties for a government, such as the risk of technical default and unsustainable debt profiles. A debt management information system (DMIS) provides a solution. Recording all contracted public debt in the DMIS on an individual loan basis enables debt managers to service debt effectively and enhance reporting and statistics

production capacity. The DMIS is central to decision-making because it provides debt service projections, basic cost and risk indicators, and a basis to estimate the impact of sudden changes in interest rates, exchange rates and other financial shocks. The real-time availability of reliable, comprehensive and timely debt data empowers transparency, reduces the costs of borrowing and the probability of debt distress and, ultimately, contributes to sustainable development as long as policymakers make the necessary decisions to achieve these goals (Figure 9.4).

Figure 9.4. Importance of Comprehensive, Timely and Reliable Debt Data



Source: United Nations Conference on Trade and Development (2021).

A good DMIS must support any debt or debt service transaction for external or domestic debt instruments. At the very least, it must be able to handle debt securities and loans. The core functions of a DMIS are (1) recording, validating and maintaining data, (2) producing payment projections and (3) generating reports for analysis and decision (Aslan et al. 2018). Additional functions include (1) conduct of portfolio and risk analysis, (2) planning of future borrowings, (3) resource mobilization, (4) connectivity with the financial management information systems and (5) straight-through processing (Aslan et al. 2018).¹²⁰

The expected outputs of a well-functioning DMIS are as follows (IMF and World Bank 2018):

1. Instrument by instrument financial terms repository.

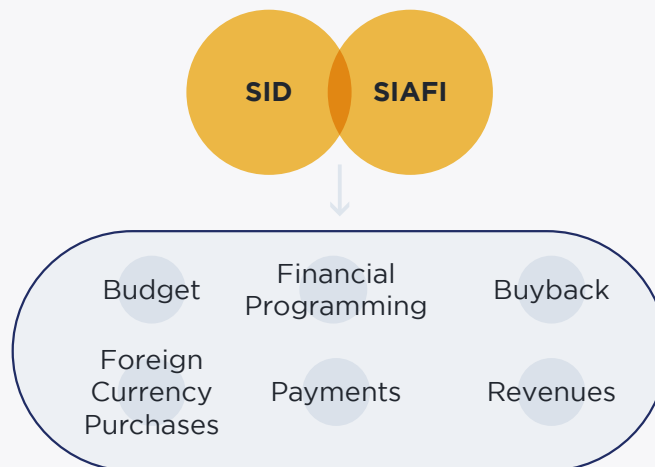
¹²⁰ An automated process that eliminates manual interventions and allows transactions to be done by electronic systems.

2. An accurate breakdown of outstanding debt by various characteristics, including currency composition, creditor category and residency, concessions and instrument composition (including interest rate type).
3. Aggregate debt-servicing schedules across various categories of debt.
4. Basic portfolio indicators, such as average maturity and proportion of foreign currency debt.
5. Payment schedules for interest and amortization of individual loans and securities, along with the functionality of generating associated payment notices.

As with other software used in the public sector, the DMIS has to be equipped with system security, data protection and access control functions. Security controls and protocols that personalize access to information are important to mitigate human error and data loss (Aslan et al. 2018). The DMIS should meet industry-standard internal control, audit and regulatory requirements and be able to produce audit trails.

Box 9.4. Brazil: Integrated Public Debt System

In the early 2000s, the Debt Management Office in Brazil used four structured systems, five databases and roughly 130 spreadsheets. To mitigate operational errors and failures and increase efficiency and transparency, an in-house debt management information system was developed to unify all existing systems and databases. The Integrated Public Debt System included recording, controlling, reporting, analytics, budgeting and forecasting functions. The new system was designed to be integrated with the Integrated System of Financial Administration and other systems: Custody, Settlement and Stock Exchange, Central Bank System and Special System of Settlement and Custody.



SIAFI = Integrated System of Financial Administration, SID = Integrated Public Debt System.

Source: Proite (2017).

The DMIS is a critical component of overall public financial management and needs to be linked and interact with many other systems. A good DMIS should be able to produce and exchange (1) estimates of loan disbursements and bonds proceeds, (2) estimates of budgetary revenues allocated for debt, (3) budget releases for debt payments, (4) debt service forecasts, (5) recordings of financial transactions, (6)

reconciliation of debt records and (7) debt reports consistent with financial and/or accounting records for a higher score in DeMPA assessments (World Bank 2021). A DMIS should be able to interact with other financial systems and applications used for payment, the central securities depository, auctions, contingent liabilities, aid, and budget planning, execution and monitoring.

Full integration is rare, but country experiences (Box 9.4) indicate that integration of the DMIS, even as a satellite of financial management information systems or through the interface, would lead to (1) reduced operational costs, (2) easier reconciliation of debt data, (3) improved reporting and transparency, (4) better coordination with the budget process, (5) efficiency in determining financing needs, (6) enhanced support to decision-making and (7) operational risk management and the development of business continuity plans (Dener et al. 2011).

9.6. Operational Risk Management

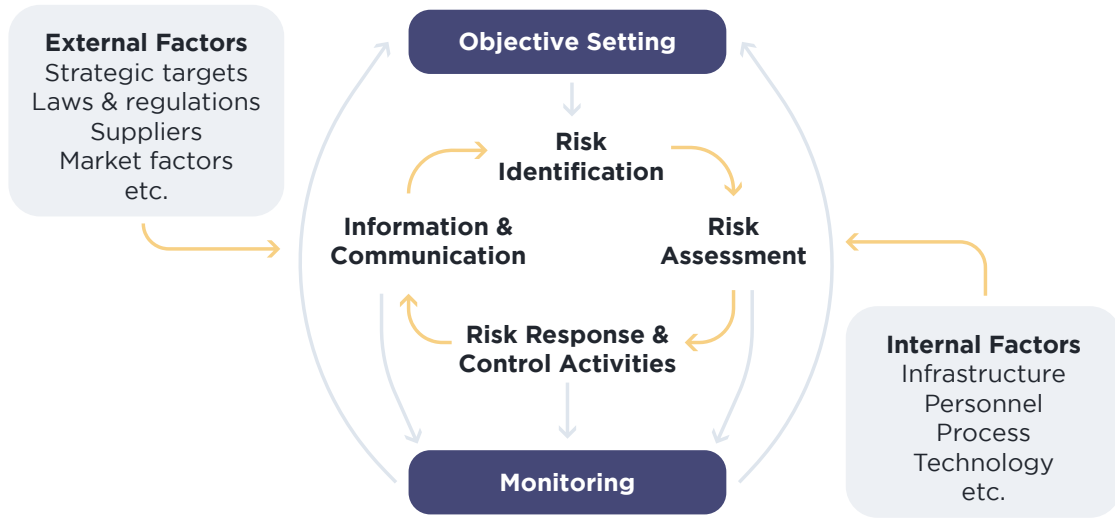
Disruptions in the provision of funds required by the government and in fulfilling its payment obligations may have irreparable consequences. Since the functions are highly transactional, incidents are almost unavoidable unless operational risks are properly managed.

The Bank for International Settlements (BIS) defines operational risk as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. The BIS definition does not cover reputational risks that may arise from operational failures (Magnusson et al. 2010, Tokaç and Williams 2013). However, operational errors and failures may result in potentially severe reputational and political damage to the DMO's perceived competence (Storkey 2011).

Six categories of operational risk that are relevant for public debt management: (1) infrastructure and technology failures, (2) failures to access premises, (3) failures of key service providers, (4) staff- and management-related failures, (5) failures to meet statutory, legal and other obligations and (6) natural disasters (Magnusson et al. 2010). The sources of risk can be internal or external, and the policies to mitigate them vary. But establishing an effective operational risk management framework starts with a holistic approach where all possible risks are mapped out, policies and procedures are "owned" by senior management, and roles and responsibilities are clearly identified (Figure 9.5).

Usually, the execution of operational risk policy begins by identifying and classifying risks using a matrix to assess the probability of each risk and its potential impact on reputation, financial costs and budget (Figure 9.6). The matrix is then compared with the risk tolerance levels of the DMO (Magnusson et al. 2010). A 4x4 matrix is the most common tool, but 3x3 or 5x5 matrixes are also used. The focus is on the areas highlighted in red. This approach helps debt managers assemble a risk management strategy based on clear objectives, functions and procedures.

Figure 9.5. Processes of Operational Risk Management



Source: Tokaç and Williams (2013).

Figure 9.6. Operational Risk Exposure Matrix

	Low Impact	Medium Impact	High Impact	Very-High Impact
Very-High Probability (almost certain)	VHpLi	VHpMi	VHpHi	VHpVHi
High Probability (probable)	HpLi	HpMi	HpHi	HpVHi
Medium Probability (possible)	MpLi	MpMi	MpHi	MpVHi
Low Probability (remote)	LpLi	LpMi	LpHi	LpVHi

Source: Magnusson et al. (2010).

Box 9.5. Australia: Predictability of Operational Risks

The operational effectiveness of a debt management office is an outcome of its ability to include all types of operations, processes and functions in its operational risk management framework. However, a debt management office, like other organizations, may not be able to foresee a prolonged period during which traditional business conditions do not apply. The coronavirus disease (COVID-19) pandemic presented a major challenge to cash and debt management operations, but only a few countries made provision for such an event.

The Australian Office of Financial Management (AOFM) has been an exception, given that it has a comprehensive business continuity plan to ensure that its critical functions continue in the event of a major disruption or the outbreak of a pandemic. The arrangements include the provision of a full backup of information technology and related business services in case the AOFM’s day-to-day business systems or office accommodations cannot be used or when AOFM staff are not available to perform critical tasks.

Source: AOFM (2016).

As a subset of the operational risk management framework, the business continuity plan ensures that the core operations of the DMO are not affected by business- and environment-related disruptions generally not under its control. The COVID-19 pandemic demonstrated that business continuity must cover the DMO's critical functions and activities (Balibek et. al. 2021). Ultimately, the idea is to establish a business continuity plan that limits potential losses by concentrating on risks that could impact core functions and designing risk mitigation and recovery strategies.

The business continuity plan is distinct from the management of market risk. The plan aims to absorb the risk and lay out a path to recovery from the impact rather than to transfer and/or contain risk from financial positions. The plan is a series of coordinated and agreed actions to respond immediately to an event. It is organized into six iterative phases: (1) policy and program management, (2) embedding of business continuity into the organization's culture, (3) analysis, (4) design, (5) implementation and (6) validation (Business Continuity Institute 2013).

Once the operational risk framework, including the business continuity plan, is established, monitoring it through regular reporting and running scenarios and simulated live tests is critical. The precautions improve the quality of the proposed mitigation actions and increase the likelihood of taking them if a risk materializes.

9.7. Auditing of Public Debt

As the last phase of the budget cycle, auditing closes the loop of the control environment by providing input to improve operational efficiency. In most countries, debt management is audited in two ways with different objectives. External audits, performed mainly by the SAI, refer to the independent examination of government financial statements to ensure compliance with accounting standards, laws and regulations. Internal audits examine and evaluate the DMO's internal controls, governance and operations.

In most countries, the SAI, on behalf of the legislature, controls and audits the use of the borrowing power delegated to the executive (Figure 9.3). Since debt transactions can be complex and technical, and a significant part of public debt operations may not be disclosed, external audit reports provide reliable and timely information to the legislature and the public. Investors are interested in external audit reports as they provide independent opinions that can be used in assessing creditworthiness. Considering the pivotal role of external auditing, the DeMPA suggests that the national audit body should periodically examine debt transactions to evaluate the accuracy of the government's financial statements and check that the DMO has complied with regulations (World Bank 2021). Public disclosure of audit reports is considered essential for public debt accountability and transparency.

Box 9.6. New Zealand: Performance Audit

The performance audit helps enhance the effectiveness, efficiency and economy of debt management and strengthens internal control to prevent fraud in public debt activities. The International Standards of Supreme Audit Institutions (ISSAI) standards and guidelines for performance auditing (ISSAI 300) suggest that supreme audit institutions consider performance audits of public debt issues where auditors can provide new knowledge, insights and perspective. Performance audit reports have the potential to influence policymakers and significantly help improve debt management.

