

edited by
S. ALI ABBAS, ALEX PIENKOWSKI,
AND KENNETH ROGOFF

SOVEREIGN DEBT



A Guide for Economists
and Practitioners

OXFORD

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Foreword

Since the 1980s Latin America Debt Crisis, the International Monetary Fund has played a central role in preventing and resolving sovereign debt crises. We have supported our members regain debt sustainability and market access through liquidity support, and facilitated official and private sector coordination in the provision of new money and debt relief. This is the Fund's powerful 'catalytic role' in helping countries in crisis.

The IMF has also led in sovereign debt research and innovation. The development of historical debt databases, the advances in debt sustainability analytics, the evolution of the Fund's lending framework (not to mention the extensive research underlying it), and the promotion of collective-action clauses, have all supported efforts to prevent, and more efficiently resolve, sovereign debt crises.

The need for a clear understanding of the opportunities and risks associated with sovereign debt has never been greater than today. Public debt has ballooned since the global financial crisis and the creditor base has become more fragmented and complex. Many countries are facing vulnerabilities, and new crises will occur, as they have many times in the past. Each crisis reminds us of some old problems, but it also highlights new challenges.

This book provides a stock-take of the perennial issues—what motivates debt accumulation; how should debt be monitored, recorded and managed; and what strategies are available to reduce debt, and where needed, restructure it. It also seeks to identify new problems, for example, the issue of debt transparency, where obligations are hidden or the terms are opaque; or the growing number of official sector creditors that may make it more difficult to coordinate timely debt relief when needed.

In many cases, there is currently no consensus on the appropriate policy response. Indeed, sovereign debt is a complex field where economic and legal thinking is evolving rapidly, with potentially profound effects on the lives of many people.

This underscores the need for the IMF to be continuously learning and innovating to remain at the frontier of the subject, notwithstanding our substantial expertise accumulated through our involvement in four decades worth of debt crises. Accordingly, this publication pulls together contributions by

leading experts on sovereign debt across a range of disciplines—economics, law, history and finance.

This guide is designed to provide a foundation for understanding sovereign debt that will be useful to academics, practitioners, and policymakers alike. I hope you find it as interesting and informative as I did.

Christine Lagarde

Managing Director, International Monetary Fund

July 2019

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Editors Bios

S. Ali Abbas:

Ali Abbas is deputy chief of the Debt Policy division in the Strategy, Policy, and Review department of the International Monetary Fund. He has led key reforms to the Fund's lending and crisis resolution frameworks; served as Fund liaison to the Paris Club; and been closely involved in several exceptional access Fund-supported programs, including Ireland 2010, Ukraine 2015, and Argentina 2018. He has published on fiscal policy, government financing, and sovereign debt crises, and helped compile widely-used databases on the level, dynamics and composition of public debt. Ali has a D-Phil in Economics from the University of Oxford (where he was a Rhodes Scholar) and served as an Overseas Development Institute fellow in Tanzania.

Alex Pienkowski:

Alex Pienkowski is an economist in the European department of the International Monetary Fund with a focus on sovereign debt, in particular the resolution architecture for debt crises, the costs and benefits of state-contingent debt and the propagation of shocks during crises. He has worked on a range of countries including Portugal, Argentina, Ukraine and Mongolia. Prior to the IMF, Alex worked for the Bank of England for five years. He specialised in international issues in both the financial stability and monetary analysis departments of the Bank. Much of his time involved working on the euro area sovereign debt crisis. Alex was also an Overseas Development Institute fellow in Malawi between 2007–09.

Kenneth Rogoff:

Kenneth Rogoff is Thomas D. Cabot Professor at "<http://www.harvard.edu/>" Harvard University. From 2001–2003, Rogoff served as Chief Economist at the "<http://www.imf.org/external/index.htm>" International Monetary Fund. His widely-cited 2009 book with "<http://www.carmenreinhardt.com/>" Carmen Reinhart, "<http://www.reinhartandrogoff.com/>" *This Time Is Different: Eight Centuries of Financial Folly*, shows the remarkable quantitative similarities across time and countries in the run-up and the aftermath of severe financial crises. Rogoff is also known for his seminal work on exchange rates and on central bank independence. Together with Maurice Obstfeld, he is co-author of "<https://mitpress.mit.edu/books/foundations-international-macroeconomics>" *Foundations of International Macroeconomics*, a treatise that has also become a widely-used graduate text in the field worldwide. Rogoff's 2016 book "<http://press.princeton.edu/titles/10798.html>" *The Curse of Cash* looks at the past, present and future of currency from standardized coinage to crypto-currencies and central bank digital currencies. The book argues that although much of modern macroeconomics abstracts from the nature of currency, it in fact lies at the heart of some