In 2007, New Zealand published its first performance audit report on debt management. The Controller and Auditor General has appointed KPMG to undertake a performance audit of the New Zealand Debt Management Office (NZDMO) on their behalf because of the specialist and technical nature of NZDMO's work. The audit examined the effectiveness of the operations of NZDMO, including its governance and policy framework.

The performance audit compared (1) NZDMO's policy framework with the internationally recognized guidelines produced by the Organisation for Economic Co-operation and Development (OECD), the Bank for International Settlements and the International Monetary Fund and (2) NZDMO's operational activities with OECD central government debt statistics, other similar entities such as the Australian state and/or Commonwealth borrowing authorities and similar financial institutions or corporate entities that undertake financial risk management within Australasia.

The report had findings and recommendations on (1) the Crown's balance sheet and the role of NZDMO, (2) assurance mechanisms used for governance, (3) debt management—strategic portfolio, (4) debt management—tactical portfolio, (5) use of derivatives, (6) internal systems and (7) key personnel risk.

Source: Controller and Auditor General (2007).

The external audit may be a compliance, financial or performance audit based on the legal mandate of the auditing institution. A compliance audit determines whether debt transactions are performed in accordance with laws, regulations and contracts. A financial audit examines whether the financial accounts and related reports follow sound accounting principles and explores errors or fraud. A performance audit aims to improve the effectiveness, efficiency and economy of debt operations (Box 9.6). Effectiveness consists of checking the achievement of the debt management strategy objectives and the actual impact of transactions compared with their intended impact (World Bank 2021). However, due to the lack of auditors with sufficient knowledge and experience in debt management, SAIs are sometimes unable to audit borrowing performance. Even in New Zealand—with its highly regarded DMO—the Auditor General contracted external financial market specialists, including from the United States, to cover the lack of in-house financial knowledge.

External audits should be consistent with international standards such as those set by the International Organization of Supreme Audit Institutions (INTOSAI). The standards require the SAI to ensure the following:

1. Audit methodology applied to the subject matter of public debt management.
2. Competent auditors who know audit methodology and public debt auditing.

3. Critical areas of debt management areas included in the audit plans.
4. Independent assurance of the audit quality.

In parallel, an independent external audit body should consider standardized audit steps when auditing debt operations. The steps include planning the audit, developing audit criteria, collecting evidence, drafting the findings, reaching a conclusion and formulating recommendations.

What audit criteria should be used for public debt management? INTOSAI accepts the following as sound practices:

1. Principles on Promoting Responsible Sovereign Lending and Borrowing (United Nations Conference on Trade and Development 2012).
2. Revised Guidelines for Public Debt Management (IMF and World Bank 2014).
3. Debt Management Performance Assessment Methodology (World Bank 2021).

DMOs are expected to produce an action plan to tackle the issues raised by their auditors. The plan should specify the corrective measures to be taken and the time frame in which they will be taken. The plan should be a road map to close nonconformances and explain how similar weaknesses will be prevented.

Conclusion

A well-functioning and reliable accounting, recording and monitoring system is essential for sound debt management. Such a system helps governments produce accurate and complete information on debt portfolios for improved decision-making, accountability and transparency. Accrual-based accounting and fiscal reporting give governments a more comprehensive view of financial performance and the cost of their activities. The adoption of IPSAS brings transparency by enhancing international comparability and quality of information, strengthening accountability by reducing data gaps and increasing efficiency in decision-making and resource allocation.

Better accounting, recording and reporting capacity can lower the risk or uncertainty premium investors require. Improved transparency facilitates their investment decisions and, everything else equal, increases demand for government securities. Transparency in debt management operations and the design of debt instruments can help borrowers reduce transaction costs and the risk of fraud.

Levels of transparency differ across countries. Internationally accepted standards in accounting and fiscal transparency guide public debt managers in providing meaningful information without overwhelming their institutional capacity. However, there is no one-size-fits-all model of transparency, as the structure of debt management, size and sophistication of debt portfolios, and market dynamics and expectations differ from sovereign to sovereign.

Governments employ debt management systems that best fit the sophistication of their financial transactions. Some systems are basic and developed in-house; others are commercially available and fitted with advanced functions. Whatever the system, operational risks abound. A thought-out operational risk management framework and a business continuity plan remain important.

Finally, a well-managed DMO embraces and leverages external and internal audits to deliver accountability to its constituencies, especially the public. Disclosure of audit reports is an excellent tool to identify strengths and weaknesses and map out actions to correct weaknesses. Disclosure directly leads to efficiency and effectiveness improvements and makes sovereign borrowing cheaper and more sustainable.

References

- Aslan, Cigdem, Artan Ajazaj, and Shurufa Abdul Wahidh. 2018. Study on Public Debt Management Systems and Results of a Survey on Solutions Used by Debt Management Offices. Policy Research Working Paper 8544. Washington, DC: World Bank.
- Australian Office of Financial Management. 2016. Annual Report 2015-16. Canberra.
- Balibek, Emre, Ian Storkey, and Hakan Yavuz. 2021. Business Continuity Planning for Government Cash and Debt Management. Technical Notes and Manuals 2021/10. Washington, DC: International Monetary Fund (IMF).
- Business Continuity Institute. 2013. Good Practice Guidelines 2013 Global Edition Edited Highlights.
- Cavanagh, Joe, Suzanne Flynn, and Delphine Moretti. 2016. Implementing Accrual Accounting in the Public Sector. Technical Notes and Manuals 16/06. Washington, DC: IMF.
- Cebotari, Aliona. 2008. Contingent Liabilities: Issues and Practice. IMF Working Paper WP/08/245. Washington, DC: IMF.
- Currie, E. 2014. Transparency and Stakeholder Relationship Management in Public Debt Management. Presentation. Sovereign Debt Management Forum. World Bank.
- Controller and Auditor General. 2007. Effectiveness of the New Zealand Debt Management Office. Performance Audit Report. Wellington.
- Dener, Cem, Joanna Alexandra Watkins, and William Leslie Dorotinsky. 2011. Financial Management Information Systems: 25 Years of World Bank Experience on What Works and What Doesn't. Washington, DC: World Bank.
- Gebregziabher, Fiseha Haile and Albert Pijuan Sala. 2022. Mozambique's 'Hidden Debts': Turning a Crisis into an Opportunity for Reform. World Bank Blogs. April 19.
- Hashim, Ali. 2014. A Handbook on Financial Management Information System for Government: A Practitioners Guide for Setting Reform Priorities, Systems Design, and Implementation. The World Bank Africa Operations Services Series 100509. Washington, DC: World Bank.
- Institute of International Finance. 2019. Voluntary Principles for Debt Transparency. Washington, DC.
- Institute of International Finance. 2020. Principles for Stable Capital Flows and Fair Debt Restructuring. Washington, DC.
- International Monetary Fund. 2011. Public Sector Debt Statistics—Guide for Compilers and Users. Washington, DC.
- International Monetary Fund. 2013. External Debt Statistics: Guide for Compilers and Users. Washington, DC.
- International Monetary Fund. 2014. Government Finance Statistics Manual 2014. Washington, DC.
- International Monetary Fund. 2018. Fiscal Transparency Handbook. Washington, DC.
- International Monetary Fund and World Bank. 2014. Revised Public Debt Management Guidelines. Washington, DC.

- International Monetary Fund and World Bank. 2018. G-20 Note: Improving Public Debt Recording, Monitoring, and Reporting Capacity in Low and Lower Middle-Income and Countries: Proposed Reforms.
- International Accounting Standards Committee Foundation. 2000. IPSAS 5, Borrowing Costs.
- International Accounting Standards Committee Foundation. 2001. IPSAS 15, Financial Instruments: Disclosure and Presentation.
- International Accounting Standards Committee Foundation. 2002. IPSAS 19, Provisions, Contingent Liabilities and Contingent Assets.
- International Accounting Standards Committee Foundation. 2010. IPSAS 28, Financial Instruments: Presentation.
- International Accounting Standards Committee Foundation. 2010. IPSAS 30, Financial Instruments: Disclosures.
- International Accounting Standards Committee Foundation. 2018. IPSAS 41, Financial Instruments.
- Institute of International Finance. 2022. Best Practices for Investor Relations: 2022 Update.
- Irwin, Timothy C. 2012. Some Algebra of Fiscal Transparency: How Accounting Devices Work and How to Reveal Them. IMF Working Paper WP/12/228. Washington, DC: IMF.
- Magnusson, Tomas, Abha Prasad, and Ian Storkey. 2010. Guidance for Operational Risk Management in Government Debt Management. Washington, DC: World Bank.
- Organisation for Economic Co-operation and Development. 2013. Budgeting for Contingent Liabilities. Working Party of Senior Budget Officials. Discussion Paper. 34th Annual Meeting of OECD Senior Budget Officials. Paris. June 3-4.
- Organisation for Economic Co-operation and Development. No date. Measuring Government Debt: From D1 to D4.
- Proite, Andre. 2017. Debt Records and Operational Risk. Presentation. 11th UNCTAD Debt Management Conference. Geneva. Nov. 13-15.
- Proite, Andre. 2020. Recording, Monitoring and Reporting Public Debt. MTI Discussion Paper 18. Washington, DC: World Bank.
- Requin, Anthony. 2016. Webinar: Transparency and Communications. Webinar presentation. Agence France Trésor. June 28.
- Rivetti Diego. 2021. Debt Transparency in Developing Economies. Washington, DC: World Bank.
- Storkey, Ian. 2011. Operational Risk Management and Business Continuity Planning for Modern State Treasuries. Technical Notes and Manuals 11/05. Washington, DC: IMF.
- Tokaç, Hakan and Mike Williams. 2013. Government Debt Management and Operational Risk: A Risk Management Framework and its Application in Turkey. Sigma Papers 50. Paris: OECD Publishing.
- Ülgentürk, Lerzan. 2017. The Role of Public Debt Managers in Contingent Liability Management. Working Papers on Sovereign Borrowing and Public Debt Management 8. Paris: OECD.

United Nations Conference on Trade and Development. 2021. 40th Anniversary Briefing on the DMFAS Programme.

World Bank. 2021. Debt Management Performance Assessment Methodology: 2021 Edition. Washington, DC.

Chapter 10

Institutional Arrangements for Public Debt Management

Phillip Anderson

Abstract

Financing governments is a complex, technical process that spans widely—from designing a strategy that balances costs and risks, to executing transactions in markets, designing instruments to fit infrastructure investment, managing operational risk and ensuring legal compliance. The professionals charged with financing governments operate within institutions whose laws, rules, norms and cultures can make or break the final quality of public debt management. Which institutions are those? How are they designed? How do they coordinate with each other? What resources do they need? How are they held collectively accountable? How do they manage relationships with investors? And how can their quality be assessed? These are some of the questions that the chapter tackles.

10.1. Introduction

Previous chapters provide a detailed picture of what public debt management involves, from designing strategies that will shape the composition of debt in the medium term to sourcing financing and managing risk. Here, we review the institutional arrangements required to deliver public debt management to governments with a high degree of accountability.

The second section outlines the core governance and accountability arrangements. Debt management does not happen in isolation, and coordination with other policy and operational areas of government is addressed in section 3. We examine the internal setup of a debt management office (DMO) in section 4, including the required resources and management of operational risk. Section 5 focuses on how relationships with investors are managed. And lastly, section 6 introduces a tool that may be used to assess the quality of debt management institutions.

10.2. Governance

In the context of public debt management, “governance” can be described as how the government executes political power to finance its operations, as defined in the constitution and law. Governance is reflected in the legal framework, institutional responsibilities and accountability arrangements.

The governance framework is shaped by the nature of the task at hand, which can be defined as follows (IMF and World Bank 2014, 5):

Public debt management is the process of establishing and executing a strategy for managing the government’s debt in order to raise the required amount of funding at the lowest possible cost over the medium to long run, consistent with a prudent degree of risk. It should also meet any other public debt management goals the government may have set, such as developing and maintaining an efficient market for government securities.

The arrangements must ensure the government develops and adheres to a prudent debt management strategy. As executing the strategy requires undertaking sizable financial transactions, the public and other stakeholders need a high degree of assurance that operations are appropriately controlled and reported.

10.2.1. Institutional responsibilities and legal framework

While approaches vary across countries, depending on constitutional arrangements and public administration practices, international sound practices have common main elements. The responsibilities of the legislature (parliament, congress), the executive, and the DMO are set out below.¹²¹

¹²¹ “DMO” describes the area with functional responsibility for managing public debt. In practice, a DMO may be a department, directorate, division, sub-secretariat, agency, etc. In some countries, more than one entity may be involved.

The legislature's main role is to empower borrowing through laws and exercise oversight of the executive in its public debt management. At a minimum, legislation should clearly state the government's power to borrow, invest and enter into other financial obligations. Legislation should define what constitutes "public debt," the permitted instruments and the purposes of borrowing. Lastly, legislation should specify the roles of the various institutions and any powers to delegate functions.¹²²

Legislation may be used to strengthen transparency and accountability in the management of public debt by

1. including debt management objectives in law,
2. requiring the government to produce and publish a strategy,
3. requiring the government to report frequently on public debt and
4. specifying the consequences of noncompliance with the law.

While such clauses occur in legislation less frequently than those that are minimally required, as described above, the trend is for their inclusion.¹²³

A strong case can be made for including objectives in legislation. They provide a reference point for choices about borrowing, which may have significant repercussions for future tax and spending settings beyond the current government's term. Including objectives gives them prominence, avoids ad hoc and frequent changes, and provides a touchstone for holding the government accountable.¹²⁴

The main debt management objective can be summarized as "to ensure that the government's financing needs and its payment obligations are met at the lowest possible cost over the medium to long run, consistent with a prudent degree of risk" (IMF and World Bank 2014, 7). While the objectives developed by each country differ, they are typically variations on the theme.¹²⁵ The objectives may refer to developing the domestic debt market.

The responsibilities of the executive or the government of the day are to decide on the debt management strategy and oversee DMO operations. The strategy will be shaped by the circumstances at the time, such as

1. projected borrowing requirements,
2. assessment of vulnerability to volatility in exchange rates and interest rates and other fiscal risks and
3. other policy trade-offs, e.g., developing the domestic debt market.¹²⁶

The executive (ministers) preferably operates at the strategic level and is not

¹²² For a more detailed description of debt management legislation and country examples, see chapter 9 of this publication and Rivetti (2021).

¹²³ See Rivetti (2021), chapter 4. Two examples of full legislation are Sierra Leone and Macedonia.

¹²⁴ The arrangement is consistent with other legislation for macroeconomic policy, e.g., monetary policy objectives and fiscal targets.

¹²⁵ For country examples, see Wheeler (2004).

¹²⁶ See chapter 2 on how strategy is developed.

involved in the details of transactions. Doing so reduces the risk of politicizing tactical decisions and potential policy conflicts, such as attempting to influence domestic interest rates in the short term. In some cases, such involvement is unavoidable (e.g., some official borrowing) or is desirable (e.g., a particularly prominent transaction, such as a country's first international sovereign bond).

The DMO is the “engine room” of debt management: its responsibilities are to make recommendations on the strategy and implement it as decided by the executive. (Section 4 describes how the DMO is organized and performs its role.)

Debt management is easier if executed by one entity. The arrangement reduces coordination costs, provides efficiency gains and facilitates the development of institutional capability. Multiple entities usually mean multiple information technology (IT) systems, which hinder portfolio analysis and reporting on debt. A trend has been to consolidate debt management into a single DMO, although some countries have not yet taken this step. In such countries, the most common division of responsibility is by the type of borrowing, e.g., domestic securities issuance.

It is common to contract out aspects of debt management. For example, a central bank may run the mechanics of domestic debt auctions, as they have systems in place for their daily open market operations. State-owned enterprises often undertake infrastructure financing. In these cases, coordination is necessary, for example, to avoid clashes in the timing of borrowing in markets and to report public sector debt on a timely basis. Agency agreements between the DMO and central bank are sound practice.

Some countries use a board or advisory committee to assist senior management and ministers in overseeing the DMO because of its specialized nature. Comprising experts in economics and financial markets, such bodies can provide quality assurance about the DMO's performance, process integrity and operational risk management.¹²⁷

10.2.2. Location of the debt management office

The location of a DMO varies across countries, although in most, it resides within the finance ministry.¹²⁸ The other organizational form is an agency, the four main types of which are the following:

1. Outsourced to the central bank, e.g., Denmark, Iceland
2. Separate agency established through an executive decision, e.g., the United Kingdom (UK), Australia, France
3. Separate agency established under a statute, e.g., Ireland, Nigeria, Saudi Arabia
4. Entity established under general company law, 100% owned by government, e.g., Germany, Hungary

¹²⁷ For example, Ireland, Saudi Arabia and Sweden have boards of directors. New Zealand and the United States have advisory committees.

¹²⁸ The level in the finance ministry hierarchy varies: e.g., New Zealand (directorate), Indonesia (director general) and Brazil (under-secretariat).

Agencies generally have more operational independence, which is one of the reasons for establishing them. The arms-length nature of the arrangement emphasizes the separation of decisions on policy and strategy (by ministers) from the execution of transactions (by specialized professional staff). Agencies may provide more resource flexibility than a ministry, e.g., hiring specialized staff and installing required IT. Establishing an agency usually requires a formal accountability framework (such as a law, charter or agency agreement), which can result in stronger accountability than is the case for a DMO within a finance ministry.

A potential disadvantage of agencies is that their separation may hinder the policy and operational coordination outlined in section 3. Some authors point to agency risk, i.e., that the entity's behavior may not fully align with the interests of the principal (the finance minister).¹²⁹

In any event, a dichotomy between agencies and location in the finance ministry cannot fully explain differences in institutional arrangements (Anderson 2006). A deeper look into the setup is required: the degree of managerial authority over budgets and hiring practices varies; in some countries, the staff remain public servants; and various reporting and accountability mechanisms exist.

The diversity of institutional arrangements indicates the absence of a single “model.” Countries embarking on reform of their public debt management function need to develop an institutional form that best fits their system of government. It is worth noting that some countries that chose agency structures had a history of employing the arrangement (Anderson 2006). For example, the UK DMO is an “executive agency,” and executive agencies collectively employ about 75% of all civil servants in the UK; the Australian Office of Financial Management is a “prescribed entity,” of which more than 50 exist; and Sweden has a long history of delivering government services through agencies, of which the Swedish National Debt Office is just one.

10.2.3. Transparency and accountability

Given the size of public debt and the risk it poses to the budget and balance sheet in most countries, the public, investors and other stakeholders have a right to know how it is managed. Transparency is required at three levels. The first is disclosure of the legal and institutional framework, including clarity in the roles and responsibilities of the main entities involved in public debt management. The level extends to the objectives so that they are understood, and the authorities are seen to make a credible commitment to meet them.

The second level is transparency about the public debt management strategy and annual borrowing plans. The level assures that the government is working to meet the objective and that risk is managed appropriately. When the government discloses its intentions for the borrowing program, investors can plan their activities with greater certainty, lowering the government's financing cost (discussed further in section 5).

¹²⁹ See Currie et al. (2003) for more analysis of the issue.

One question for emerging-market and developing-country sovereigns concerns the appropriate degree of transparency. What are the reputational costs of failing to adhere to a strategy? The issue may be tackled by calibrating the level of detail the strategy contains: for example, by expressing it as a range of intended portfolio outcomes. Or the strategy could be explicit about the need for contingencies, which specified events could trigger. In some circumstances, it is appropriate not to disclose intentions, such as details about debt buybacks, as disclosure may push prices against the borrower.

The third level of transparency is making available comprehensive reporting on the management of public debt. The level includes debt composition, outcomes compared to the strategy, disclosure of contingent liabilities and borrowing operations. A full description of reporting and accounting is in chapter 8 and the need for more active communication with investors in section 5 of this chapter.

In addition to full transparency, accountability is bolstered by the DMO's internal audit and compliance functions (see section 4). External auditing is essential in assuring the legislature that debt reporting is accurate and that operational risk is effectively managed (see chapter 8 for details).

DMOs are held to account through an evaluation of their performance. Whether a DMO successfully implemented the strategy should be assessed. The quality of the process used to develop the strategy should be appraised, including the nature of the analytical tools applied, use of a peer review process and extent of consultation, e.g., with the central bank.

Leading DMOs develop accountability frameworks, such as the use of key performance indicators.¹³⁰ External tools, too, are available, such as the World Bank's Debt Management Performance Assessment methodology (see section 6).

10.2.4. Some history

While governments have borrowed for centuries, public debt management as a distinct policy and operational area emerged in smaller Organisation for Economic Co-operation and Development (OECD) countries in the 1980s. To a large extent, high levels of public debt, with a significant proportion denominated in foreign currencies, propelled development. The 1980s were a period of financial innovation, including the emergence of the swap market, which allowed governments to change the composition of their debt and take advantage of arbitrage opportunities.

At the time, governments had yet to set a specific objective or strategy for managing the composition of public debt and focused insufficiently on risk. Responsibilities for borrowing were usually spread across several operational areas and were often subsidiary to other functions, such as monetary policy. Officials had an inadequate understanding of markets, and operations could have been more professional. As a result, significant investment in institutions was required.

¹³⁰ For a good example, see the annual report of the UK DMO.

The emerging-market debt crises of the 1990s highlighted the need for more effective management of public debt because risky debt portfolios, with a major share of foreign-currency and/or short-tenor securities, exacerbated most of the events.¹³¹ In response, the Guidelines for Public Debt Management (IMF and World Bank (2014) were developed in 2001 and revised in 2014. Much of the thinking behind the topics in the Multilateral Cooperation Center for Development Finance's (MCDF) workshop series and in this chapter has been developed since then.

The development path of each country has been unique, but some trends have been discernable. Many developing countries initially relied largely on financing in foreign currencies from official sources, and a number still do, which shaped their institutional arrangements. As domestic funding sources and access to the international capital market become available, finance ministries must expand their capabilities. Commercial bank lending, a mainstay of sovereign financing for centuries, has been replaced almost entirely by securities markets, which changes the nature of legal risks (see chapter 9) and management of relationships with investors.

10.3. Policy and Operational Coordination

The emergence of public debt management as a distinct policy and operational area with its own objectives raised the issue of coordination with fiscal and monetary policies. At a more operational level, public debt management must coordinate with the annual budget process, cash management, monetary policy implementation, contingent liabilities management and borrowing of the broader public sector. Developing the domestic debt market is an endeavor that involves many entities across government and the private sector, and public debt managers play a significant role in the process. The section describes the nature of the DMO's relationships with each area.

10.3.1. Policy dependencies and conflicts

The objectives and policy tools (or instruments) for public debt management and fiscal and monetary policies are summarized in Table 10.1. While objectives and policy tools vary across countries, most observers would find them uncontroversial.

While life for policymakers would be fairly straightforward if they could implement their objectives independently, they cannot because of dependencies between each area. For example, fiscal policy decisions drive the level of public debt, influencing choices in debt composition. Fiscal policy impacts economic output, which needs to be factored into decisions on the stance of monetary policy. Decisions about the composition of domestic debt by debt managers and the level of short-term interest rates by the central bank jointly influence the shape of the yield curve, each institution's decision-making and so on.