of the most fundamental problems in monetary policy and public finance. His monthly syndicated column on global economic issues is published in over 50 countries. Rogoff is an elected member of the "<http://www.nasonline.org/>" National Academy of Sciences, the "<https://www.amacad.org/default.aspx>" American Academy of Arts and Sciences, and the HYPERLINK "<http://www.group30.org/>" Group of Thirty, and he is a senior fellow at the "<http://www.cfr.org/about/membership/roster.html>" Council on Foreign Relations. Rogoff is among the top ten on RePEc's ranking of economists by scholarly citations. He is also an international grandmaster of chess.

List of Contributors

Julianne Ams is counsel in the Legal Department of the International Monetary Fund, providing legal advice to the IMF teams working with member countries across regions and income levels. Her practice also covers legal issues relating to the IMF's surveillance over members' economies and the international monetary system; governance and corruption; and trade policy. Prior to joining the IMF, Julianne was in private practice at Debevoise & Plimpton LLP in New York, where she focused on litigation and international commercial arbitration. Julianne holds a juris doctorate from Harvard Law School and a bachelor's degree in international relations and Japanese from the University of Virginia. She previously worked in Japan as an interpreter.

Serkan Arslanalp is a deputy division chief in the Strategy, Standards, and Review division of the IMF's Statistics Department. Prior to this, he worked in the Regional Studies Division of the Asia and Pacific Department and the Global Markets Analysis Division of the Monetary and Capital Markets Department. Mr. Arslanalp joined the Fund in 2004 and has worked on various country assignments, including Japan and Ukraine. He has contributed to the Asia and Pacific Regional Economic Outlook and the Global Financial Stability Report on issues related to demographics, financial markets, China spillovers, sovereign risk, and financial stability. Arslanalp holds a Ph.D. in economics from Stanford University and an undergraduate degree in economics from MIT.

Reza Baqir is a Pakistani economist who serves as the twentieth and current Governor of the State Bank of Pakistan. He previously worked in several high-profile roles in the IMF, most recently as senior resident representative to Egypt. During his time at the Fund he also led several critical reforms on assessing debt sustainability and the Fund's lending architecture. He holds degrees from Harvard University and the University of California, Berkeley.

Wolfgang Bergthaler is senior counsel at the IMF's Legal Department, where he advises on legal aspects of IMF financing operations, surveillance, exchange system, and financial sector issues, as well as sovereign debt, corporate and household insolvency, and debt enforcement issues. Before joining the IMF in 2006, he practiced as an attorney in international law firms in the area of corporate law and mergers and acquisitions, and capital markets law in Vienna and Brussels. Wolfgang is a graduate of Karl-Franzens Universitaet Graz (Magister iuris and Doctor iuris), Georgetown University Law Center (LL.M.), and the Université III Robert Schuman, Strasbourg (Certificate Erasmus). Wolfgang is admitted to practice in the State of New York and the District of Columbia, and has been admitted to practice in Vienna, Austria.

He regularly lectures in the United States and Europe and frequently publishes on issues related to IMF operations and legal aspects of international finance.

Tom Best is an economist in the IMF's Strategy, Policy and Review Department, where his current work focuses on sovereign debt issues, including the Fund's debt sustainability frameworks. Prior to the IMF, he spent four years at the Bank of England, working in the International and Monetary Analysis departments. He holds undergraduate and masters degrees from the University of Cambridge.

Hugh Bredenkamp has been a Deputy Director in the Strategy, Policy and Review Department of the IMF since 2008. He began his career as an economic advisor to the UK Treasury from 1982 to 1988. Since joining the IMF, he has worked on countries in Western Europe, the former Soviet Union, Asia, and Africa, where he was mission chief for Ghana. He was the Fund's senior resident representative in Turkey from 2004 to 2007. On the policy side, he helped develop the international debt relief initiative for low-income countries in the mid-1990s, and has supervised work on various reforms of the Fund's lending facilities and on sovereign debt issues.

Lee Buchheit has enjoyed a legal career spanning forty-three years, during which time he has worked on the sovereign debt restructurings of over two dozen countries including the Philippines, Ecuador, Russia, Iraq, and Greece. He is the author of two books in the field of international law and a co-editor of the volume "Sovereign Debt Management". Buchheit is an Honorary Professor at the University of Edinburgh Law School, a Visiting Professor at the Centre for Commercial Law Studies in London and a Non-resident Fellow at the Columbia University Law School.