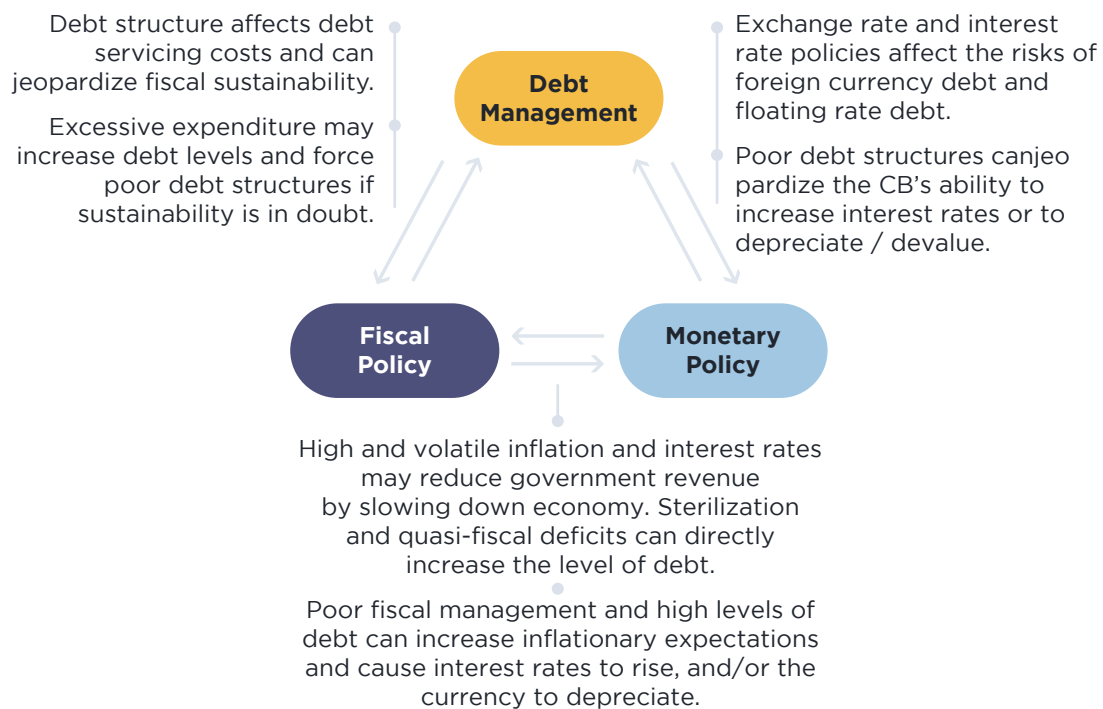
¹³¹ For example, see Eichengreen and Hausmann (1999), who used the term "original sin" to describe a situation where debt managers had to choose between borrowing in foreign currencies or the domestic currency at very short tenors.

Table 10.1. Policy Objectives and Tools

Policy Area	Objectives	Tools
Debt management	Minimize long-term debt servicing costs, subject to a prudent level of risk	Composition of the debt portfolio
Fiscal policy	Achieve the least distorting budgetary policy to improve resource allocation and achieve distributional objectives, subject to prudent debt levels	Level and composition of spending and taxation, determines debt level
Monetary policy	Achieve price stability	Interest rates, exchange rates or money aggregates
Financial regulation	To maintain public confidence in the efficient, fair and stable functioning of financial markets	Financial regulation and surveillance, guarantees and provision of liquidity
Infrastructure financing	Efficient financing of a nation's infrastructure requirements	Optimizing the mix of financing channels, vehicles and instruments

Source: Author.

The dependencies can become a source of policy conflict and force trade-offs, the nature of some of which is illustrated in Figure 10.1.

Figure 10.1. Policy Interdependencies and Tradeoffs

Source: Adapted from Togo (2007).

To enhance policy credibility and reduce the probability of suboptimal trade-offs, policymakers need to coordinate and work toward a sustainable policy mix. The mix could be described as objectives and trade-offs likely to result in economic conditions acceptable to governments and the public over time. What could the mix look like? An example would be the following:

- **Fiscal policy.** Target a prudent range for public debt to create a buffer in the case of shocks and allow automatic fiscal stabilizers to operate (e.g., do not increase expenditure when high growth increases revenue).
- **Debt management.** Accept higher debt servicing costs today to reduce risk in the future.
- **Monetary policy.** Maintain price stability even if output needs to be constrained in the short run.

10.3.2. Coordination with fiscal policy and cash management

An unexpected increase in funding needs arising from fiscal decisions places pressure on debt managers.¹³² Their ability to source funding over a short time horizon may be impaired by a lack of access to international markets and official financing sources or limited absorptive capacity of the domestic market.

To mitigate the risk, debt managers can diversify funding sources (including by developing the domestic market), reduce refinancing risk (e.g., by limiting the amount of debt maturing in a year) and maintain cash buffers, particularly if sizable volumes of debt are maturing in the near term.

Management of debt, however, is limited in what it can achieve. If fiscal policy is on an unsustainable track, fiscal adjustment is required. Debt management is not a solution to poor fiscal management. At an operational level, budget preparation and execution, developing borrowing strategies and plans, and cash management are closely linked (Figure 10.2).

Fiscal authorities provide the baseline projections and risk scenarios for macroeconomic variables used by debt managers to analyze debt strategies, which will be the same as those used to forecast budgets. Fiscal authorities provide debt sustainability analysis, which informs the medium-term fiscal framework.

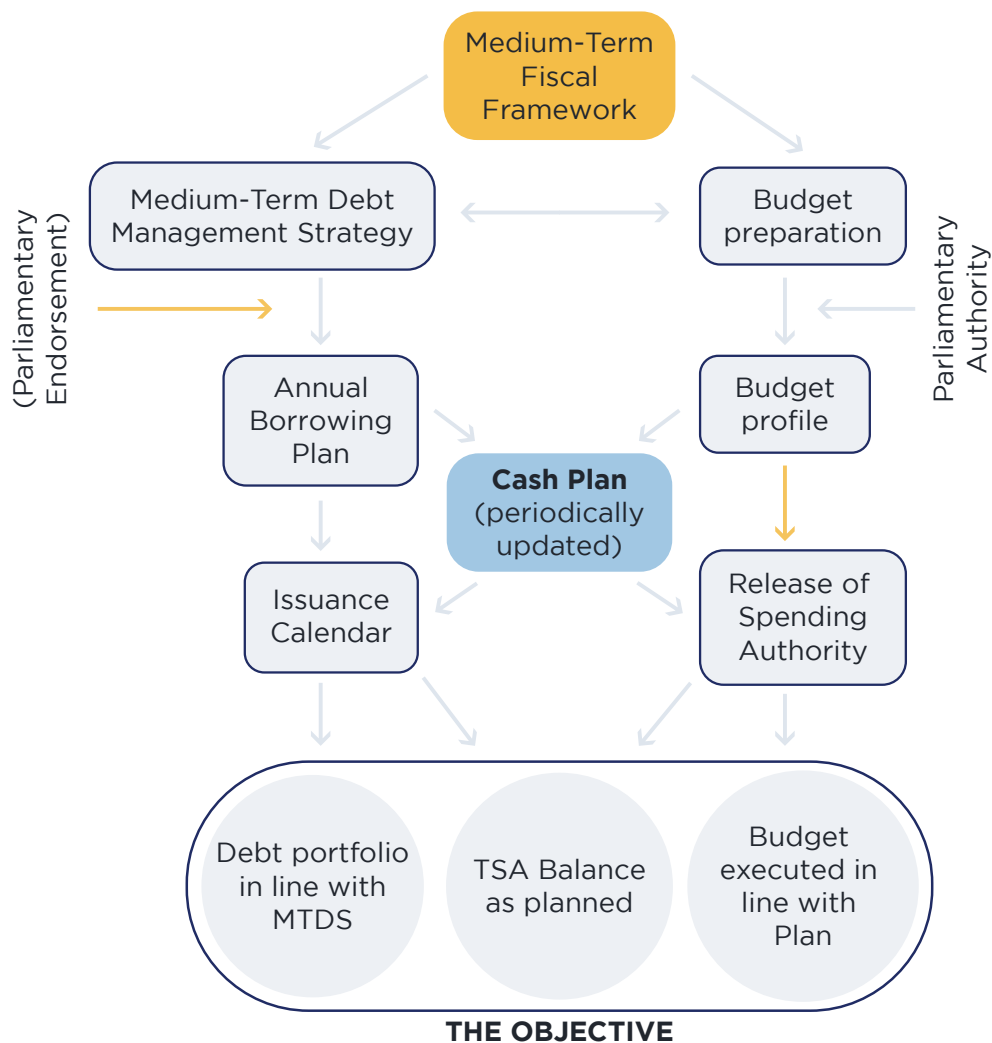
Debt managers forecast debt servicing costs for use in budget forecasts and analyze financial risk in the public debt portfolio, which may represent a significant fiscal risk. They also provide market feedback on demand for government securities and emerging concerns about sustainability.

In practice, the process may be iterative, as the preferred debt management strategy and feedback on market demand may change the budget forecast.

The debt manager requires timely and reasonably reliable cash flow and balance forecasts to plan borrowing activities. The consolidation of cash into a treasury single account facilitates the process.

Poor cash flow forecasting may cause abrupt changes to the borrowing calendar, resulting in insufficient time for the market to adapt, leading to poorer-quality auctions. The risk can be mitigated using cash management instruments, such as varying the volume of short-dated treasury bills rather than changing the calendar for bond issuance. Cash buffers play a role; as a rule of thumb, the poorer the quality of cash management, the larger the cash buffer needs to be.

¹³² The situation may occur frequently. See, for example, Panizza (2022).

Figure 10.2. Overview of Budget Execution and Financing

Source: World Bank (2021a).

Strong institutions are required to manage fiscal risks, which are covered in detail in chapter 5. The risks arise from many parts of government and require complex policy trade-offs. Accordingly, sound practice calls for centralizing authority to deploy explicit contingent liabilities as a policy tool (e.g., guarantees) and oversee and monitor all fiscal risks.¹³³ A government should have a clear risk management policy covering, for example, the circumstances when guarantees may be used, ceilings on volume that may be granted and incentives to reduce risk-taking.¹³⁴

¹³³ See IMF (2016) for a more detailed discussion.

¹³⁴ Two countries with effective institutional arrangements are New Zealand and South Africa (IMF 2016).

At a minimum, the fiscal authorities and debt management office should be aware of the government's contingent liabilities and consider them when developing medium-term fiscal and debt management strategies. Beyond that, practice varies across countries. A survey of OECD countries, plus Brazil and South Africa, found that in about two-thirds of the 33 respondents, the DMO played some role in assessing risk, monitoring and reporting on contingent liabilities (Ülgentürk 2017). The DMO was involved mainly in credit guarantees; in only a few countries was it involved in public-private partnership guarantees, insurance schemes and program loan guarantees (e.g., student loans).

10.3.3. Coordination with monetary policy

The cost of servicing public debt will be impacted by decisions on the stance of monetary policy. For example, unexpected increases in the inflation rate, the associated policy response and a depreciation of the local currency will increase interest costs. The risk of higher interest rates or local currency depreciation highlights the desirability of long-term, fixed-rate local-currency debt, although inflation-indexed debt has a role to play, given that tax revenues are largely real in nature.

A lack of monetary policy credibility should not influence the debt management strategy. Some may argue that if an inflation shock is expensive to the government, the government will increase its resolve to keep inflation in check. However, this line of thinking overlooks the fact that shocks may be outside the control of the government: for example, a global supply shock from commodity prices or supply chain disruptions. If a government does not value price stability in the policy mix, it is questionable that inflation-indexed debt would change its thinking.

Sound institutional arrangements call for debt management and monetary policy decisions to be clearly separated to ensure the credibility of both areas. For example, the efficacy of monetary policy settings may be doubtful if the public believes they are influenced by concerns over the cost of financing to the government. Similarly, if issuance decisions of debt managers are perceived to be influenced by inside information on monetary policy, their actions become a signal for monetary policy. They would also undermine the predictability of the supply of government securities, a cornerstone of an efficient primary market.

The risks of such misperceptions are more acute if the central bank acts as an agent for the DMO in issuing domestic securities. The risks may be mitigated using an agency agreement that sets out the roles of both institutions, which is released to the public.

Separation of monetary policy and debt management is more challenging when policy interest rates are at the zero lower bound. Given the perceived need to ease monetary conditions further, central banks aim to lower longer-dated interest rates by buying government securities financed by creating central bank money (quantitative easing). It can lead to a perception that the central bank is financing the government. In these circumstances, the separation of monetary policy and debt management is demonstrated by purchasing securities in the secondary market only. The separation must be reinforced by the independence and transparency of the central bank in its decision-making.