Oliver Bush is a Ph.D. candidate in economic history at the London School of Economics. He has previously worked at the CBI and the Bank of England and studied at the Universities of Oxford, London, and California at Berkeley. His current research interest is twentieth-century British macroeconomic history.

Guillaume Chabert is a graduate from the leading French engineering school Ecole Centrale de Paris, the Paris Institute of Political Studies, and the French Senior Civil Service School (ENA). In 2000 he embarked on his career at the Directorate General for Local Government at the French Ministry of the Interior, before joining the Directorate General of the Treasury at the French Ministry of Finance in 2004. In 2010, Chabert was appointed G20 Project Manager heading up the team coordinating the 2011 French Presidency of the G20 (and G7/G8) at the Directorate General of the Treasury. Following two years in Stockholm, where he managed the Regional Department of Economic Affairs for the Nordic countries, he was assigned Adviser to the Prime Minister, in charge of the Economy, Finance and Business, in September 2013. In 2014, he was appointed Deputy Chief of Staff of the Minister of Finance. In 2015, Chabert took up his present position as Assistant Secretary for Multilateral Affairs, Trade and Development Policies at the Directorate General of the Treasury. He is also Co-Chair of the Paris Club and G20/G7 Financial Sous-Sherpa for France.

Xavier Debrun is an advisor in the Research Department of the National Bank of Belgium. He completed his Ph.D. in international economics at the Graduate Institute of International Studies in Geneva, before joining the IMF in 2000, working mostly in the Fiscal Affairs and Research Departments. In 2006–07, he was a Visiting Fellow at Bruegel in Brussels and a Visiting Professor of Economics at the Graduate Institute. His research interests include international policy coordination, currency unions, and macro-fiscal issues, notably fiscal policy rules, the stabilizing role of fiscal policy, and public debt sustainability. His work has been published in IMF flagship series, conference volumes, and professional journals.

Chanda DeLong is a senior counsel in the Legal Department of the IMF, where she advises member countries and staff on the law and policies of the IMF. Her particular areas of focus include sovereign debt restructuring, corporate and household insolvency, and the IMF's lending policies. Prior to work at the IMF, DeLong worked at the US SEC. She has a J.D. from the University of Pennsylvania Law School and a B.A. in Russian Literature from Princeton University.

Barry Eichengreen is the George C. Pardee and Helen N. Pardee Professor of Economics and Professor of Political Science at the University of California, Berkeley, where he has taught since 1987. He is a Research Associate of the NBER (Cambridge, MA) and Research Fellow of the CEPR (London). In 1997–98 he was Senior Policy Advisor at the IMF. He is a fellow of the American Academy of Arts and Sciences (class of 1997). Eichengreen is the convener of the Bellagio Group of academics and economic officials and chair of the Academic Advisory Committee of the Peterson Institute of International Economics. He has held Guggenheim and Fulbright Fellowships and has been a fellow of the Center for Advanced Study in the Behavioral Sciences (Palo Alto) and the Institute for Advanced Study (Berlin). He is a regular monthly columnist for Project Syndicate and has written and edited a number of books. He was awarded the Economic History Association's Jonathan R.T. Hughes Prize for Excellence in Teaching in 2002 and the University of California at Berkeley Social Science Division's Distinguished Teaching Award in 2004. He is also the recipient of a doctor honoris causa from the American University in Paris.

Asmaa El-Ganainy is a Deputy Division Chief at the IMF's Institute for Capacity Development (European and Middle Eastern Division). Previously, she contributed to the IMF's surveillance, lending, research, and capacity development work at the European and Fiscal Affairs Departments. Her experience has covered a wide range of countries, including advanced, emerging, and low-income countries. She has also contributed to the IMF's work on several crisis cases, including Greece at the height of the 2010 European sovereign debt crisis. She has published in the fields of fiscal policy, labor economics, and economic growth, including in the journal of *International Tax and Public Finance*, and the *IMF Economic Review*. El-Ganainy holds a Ph.D. in economics from Georgia State University (USA).

Rui Esteves is Associate Professor at the Graduate Institute in Geneva. He specializes in monetary and financial history, straddling the fields of international finance,

institutional economics and public finance. His research provides perspective on the globalization of finance, financial crises, sovereign debt, financial market architecture, and exchange rate regimes, as well as rent-seeking and corruption in public office.

Luc Eyraud is deputy division chief in the African Department of the IMF. He spent a large part of his career working on fiscal issues in the IMF Fiscal Department, where his research focused mostly on fiscal multipliers, fiscal rules, and fiscal decentralization. Prior to joining the IMF, Luc Eyraud worked at the French Treasury in the macroeconomic analysis department.

Antonio Fatás is the Portuguese Council Chaired Professor of Economics at INSEAD, a Senior Policy Scholar at the Center for Business and Public Policy at the McDonough School of Business (Georgetown University, Washington DC), a Research Fellow at the CEPR (London), and a Senior Fellow at ABFER (Singapore). He was the Dean of the MBA programme at INSEAD from September 2004 to August 2008. He received a Masters and Ph.D. in Economics from Harvard University. He has worked as an external consultant for the IMF, the World Bank, the Board of Governors of the US Federal Reserve, the OECD, and the UK government. His research covers areas such as the macroeconomic effects of fiscal policy and the connections between business cycles and growth and has been published in several leading academic journals.

Anna Gelpern is a Professor of Law at Georgetown and a non-resident senior fellow at the Peter G. Peterson Institute for International Economics. She has published research on government debt, contracts, and regulation of financial institutions and markets. She has co-authored a law textbook on international finance, and has contributed to international initiatives on financial reform and government debt.

Atish Rex Ghosh is the IMF Historian. Formerly, Assistant Director, and Chief, Systemic Issues Division, Research Department, his previous assignments at the IMF have included work on the Ukrainian (1994–97) and Turkish (1998–99) stabilization programs. He works on issues related to the stability of the international monetary system, including exchange rate regimes, external balance dynamics, capital flows, and monetary, exchange rate, and fiscal policies. He was Assistant Professor of Economics and International Affairs, Princeton University, and he holds degrees from Harvard University and Oxford University. He has published numerous articles and several books on open economy macroeconomics and international finance. Ghosh is also the author of a novel.

Ricardo Hausmann is Director of Harvard's Center for International Development and Professor of the Practice of Economic Development at the Kennedy School of Government. Previously, he served as the first Chief Economist of the Inter-American Development Bank (1994–2000), where he created the Research Department. He has served as Minister of Planning of Venezuela (1992–93) and as a member of the Board of the Central Bank of Venezuela. He also served as Chair of the IMF-World Bank Development Committee. Hausmann was Professor of Economics at the Instituto de Estudios Superiores de Administracion (IESA) (1985–91) in Caracas, where he

founded the Center for Public Policy. His research interests include issues of growth, macroeconomic stability, international finance, and the social dimensions of development. He holds a Ph.D in economics from Cornell University.

Thordur Jonasson is a Deputy Division Chief in the Debt and Capital Market Instruments Division in the IMF Monetary and Capital Markets Department. Prior to joining the IMF, he was a Senior Securities Markets Specialist in the Global Capital Markets Practice of the World Bank working on developing public and private debt markets and participating in the Financial Sector Assessment Program (FSAP). He has also been an expert on public debt management and debt market development for the IMF, World Bank, and the Commonwealth Secretariat participating in technical assistance and financial sector assessment missions. His professional experience also includes the National Debt Management Agency in Iceland where he worked in different capacities until appointed Chief Executive. Jonasson has also held positions in the private sector as an advisor to municipalities and state-owned corporations on debt management, treasury, and international funding. He has published on capital market development and debt management.

Kris James Mitchener is the Robert and Susan Finocchio Professor of Economics at Santa Clara University, Research Associate at the NBER and the Centre for Competitive Advantage and the Global Economy (CAGE), and Research Fellow at the CEPR and CESifo. His research focuses on economic history, international economics, macroeconomics, and monetary economics, and he is a leading expert on the history of financial crises. Prior to his current positions, he was professor of economics at the University of Warwick, and has held visiting positions at the Bank of Japan, the Federal Reserve Bank of St. Louis, UCLA, and CREi at Universitat Pompeu Fabra. He is the editor of *Explorations in Economic History* and serves on the editorial boards of other academic journals. He received his B.A. and Ph.D. from the University of California, Berkeley.

Jonathan D. Ostry is Deputy Director of the Research Department at the IMF and a Research Fellow at the CEPR. His recent responsibilities include leading staff teams on: IMF-FSB Early Warning Exercises on global systemic macrofinancial risks; vulnerabilities exercises for advanced and emerging market countries; multilateral exchange rate surveillance, including the work of CGER, the Fund's Consultative Group of Exchange Rates, and the External Balance Assessment; international financial architecture and reform of the IMF's lending toolkit; capital account management and financial globalization issues; fiscal sustainability issues; and the nexus between income inequality and economic growth. Past positions include leading the division that produces the IMF's flagship multilateral surveillance publication, the *World Economic Outlook*, and leading country teams on Australia, Japan, New Zealand, and Singapore. Ostry is the author of a number of books on international macro policy issues and numerous articles in scholarly journals and he has been widely cited in print and electronic media. His work on inequality and unsustainable growth has also been cited in remarks made by President Barack Obama. He earned his B.A. from

Queen's University (Canada) at age 18, and went on to earn a B.A. and M.A. from Oxford University, and graduate degrees from the London School of Economics and the University Chicago. He is listed in *Who's Who in Economics* (2003).