In a few countries, the same instrument is used to finance the government and implement monetary policy: for example, the issuance of treasury bills. In this situation, the authorities should clearly announce when they issue them and put in place separate accounting and reporting. Separation of debt management and monetary policy may be reinforced by issuing different tenors (e.g., one month for monetary policy, longer tenors for debt management).

The monetary authorities require a regular flow of high-quality information on forecast debt payments and government cash flows. The information is needed to implement operations that control the financial system's liquidity level, as government transactions greatly influence it. Transactions related to any foreign-currency debt may influence the level of foreign-currency reserves managed by the central bank and, ultimately, the market exchange rate.

10.3.4. Developing domestic debt markets

Developing domestic debt markets is complex and usually requires multiple, interdependent policy actions across six building blocks: the money market, the primary market, the secondary market, the investor base, the market infrastructure and the legal and regulatory framework (see IMF and World Bank [2021]). The process requires coordination among the debt manager, the central bank, financial regulators, financial market infrastructure providers, primary dealers, traders and investors.

The debt manager may have an influential role in the process, given its responsibility for all aspects of the primary market for government securities—usually the largest component of the debt market. The debt manager may lead the coordinated effort, given the direct interest of the government in an efficient market to cost-effectively meet its financing requirements. Decisions taken by the debt manager may also influence the functioning of the secondary and money markets and the nature of the investor base.

10.3.5. Coordination with infrastructure financing

In many instances, infrastructure expenditures are part of the government's annual budget and, therefore, will be covered by the annual borrowing plan (described in chapter 3). When infrastructure investment is undertaken by state-owned enterprises (SOEs) or other government entities, there will need to be coordination with the DMO. The degree of coordination with public debt managers will depend on how infrastructure financing costs will be funded, particularly whether a project will be self-funding (e.g., from user fees). If a project is expected to be funded from general taxation, then financing costs are effectively part of the government's debt interest costs. In this case, project financing should conform to the government's debt management strategy.

Public debt managers and project implementation units must closely coordinate on disbursements. This is the moment when debt is incurred, and information is needed to ensure that public debt records are accurate and up to date. Even if the debt is in the name of a separate public entity, such as a state-owned enterprise, the data are required for public sector debt records.

Lastly, debt managers have an interest in any government guarantees granted for infrastructure projects. Guarantees represent a contingent liability that could impact the level and composition of public debt in the future. In some settings, debt managers have a role in issuing guarantees, e.g., assessing credit risk and compliance with government policy and monitoring and reporting on them during their duration.

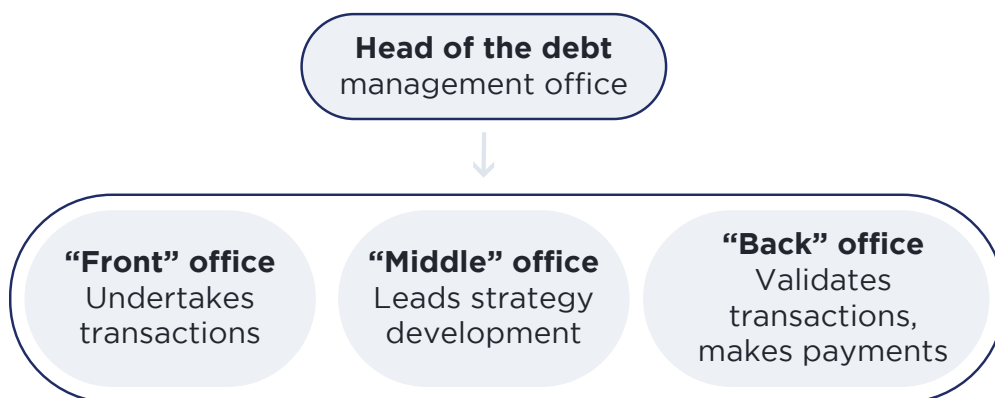
10.4. Internal Organization

The internal organization of a DMO is critical to effectively finance the government—whether for infrastructure or deficit financing—and to manage operational risk. This section describes the structure and main functions of a DMO and the human resources and IT required to deliver its services. Failure to manage operational risk can impose significant financial and reputational costs on government. The approach to managing operational risk is outlined here. In cases when SOEs or other government entities seek infrastructure financing from official sources or markets, the same principles and considerations apply.

10.4.1. Structure of a debt management office

The internal organization of a DMO reflects its role in undertaking high-value financial transactions. As is the case in the private sector, a structural separation must exist between individuals negotiating and agreeing on transactions (the “front” office) and those confirming the transactions and making payments (the “back” office) (Figure 10.3). This fundamental separation is designed to reduce the risk of errors and fraud.

Figure 10.3. Internal Structure of the Debt Management Office



Source: Author.

Separating those leading the design of the strategy (“middle” office) from the transaction execution team is highly desirable. Personnel executing transactions become close to the market and other counterparts; if those personnel are also

charged with designing the strategy, the risk is that they overemphasize market needs at the expense of the government's cost-risk preferences.

The terms “front” and “back” office are borrowed from the private sector. While some countries use them, many are given more functional descriptions. Some countries with large and complex debt portfolios have more than one front office, with one focusing on market borrowing, for example, and another on official and project financing.¹³⁵

While the three groups cover the main functions of a DMO, other functions are required to support the operation. The other functions and their possible organizational locations are summarized in Table 10.2.¹³⁶

Table 10.2. Additional Functions Required in a Debt Management Office and Their Locations

Area	Roles	Location
Risk monitoring and compliance	Monitoring compliance with the strategy, risk limits, operational risk policies and contractual and statutory obligations; internal audit	Often located in the middle office but could report separately to head of DMO; may report above head of DMO (aligns with financial sector practice); should not be in front or back office
Legal advice	Negotiation of loans, documentation and legal advice on new instruments, guarantees and on-lending, new laws	Sometimes within the DMO, or a service provided by the finance ministry (or elsewhere); specialized advice from outside counsel is usual
Financial and other reporting	Statutory and contractual reporting on DMO activities, public debt, contingent liabilities	Sometimes located in the middle or back offices; includes contributing to central government financial reporting
Stakeholder relations	Tailoring provision of information to all stakeholders (within government, the public, financial sector); helps coordinate relationships	Sometimes part of the front or middle office, may be a separate group (investor relations office); coordination required with other communication groups in government
Specialized information technology	A critical piece of infrastructure; provides formal record of public debt, increases efficiency, facilitates complex analysis	DMO usually will have a specialized information technology team (including within a ministry)
Organizational support	Human resources, information technology, resource management, general administration	Agencies usually need to provide the services in-house; within ministries, services are often shared
Policy advisory services	Providing capital markets and financial risk management advice to other government entities: state-owned enterprises, line ministries, regulators	Usually provided by staff in the front and middle offices; not undertaken by all debt offices

DMO = debt management office.

Source: Author.

¹³⁵ For example, Indonesia.

¹³⁶ Two examples of how these functions are arranged are Saudi Arabia and Greece.

10.4.2. Human resources

A DMO requires a set of skills that are often in demand by the private financial sector, including the following:

1. Understanding of macroeconomics, finance and public financial management.
2. Detailed and up-to-date knowledge of relevant financial markets, including market conventions, issuance techniques and institutions.
3. Skills in analysis, pricing and execution of financial transactions.
4. Financial modeling and risk management.
5. Skills in IT for financial instruments and transaction processing.

Too few staff, high turnover and the inability to recruit and retain qualified people are frequent problems of DMOs. The underlying causes are varied, but the inability to provide competitive remuneration is frequently an issue. The public sector, for example, might be unable to promote and increase remuneration as fast as the private sector as employees become more skilled.

Human resource management practices in the public sector can be a challenge. For example, a policy of rotating staff around departments in a ministry to develop skilled generalists can undermine efforts to build specialist skills in a DMO. Other obstacles include staff placement by centralized human resource departments, recruitment not based on skills and merit, inadequate training budgets and inflexible rules on staffing numbers.

In the face of these challenges, DMOs have found various solutions. Given the consequences of poor public debt management, some DMOs have successfully sought to relax human resource rules and regulations. Another measure is to supplement the DMO with temporary staff, such as resident advisors, external consultants and staff seconded from other organizations, such as the central bank. Capacity can be built through customized training; some examples include partnerships with local universities and short-term external assignments, e.g., with banks. International organizations also play a role and now offer training programs covering most DMO activities. The programs are provided free of charge (such as the MCDF's Workshop Series), as are resident advisors in some cases, such as those provided by the US Treasury Office of Technical Assistance.

In addition to tackling challenges by creating an agency, some countries have created "islands of excellence" or "enclaves," which sit alongside existing organizational structures. The entities can pay higher remuneration to attract the skills required for specialized functions in the public service.

10.4.3. Information technology systems

Effective and efficient IT systems are essential for DMO operations. The systems facilitate transparency, reduce operational risk, support decision-making and increase efficiency and productivity.

While the functionality of IT systems varies among DMOs, three core areas are essential.¹³⁷ First, an IT system must provide a highly secure, accurate record of the full terms of all debt-related transactions. The data in the IT system are the official record of the country's public debt, and their veracity and security need to be guaranteed. Second, an IT system must be able to generate projected cash flows through to the maturity of the last instrument. The projection is required to produce schedules of debt service payments so that the government can honor its commitments and be an input for many types of analysis. Third, the IT system must be able to turn out reports on public debt required for the government's financial statements and other reporting obligations and to support decision-making.

Beyond these core requirements, other IT functionalities are useful or desirable:

- **Undertake portfolio and risk analyses.** Based on scenario analysis or simulations.
- **Planning of future borrowings.** The ability to test potential alternative plans.
- **Interface and/or integrate with other systems.** E.g., public financial management systems, third-party market data providers, auction system providers.
- **Straight-through processing.** Transactions are entered once and moved electronically through each process, including to external payment and settlement systems.
- **Performance measurement systems.** Track performance against benchmarks.

The system architecture used by DMOs falls into four types:

- **In-house systems.** Can be tailored to specific needs and are fully under the control of the DMO but prone to key-person risk.
- **Off-the-shelf provided by official organizations.** Designed for sovereign debt in developing countries but can be more difficult to adapt to changing needs.
- **Commercial off-the-shelf systems.** Reliable, adhere to industry standards, have scale and lower IT risk, but usually require significant customization and are expensive.
- **Hybrid approaches.** Combine the above elements, e.g., integrate task-specific commercial software with a core data system.

A World Bank survey of 31 countries across the income spectrum (Aslan et al. 2018) found that about half the countries, including most lower-income countries, had systems provided by official organizations. Middle-income countries were evenly split between official and in-house systems, with in-house systems installed in just over a quarter of the 31 countries. High-income countries tilted toward commercial systems (about 20% of all countries).

10.4.4. Operational risk

The business of a DMO has similarities to corporate and bank treasuries in that both execute high-value transactions, implying a similar approach to managing operational risk. As a result, operational risk frameworks implemented by DMOs are based on principles developed for the financial sector, e.g., the Bank for International

¹³⁷ For a detailed discussion, see Aslan et al. (2018).

Settlements (BIS) and the Committee of Sponsoring Organizations (COSO).¹³⁸ The BIS (2021, 2) defines operational risk as “the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events.”

Operational risk can be categorized in a range of ways, but the following types are appropriate for most DMOs:¹³⁹

1. **Technology and infrastructure failure.** Failure of IT, electricity and telecommunications; cyber security issues; and loss of data and physical records.
2. **Inability to access premises.** E.g., damage to buildings, security concerns, pandemic restrictions.
3. **Failure of key service and outsource providers.** E.g., data providers, fiscal agents.
4. **Human errors and failures.** E.g., errors, fraud, failure to follow processes.
5. **Failure to meet legal and other obligations.** E.g., regulations, reporting requirements.
6. **Natural disasters and civil disturbance.**

Managing operation risk is a dynamic process involving all areas of the organization and occupies considerable management time. The first step is to set objectives, define roles and then survey all business processes to identify risks. The risks can then be analyzed, measured and ranked based on the likelihood of occurrence and impact level if they occur (Figure 10.4).

Figure 10.4. Risk Exposure Matrix

		Impact level of risk				
		Insignificant	Minor	Moderate	Major	Catastrophic
Likelihood level	Very Low	1	1	2	2	3
	Low	1	2	2	3	4
	Medium	2	2	3	4	4
	High	2	3	4	4	5
	Very High	2	4	4	5	5

Source: Tokaç and Williams (2013).

Risk classification in an exposure matrix is a helpful tool to guide mitigation measures. For example, in Figure 10.4, mitigating the risks in the cells labeled “5” would be a high priority to make them less likely to occur and/or have a lower impact if they do. With mitigation measures, risks would then be allocated to a cell with a lower number.¹⁴⁰

¹³⁸ COSO is a joint initiative of five private sector associations of financial and accounting professionals in the US.

¹³⁹ Adapted from Storkey (2011).

¹⁴⁰ For an example of the approach to managing some sample risks, see that of Türkiye in Tokaç and Williams (2013).

Many facets of internal organization help reduce operational risk. The framework for managing people is critical, including position descriptions, performance agreements, individual training plans, succession planning and codes of conduct and ethics. Other important measures include the following:

1. Full documentation of all policies and procedure manuals.
2. Business continuity planning.
3. Operational audits.
4. Adequate governance and oversight.
5. Organizational design, reporting lines.

Active management is required to sustain operational risk at a satisfactory level. Managers need to foster a culture of risk awareness and reinforce knowledge of it with a cycle of training. Monitoring and incident reporting provides the opportunity to learn from mistakes and contribute to continuous improvement.

10.5. Managing Relationships with Investors

Effective two-way dialogue with investors improves outcomes for government in its financing activities, and many emerging-market DMOs have established formal investor relations programs. In this section, we review the requirements of investors and outline the documents, tools and activities that governments use to manage relationships with investors.

10.5.1. Definition and benefits to governments

The DMO must be transparent about its operations as part of its accountability to the executive, the legislature and the public. While the core data and information provided to investors are much the same, they are tailored to meet their specific needs.¹⁴¹

Knight and Northfield (2020, page 6) define investor relations as follows:

A strategic management responsibility that integrates finance, communication, marketing and securities law compliance to enable the most effective two-way communication between a sovereign, the financial community, and other constituencies, which ultimately contributes to a country's debt securities achieving fair valuation.

The definition was adapted from the US-based National Investor Relations Institute's definition, expressed in terms of companies.

¹⁴¹ "Investors" include banks, intermediaries, credit rating agencies and the media.

Transparency and investor relations reduce uncertainty risk to investors and can lower the government's borrowing costs. Studies have found that investors prefer more transparent markets (Gelos and Wei 2005), that improved fiscal transparency lowers borrowing costs (Kemoe and Zhan 2018) and that the adoption of International Monetary Fund (IMF) data standards reduces spreads of emerging-market sovereign bonds (Choi and Hashimoto 2017).

Effective communication channels are beneficial to sovereigns in challenging times. Reviewing lessons learned from the 2008-2009 global financial crisis, a group of debt managers from 33 countries highlighted the role of transparency; half of the 10 guiding principles the group developed featured it (IMF 2010).

Effective two-way communication between a DMO and investors helps plan borrowing, providing DMOs with a deeper understanding of investor preferences through time.

10.5.2. Investors' requirements

The Institute of International Finance (IIF) has developed a tool to assess countries' investor relations and data transparency practices (IIF 2020). The weightings assigned to each of the six areas measured by the tool provide insights into what is important to investors. Just over a third of the maximum possible score is contributed by "dissemination of macro data and policy information." It includes criteria such as a subscription to the IMF's Special Data Dissemination Standard, access to data (including historical) in downloadable formats and the provision of forward-looking and regulatory information.

"Feedback and communication channels" contribute another third of the maximum possible score and include meetings and roadshows, access to archives of presentations, access to senior officials and reflection of investor feedback in policy decisions. The remaining third of the score consists of "investor relations office," "website," "investor relations contact list" and "regular self-assessment."

Core principles for investor relations can be drawn from an understanding of investors' requirements:¹⁴²

1. **Transparency.** Publish all information, data and decisions relevant to price formation.
2. **Accessibility.** Officials can explain information and policy decisions (but not provide inside information to individual investors).
3. **Predictability.** Disseminate information on a timely basis and engage in a consistent pattern of behavior.
4. **Accuracy.** Produce data and information that are accurate and comprehensive and have procedures and processes to ensure quality.

¹⁴² Adapted from Knight and Northfield (2020).

10.5.3. Documents on public debt

DMOs produce documents to inform investors and the public on strategy, plans, the state of the debt portfolio and debt-related activity. As a rule of thumb, the documents should be easy to find, understand and use.

Some of the main documents are forward-looking: the debt management strategy (updated annually), the annual borrowing plan and issuance calendars (monthly or quarterly). They are described in detail in earlier chapters.

An annual report on debt management is invaluable for accountability. The report explains how borrowing plans were realized under the government's debt management strategy. The report also summarizes market conditions and initiatives taken to improve public debt management.

Investors, however, require more frequent information on debt developments, and the need is filled by the monthly or quarterly provision of debt statistics or a debt bulletin (or report). Debt statistics include data on debt stocks, broken down by creditor, residency classification, instrument, currency, interest rate basis and original and residual maturity. The publication typically covers debt flows (new borrowing, principal and interest payments) and loan guarantees.

A quarterly debt bulletin or report includes debt statistics. It contains context and commentary, such as market developments and yield curve changes, secondary market activity, summaries of auction results, discussion of international bond issuance, liability management operations and risk indicators. In practice, debt bulletins vary considerably across countries: good-quality bulletins can range from three to 50 pages.¹⁴³ Extensive use of figures and graphs allows faster interpretation in less space, and some countries refer to data published separately on the website.

Countries with leading investor relations practices publish a presentation to tell a story about the country and provide investors with key information in a highly engaging format. The presentation is usually oriented to the needs of nonresidents, who know less about the country and may invest in many others. A standardized presentation eases the delivery of consistent messages. Anticipating investors' questions and concerns is important; vulnerabilities or issues, for example, should be addressed. Some typical headings in an investor relations presentation are the following:¹⁴⁴

1. Country and/or issuer background.
2. Environmental, social and governance (ESG) initiatives.
3. The macroeconomy and market environment.
4. Public finances.
5. Structural reforms.
6. Public debt data and management, market access, taxation and regulation.
7. Plans.

¹⁴³ The Dominican Republic's quarterly debt report is a good example of a comprehensive one.

¹⁴⁴ See Brazil's investor relations presentation for a good example.

10.5.4. Investor relations tool and activities

An effective website is the cornerstone of a DMO's communication and investor relations strategy. A website provides data and information to stakeholders in a user-friendly format and serves as a "one-stop shop" for investors' needs. The main considerations when designing and managing a website are as follows:¹⁴⁵

- 1. Functionality.** Well-organized layout and a clear presentational style. English-language option.
- 2. Navigation.** Intuitive to use, easy to find required information.
- 3. Comprehensiveness.** Includes the full range of data and information. Key data can be downloaded.
- 4. Timeliness.** Keeps up to date and posts data when they are released. Regular reports should appear on specific dates (e.g., uses a calendar).
- 5. Ability to establish contact.** Provides details of named individuals for questions and comments. Provides an option to register for notifications.
- 6. Links to relevant government entities.** For example, the central bank or statistics agency.
- 7. Access to third-party opinions and analysis.** For example, credit rating agencies and reports from international financial institutions.

Other main investor relations tools and activities are roadshows, investor meetings, conference calls, media releases and an investor database (Table 10.3).

Table 10.3. Investor Relations Tools and Activities (except websites)

Investor Relations Tool or Activity	Description and Requirements
Roadshows	May be deal-related, non-deal, reverse (initiated by investors); usually arranged by underwriters; held at least annually
Investor meetings	Ad hoc, usually one on one, e.g., at the margin of industry events
Conference calls	Useful for short-notice interaction or after major news, e.g., budget. Cost-effective Should be recorded for replay; all information should be published on the website before the call
Media releases	Communicate key information outside cycle of meetings and calls, e.g., issuance calendar, data releases Keep them concise and clear and use all appropriate channels
Investor database	Monitor and log all investor contact, e.g., meeting minutes and communication preferences Using a spreadsheet is a good start; customer relationship software is more effective

Source: *Author*.

¹⁴⁵ A good example is the website of the Public Debt Administration of Serbia.

10.5.5. Investor relations strategy and program

An investor relations strategy must provide order and structure for managing relationships with investors and other key stakeholders. The strategy helps ensure that documents, tools and activities are best tailored to the needs of investors while making the most effective use of the DMO's resources. The strategy should include a detailed analysis of the investor base, updated at least annually and engagement plans for each type of investor. The plans should include the frequency and structure of contact and the types of activities and be tracked for progress during the year.

Managing investor relations is a distinct function in a DMO, and countries with sufficiently large debt and a well-staffed DMO set up an investor relations office. Otherwise, the function could comprise dedicated front or middle office staff. The investor relations function is required to *coordinate* across the DMO and other government areas to compile content, as well as with other communication groups in government, to ensure consistency of messaging. The investor relations function leads the *production* of all published documents and website content. Lastly, the investor relations function is responsible for *disseminating* media releases, notifications and material to mailing lists.

10.5.6. Recent trends

The IIF's (2020) latest assessment report on investor relations points to several trends. The first is a call from investors for more information on ESG factors, such as targets and commitments to the United Nations Sustainability Development Goals, carbon and greenhouse gas emissions trends and transparency in using funds from green and other ESG bonds.¹⁴⁶

The IIF survey shows continuous progress in the quality of investor relations in the 38 emerging-market countries surveyed: just over half had scores in the upper quartile of the scale in 2020. Since the first assessment in 2005, the number of countries with formal investor relations programs has increased from five to 16.

Few high-income countries' DMOs have formal investor relations programs. The DMOs usually operate in an environment of open and transparent data and policy information, where authorities already engage in dialogue with investors and the media.

10.6. Assessing the Quality of Debt Management Institutions and Processes

To improve the quality of institutional arrangements for managing public debt, it is necessary to understand how a country performs against international benchmarks. The Debt Management Performance Assessment (DeMPA) methodology, developed by the World Bank (2021a), provides a tool to perform the task.¹⁴⁷

A DeMPA report provides a government with a detailed picture of the strengths and weaknesses of institutions and processes, which can be used as input to a capacity-building program. Collectively, DeMPA reports provide the global community with

¹⁴⁶ An account of the sovereign ESG bond market in Hussain (2022) outlines the growth of investor interest in the product.

¹⁴⁷ The section draws from the latest version of the tool.

information on the pattern of challenges across countries to target support.

The DeMPA was first launched in 2007 and revised in 2015 and 2021 based on the extensive experience of its application. The DeMPA has been used by more than 150 national and subnational governments.

The section provides an overview of the methodology, performance indicators and a sample of results from the DeMPA's application.

10.6.1. Methodology and indicators

The DeMPA methodology is modeled on the Public Expenditure and Financial Accountability (PEFA) methodology, which covers a broad range of public finance activities. While PEFA touches on debt management, it does so at a high level, while the DeMPA provides a more detailed treatment of the function. The DeMPA covers central government debt management and related activities, such as loan guarantees and on-lending.

The methodology comprises 15 indicators, arranged in five areas, which span all aspects required for a sound institution, from the legal framework to IT systems (Table 10.4). The methodology assesses policy quality and operational coordination with fiscal and monetary policies and cash management.

A DeMPA report does not recommend reforms or institution building but specifies minimum standards that must be met. A report provides a picture of *what* the situation is; it is not focused on *why* this is the case.

Table 10.4. Debt Management Performance Assessment Indicators

Number	Title
Governance and strategy development	
1	Legal framework
2	Managerial structure
3	Debt management strategy
4	Debt reporting and evaluation
5	Audit
Coordination with macroeconomic policies	
6	Coordination with fiscal policy
7	Coordination with monetary policy
Borrowing and related financing transactions	
8	Domestic borrowing
9	External borrowing
10	Loan guarantees, on-lending and derivatives
Cash flow forecasting and cash balance management	
11	Cash flow forecasting and cash balance management
Debt recording and operational risk management	
12	Debt recording and payments
13	Data access, backups and information technology infrastructure
14	Debt-related records
15	Use of debt management information systems

Source: World Bank (2021a).

Each of the 15 indicators has subcomponents or debt performance indicators (DPIs); there are 35 DPIs in the DeMPA methodology. For example, indicator 2, “managerial structure,” has three DPIs:

1. DPI 2.1. The managerial structure for central government borrowing and debt transactions.
2. DPI 2.2. The managerial structure for issuance of central government guarantees and on-lending operations.
3. DPI 2.3. Staff and human resources.

Each DPI is assigned a score of A, B, C or D, where C indicates that the minimum requirements have been met. D is allocated if the minimum requirements have not been met or information is insufficient to make an assessment. An A is awarded if performance is consistent with international sound practice. Lastly, a B reflects performance between minimum requirements and sound practice.

Some DPIs have multiple requirements that must be satisfied to attain a particular score. For example, DPI 5.1, “Frequency and comprehensiveness of external audits,” has three requirements to score a C:

1. An external financial audit of debt management transactions is undertaken annually.
2. An external compliance audit of debt management transactions has been undertaken within the past two years.
3. Audit reports are publicly available within six months of completion.

If one requirement is not satisfied, the score would be D and the DeMPA report would identify the requirement so that the authorities know what needs to be improved.

The scoring system is cumulative. To score a B, the minimum requirements for C and additional requirements at the B level must be met. The same logic applies to scoring an A.

In some situations, a dimension cannot be assessed because it is not applicable, e.g., if derivative transactions (DPI 10.3) are not used, then N/A (not applicable) is assigned.

The scoring of each DPI must be consistent across countries when the tool is used by different teams or a country’s authorities. To reduce the risk of inconsistent results, the methodology includes several elements. The first is the context and rationale for each indicator so that the requirements have a frame of reference. Second, the requirements for each DPI are precisely described in a scoring table. The use of words such as “sufficient,” “reasonable” and “adequate” are avoided to reduce the scope for subjective interpretation. The revisions to the tool in 2015 and 2021 included sharpening the language.

The third element is the provision of guidance notes, as required, to help determine compliance with the requirements in situations where many interpretations are possible. Lastly, to assist in gathering information, the methodology provides lists

of supporting documentation to be requested and indicative questions to be asked. As a result, the methodology runs to almost 140 pages.

Many DPIs require laws, regulations, strategies, plans or procedures to be in place. When scoring a requirement, the assessor needs to determine if it is being followed in practice, i.e., that the institution fully complies with laws and regulations, or that strategies and plans have been implemented (or, if not, amended by the original authority). Otherwise, the requirement for the score has not been met.

The presentation accompanying the chapter provides a one-slide summary for each DPI, but the slides are not reproduced here. The summaries focus on the rationale, context and minimum requirements (a C score), with a brief reference to criteria for higher scores. For full details of the methodology and DPIs, see World Bank (2021a).

10.6.2. Debt Management Performance Assessment results

A country benefits from publishing a DeMPA report even though it might reveal institutional weaknesses. By being transparent, the authorities are signaling a commitment to reform, which may help mobilize resources and maintain the momentum to achieve results.¹⁴⁸ Nevertheless, most governments choose not to publish DeMPA reports, and only a few data are available. The World Bank's Debt Management Monitor aggregates data on DeMPA scores for individual countries (World Bank 2021b).

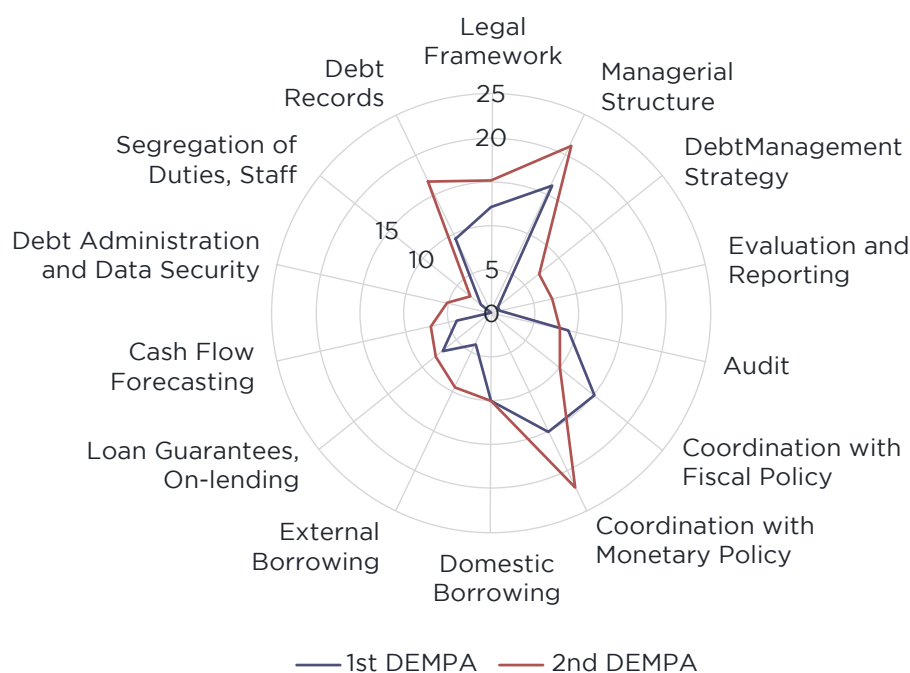
Some countries have undertaken more than one DeMPA, which provides a basis for tracking progress in debt management performance. The World Bank and IMF (2018) summarize changes in DeMPA scores for 37 low-income and lower-middle-income countries in 2008-2015. The results highlight many challenges. Figure 10.5 shows the number of countries that met the minimum requirements (a score of C or better) for each of the (then) 14 indicators. On average, countries met the minimum requirements for less than a third of indicators in the second DeMPA.

Problem areas are “debt administration and data security” and “segregation of duties and staff capacity,” where five or fewer countries met the requirements in the first and second DeMPAs. On the positive side, for “managerial structure,” “coordination with monetary policy” and “debt records,” about half or more countries met the requirements in their second DeMPAs.

The data show that while most areas showed improvement between the first and second DeMPAs, it has been uneven. In two areas, “audit” and “coordination with fiscal policy,” the number of countries meeting requirements fell. The overall result shows that much work still needs to be done to bring performance up to a satisfactory level across the board.

148 A collection of published reports may be accessed here.

Figure 10.5. Changes in Debt Management Performance Assessment Scores for 37 Low-Income and Lower-Middle-Income Countries



DeMPA = Debt Management Performance Assessment.

Source: World Bank, in World Bank and IMF (2018).

10.7. Conclusion

While central to public debt management, a DMO can perform effectively only if other institutions play their part. The legislature and executive have critical roles in setting the institutional and strategic framework, as well as in oversight and accountability (together with external auditors). Coordination with the fiscal and monetary authorities, government entities responsible for infrastructure financing, regulators and financial market participants is needed to ensure policy consistency and efficient implementation by all players.

Transparency in strategies, plans and operations is a central element of sound institutional arrangements. It ensures that the public, which ultimately services the debt, has full knowledge of its management. And transparency benefits the government by giving investors assurance and time to plan for public borrowing operations.

Over the last 20 years, countries across the income spectrum have come a long way in building the capacity of their debt institutions. But the world does not stand still. Countries must expand their capability to take advantage of new opportunities, such as developing their domestic debt markets, accessing ESG finance and better managing contingent liabilities or asset-liability management. The findings of DeMPA reports point to gaps in performance that need to be remedied. Fortunately, the global community recognizes that weaknesses in public debt management can threaten the overall development agenda, and support is available from many sources.

References

- Anderson, Phillip. 2006. Should Public Debt be Managed by a Separate Agency? In *Government Debt: New Trends and Challenges*, edited by Mike Williams. London: Central Banking Publications.
- Aslan, Cigdem, Artan Ajazaj Shurufa, and Abdul Wahidh. 2018. Study on Public Debt Management Systems and Results of a Survey on Solutions Used by Debt Management Offices. World Bank Policy Research Working Paper 8544. World Bank, Washington, DC.
- Basel Committee on Banking Supervision. 2021. Revisions to the Principles for the Sound Management of Operational Risk. Basel: Bank for International Settlements.
- Choi, S. and Y. Hashimoto. 2017. The Effects of Data Transparency Policy Reforms on Emerging Market Sovereign Bond Spreads. IMF Working Paper 17/74. International Monetary Fund, Washington, DC.
- Currie, Elizabeth, Jean-Jacques Dethier, and Eriko Togo. 2003. Institutional Arrangements for Public Debt Management. World Bank Policy Research Working Paper 3021. World Bank, Washington, DC.
- Eichengreen, B. and R. Hausmann. 1999. Exchange Rates and Financial Fragility. NBER Working Paper 7418. National Bureau of Economic Research, Cambridge, MA.
- Gelos, G. and S.J. Wei. 2005. Transparency and International Portfolio Holdings. *Journal of Finance* 60 (6): 2987-3020.
- Hussain, Farah Imrana. 2022. Thematic Bonds to Diversify Fiscal Sources. In *The Sustainability of Asia's Debt*, edited by Benno Ferrarini, Marcelo M. Giugale, and Juan J. Pradelli. Asian Development Bank and Edward Elgar Publishing Limited.
- Institute of International Finance (IIF). 2020. Principles for Stable Capital Flows and Fair Debt Restructuring: Report on Implementation by the Principles Consultative Group. Washington, DC.
- International Monetary Fund. 2010. Stockholm Principles: Guiding Principles for Managing Sovereign Risk and High Levels of Public Debt. Accessed April 6, 2022.
- International Monetary Fund. 2016. Analyzing and Managing Fiscal Risks—Best Practices. Washington, DC.
- International Monetary Fund and World Bank. 2014. Revised Guidelines for Public Debt Management. Washington, DC.
- International Monetary Fund and World Bank. 2021. Guidance Note for Developing Government Local Currency Bond Markets. Washington, DC.
- Kemoe, L. and Z. Zhan. 2018. Fiscal Transparency, Borrowing Costs, and Foreign Holdings of Sovereign Debt. IMF Working Paper 18 (189). International Monetary Fund, Washington, DC.
- Knight, James and Bill Northfield. 2020. Sovereign Investor Relations: From Principles to Practice. IMF Working Paper 20 (204). International Monetary Fund, Washington, DC.
- Panizza, Ugo. 2022. Fiscal Uncertainty: The Thankless Task of Forecasting Asia's Fiscal Accounts. In *The Sustainability of Asia's Debt*, edited by Benno Ferrarini, Marcelo M. Giugale, and Juan J. Pradelli. Asian Development Bank and Edward Elgar Publishing.

- Storkey, Ian. 2011. Operational Risk Management and Business Continuity Planning for Modern State Treasuries. Technical Notes and Manuals. Fiscal Affairs Department, International Monetary Fund, Washington, DC.
- Rivetti, D. 2021. Debt Transparency in Developing Economies. Washington, DC: World Bank.
- Togo, Eriko. 2007. Coordinating Public Debt Management with Fiscal and Monetary Policies: An Analytical Framework. Working Paper WPS4369. World Bank, Washington, DC.
- Tokaç, H. and M. Williams. 2013. Government Debt Management and Operational Risk: A Risk Management Framework and its Application in Turkey. Sigma Papers 50. OECD Publishing, Paris.
- Ülgentürk, Lerzan. 2017. The Role of Public Debt Managers in Contingent Liability Management. OECD Working Papers on Sovereign Borrowing and Public Debt Management 8. OECD Publishing, Paris.
- Wheeler, G. 2004. Sound Practices in Government Debt Management. World Bank. Washington, DC.
- World Bank. 2021a. Debt Management Performance Assessment Methodology: 2021 Edition. Washington, DC: World Bank.
- World Bank. 2021b. Debt Management Monitor: Debt Management Technical Assistance for DMF Eligible Countries, 2012-2020. Washington, DC: Debt Management Facility and World Bank.

About the Authors

Phillip Anderson

Anderson is a recognized global expert on public debt management, with over 30 years of experience in the field, both as a practitioner and an advisor. He has extensive experience managing highly skilled teams and authored publications and papers in the field. He is a member of the Board, National Debt Management Centre of the Kingdom of Saudi Arabia, a member of the New Zealand Treasury Capital Markets Advisory Committee, and a member of the Panel of Experts for the Debt Management Facility, a multi-donor trust fund managed by the World Bank. Anderson is an independent consultant, providing consulting services to the IMF (Eastern Caribbean Currency Union, Uruguay, Singapore Regional Training Institute, Sri Lanka, Jamaica, Malawi, Palestine, Solomon Islands and UAE), World Bank (Azerbaijan, Indonesia, Sri Lanka, Saudi Arabia, Vietnam, Zimbabwe, and training on balance sheet risk management and other topics), Asian Development Bank (Myanmar), Swiss Re and the Milken Institute.

M. Coşkun Cangöz

Public financial management expert specializing in debt and cash management with almost 30 years of experience as a practitioner and consultant. He worked at the World Bank Treasury managing debt management advisory services in more than 30 countries, leading the design and delivery of training programs, including Sovereign Asset and Liability Management, Cash Management, Contingent Liabilities, and developing advisory services to support countries in establishing of the SALM framework. He previously worked at the Turkish Treasury for two decades, seven years as the Director General for Public Finance, where he managed USD140 billion in annual cash flow and USD250 billion of government debt. He has coordinated debt management reform, established risk management, led the development of the government bond market and modernized cash management. M. Coşkun Cangöz currently provides consultancy to the IMF, the World Bank, Asian Development Bank, European Commission and other institutions. He is an adjunct lecturer on public economics at TOBB University of Economics and Technology and the Director of the Center for Fiscal and Monetary Studies at the Economic Policy Research Foundation of Turkey (TEPAV). He is the author of books and many articles on public finance.

Antonio Davila

Davila is a global finance expert with 20 years in banking, capital markets, public finance, and risk management. He worked in the Treasury of the World Bank for 15 years, providing advisory services and financial solutions for public and private sector clients in 20+ countries, partnering with commercial, investment and development banks. He led the origination, structuring and execution of about USD20 billion in capital markets transactions to manage interest, currency, liquidity, oil prices and disaster risks, and advised on a USD70 billion project portfolio in the infrastructure, macro-fiscal and banking sectors.

Marcelo M. Giugale

Currently an Independent Consultant to governments and international institutions, Marcelo M. Giugale is the former Director of the World Bank's Department of Financial Advisory and Banking Services—the team of professionals who help governments in emerging and developing countries manage their assets, their debts and their risks. A former Director of country, sector and practice departments, and an international development leader, his more than thirty years of experience span the Middle East, Eastern Europe, Central Asia, Latin America and Africa, where he led senior-level policy dialogue and over thirty billion dollars in lending and insurance operations across the development spectrum. An Adjunct Professor at Georgetown University and a Fellow of the US National Academy of Public Administration, he has published on macroeconomic policy, finance, subnational fiscal rules, development economics, business, agriculture and applied econometrics.

Ede Ijjasz

Ede Ijjasz is the CEO and Founder of Eigen Impact Consulting, a boutique consulting firm providing strategic services on sustainability, climate change, infrastructure, finance and ESG. Mr. Ijjasz has over 30 years of senior technical and management experience at the World Bank, academia and consulting. He is a Senior Advisor to the CEO of the MCDF, Senior Non-resident Fellow at the Brookings Institution, and Senior Advisor to the CEO of the Global Center for Adaptation. During his World Bank career of more than twenty years, he was responsible for USD80 billion of investments and close to 800 policy reports on infrastructure and sustainable development in all developing regions of the world. He has been featured in several global media outlets such as CNN, Wall St. Journal, Time, The Economist, LA Times and CNBC. Mr. Ijjasz has a Ph.D. and an M.Sc. from the Massachusetts Institute of Technology (MIT). He has been a lecturer at the Environmental Science and Policy Program at Johns Hopkins University, the Public Policy Program at Tsinghua University in Beijing and the National University of Singapore. He has co-edited the books “Sustainable Low-Carbon City Development in China” (World Bank, 2011), “Disruptive Technologies for Sustainable Development” (forthcoming, World Bank, 2023) and “Knowledge Management and Organizational Change” (forthcoming, Routledge Ed., 2023).

Kanyi Lui

Expert in international financing, project financing and restructuring, Kanyi Lui has almost two decades of experience advising multilateral lenders, major financial institutions, sponsors, and sovereigns and corporate borrowers on developing and financing energy, natural resource and infrastructure projects across the world. A recognized specialist in the financing of major infrastructure projects and China's “Belt-and-Road Initiative,” Kanyi has acted on several matters which helped shape the development of China's lending practices, including the world's first offshore RMB export credit financing facility, the world's first USD/Onshore RMB revolving credit facility and many groundbreaking sovereign and private debt restructurings. He is currently a partner and the head of China at the international law firm Pinsent Masons.

Tomas Magnusson

Magnusson has more than four decades of experience in public debt management focused on the institutional and legal framework, and is currently an independent advisor. He is the former Lead Financial Officer at the World Bank Treasury and Head of the Panel of Experts for the Debt Management Facility, a multi-donor trust fund managed by the World Bank. Magnusson spent twenty years at the Swedish National Debt Office, where he was General Counsel and Head of the Guarantee Department, Secretary of the Board, and member of the Directorate, the Credit Risk Committee and the Operational Risk Committee. Before that, he held a legal practice in various District and City courts and the Svea Court of Appeal. Was appointed Associate Judge of the Svea Court of Appeal in 1990. He has assisted a wide range of countries in improving the management of their public debt and guarantees, both on the sovereign and subnational levels, including Azerbaijan, Albania, Belize, Bosnia and Herzegovina, Bulgaria, Burundi, Cambodia, Cameroon, Central African Republic, Croatia, Cyprus, the Gambia, Grenada, Honduras, India, Iran, Iraq, Jordan, Kazakhstan, Kenya, Kosovo, Lao PDR, Madagascar, Malawi, Morocco, Nigeria, North Macedonia, Oman, Panama, Pakistan, Papua New Guinea, Poland, Samoa, Sao Tome and Principe, Saudi Arabia, Serbia, Sierra Leone, Suriname, Swaziland, Tanzania, Tunisia, United Arab Emirates, Vietnam, Ukraine, Uzbekistan, Zambia and Zimbabwe. In addition, he has trained several supreme audit institutions in conducting performance audits of government debt management.

Murray Petrie

Former New Zealand Treasury official with over four decades of experience advising governments on public finance. He has worked extensively as a consultant for the IMF and the World Bank on the management of fiscal risks, including the use of accounting to strengthen accountability; the management of contingent liabilities and PPPs; the development of good practice guidelines for the management of fiscal risks; management of fiscal risks from natural disasters; and has advised on the design of Part III of the 2014 IMF Fiscal Transparency Code on Fiscal Risk Analysis and Management. He has participated in technical cooperation missions on fiscal risk management in, among others, Indonesia, Thailand, Malaysia, the Maldives, Switzerland, the UAE, Colombia, and the Indian states of Tamil Nadu and Odisha. Murray has an MA (Hons) in Economics, a Master of Public Administration from Harvard and a PhD in Public Policy from Victoria University of Wellington, where he is a Senior Research Associate at the Institute of Governance and Policy Studies. He has published widely on public financial management and the management of fiscal risks.

Luis de la Plaza

De la Plaza is a former Lead Financial Officer at the World Bank's Treasury and coordinator of the World Bank's lending, debt management and financial advisory operations. He was responsible for developing and implementing tailored financial solutions for sovereign asset and liability management and coordinating the design and implementation of Disaster Risk Management strategies. Luis has extensive experience conducting training seminars on modern financial instruments,

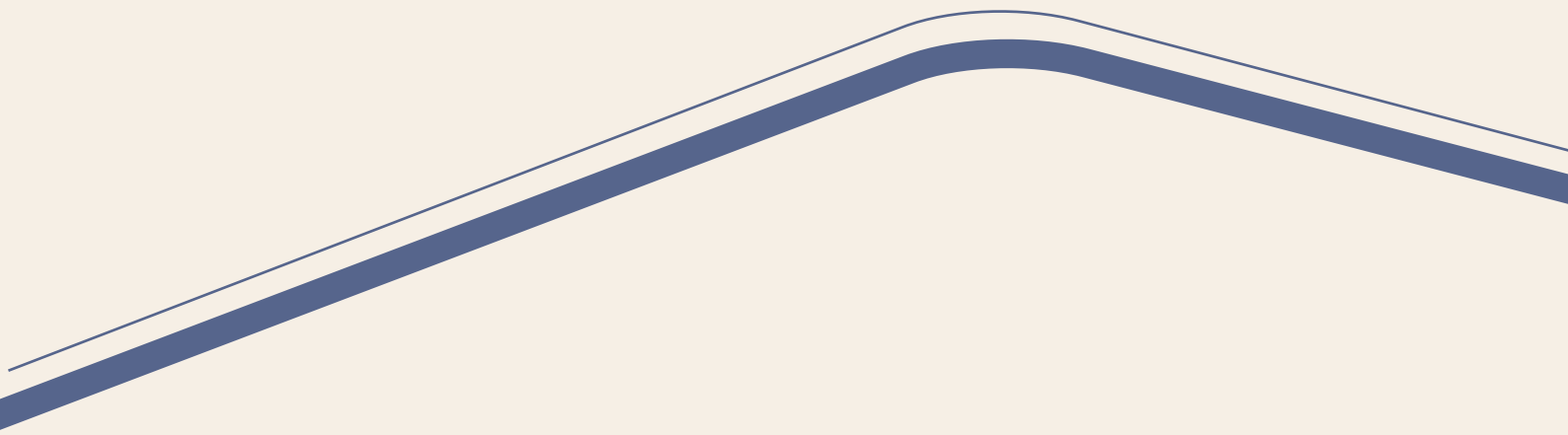
international financial markets and asset and liability management techniques and strategies for ministries of finance, debt management offices, central banks and financial sector regulators.

Juan Pradelli

Pradelli is a global expert in macroeconomic analysis, fiscal policy, government debt management, and public financial management, with extensive experience working for international financial institutions and government agencies. He is a former Senior Economist at the World Bank and the Inter-American Development Bank. He served as an advisor at Italy's Ministry of Economy and Finance and Argentina's Ministry of Economy. Since 2018, Mr. Pradelli has worked as an independent expert for the International Monetary Fund in the Middle East, the Caribbean and West Africa; the World Bank in China, India, Saudi Arabia, Peru, Nigeria, Poland and other countries; the Asian Development Bank in China, Indonesia, Pakistan and Lao PDR; the Inter-American Development Bank in Argentina; the African Development Bank in West Africa; McKinsey & Co International in Saudi Arabia; and Germany's Society for International Cooperation in Ukraine.

Antonio Velandia

Velandia has two decades of experience at the World Bank leading technical assistance programs to improve public debt and cash management in, among others, Colombia, Ukraine, Morocco, Tunisia, Peru, Vietnam and Romania. He has developed and delivered training courses on Sovereign Asset and Liability Management and conducted a preliminary SALM analysis in Paraguay. Velandia has led or participated in assessing and designing reform strategies for debt management in more than 20 countries and provided technical assistance to more than 15 client countries on debt management strategy, contingent liabilities, coordination with monetary policy, domestic bond market, legal and institutional arrangements, credit risk arising from government guarantees and on-lending, operational risk, external debt audit, international market access, debt management transparency, stakeholder relationship management, and cash and liability management operations. He has designed and conducted training courses for client countries on debt management strategies and methodologies for quantifying risk in a public debt portfolio. Velandia has over a decade of experience as a Vice-President for International Monetary Affairs and Head of the Reserves Management Division at Colombia's Central Bank.





Sustainable Financing For Development And Infrastructure
A practical handbook for borrowers and lenders on what works,
what doesn't, and why, at each step of the sovereign borrowing process