Ugo Panizza is Professor of International Economics and Pictet Chair in Finance and Development at the Graduate Institute Geneva. He is also the director of the Institute's Centre for Finance and Development, Director of the International Centre for Monetary and Banking Studies (ICMB), Vice President of CEPR, Fellow of the Fondazione Einaudi, and Editor of *International Development Policy*. Previously, he was Chief of the Debt and Finance Analysis Unit at UNCTAD and worked at the Inter-American Development Bank and the World Bank, alongside holding teaching and research posts at the American University of Beirut and the University of Turin.

Michael G. Papaioannou serves as a TA Expert-Advisor at the IMF and is a Visiting Scholar and Professor at the LeBow College of Business, School of Economics, Drexel University. He was a Deputy Division Chief at the Debt and Capital Markets Instruments, Monetary and Capital Markets Department of the IMF until July 2017. While at the IMF, he served as a Special Adviser to the Governing Board of the Bank of Greece and led numerous IMF missions on developing economic and financial policies for emerging market and developed economies, designing and implementing sovereign asset and liability management frameworks, developing local currency government bond markets and instruments, and establishing and managing SWFs. Prior to joining the IMF, he was a Senior Vice President for International Financial Services and Director of the Foreign Exchange Service at the WEFA Group (Wharton Econometrics Forecasting Associates), served as Chief Economist of the Council of Economic Advisors of Greece, and holding teaching posts at Temple's FOX School of Business and the University of Pennsylvania. Papaioannou holds a Ph.D. in Economics from the University of Pennsylvania and an M.A. in Economics from Georgetown University, and has published extensively in the area of international finance.

Alex Pienkowski is an economist in the European department of the International Monetary Fund with a focus on sovereign debt, in particular the resolution architecture for debt crises, the costs and benefits of state-contingent debt and the propagation of shocks during crises. He has worked on a range of countries including Portugal, Argentina, Ukraine, and Mongolia. Prior to the IMF, Pienkowski worked for the Bank of England for five years. He specialized in international issues in both the financial stability and monetary analysis departments of the Bank. Much of his time involved working on the euro area sovereign debt crisis. Pienkowski was also an Overseas Development Institute fellow in Malawi between 2007 and 2009.

Andrea F. Presbitero is an economist of the IMF Research Department's Macro-Financial Division. Before joining the Fund, he was assistant professor at the Università Politecnica delle Marche (Italy). He is an applied economist who primarily works on banking and development finance. His research interests also include monetary policy, international finance, and fiscal policy. His work has been published

in a range of academic journals and he is Associate Editor of the *Journal of Financial Stability and Economia* (LACEA).

Carmen M. Reinhart is the Minos A. Zombanakis Professor of the International Financial System at Harvard Kennedy School. She was Senior Policy Advisor and Deputy Director at the IMF and held positions as Chief Economist and Vice President at the investment bank Bear Stearns in the 1980s. Reinhart serves in the Advisory Panel of the Federal Reserve Bank of New York, and was a member of the Congressional Budget Office Panel of Economic Advisors. She has written on a variety of topics in macroeconomics and international finance and her work has helped to inform the understanding of financial crises in both advanced economies and emerging markets. Based on publications and scholarly citations, Reinhart is ranked among the top economists worldwide according to Research Papers in Economics (*RePec*). She has testified before congress and has been listed among *Bloomberg Markets Most Influential 50 in Finance*, *Foreign Policy's* Top 100 Global Thinkers, and *Thompson Reuters' The World's Most Influential Scientific Minds*. In 2018 Reinhart was awarded the King Juan Carlos Prize in Economics and NABE's Adam Smith Award, among others.

M. Belen Sbrancia is an economist at the IMF who received her Ph.D. from the University of Maryland. Sbrancia's research interests are mostly related to debt issues, especially the role of financial repression in reducing debt and sovereign debt restructuring mechanisms. During her years at the IMF she has worked on a variety of topics/countries, but most recently on vulnerable countries such as Argentina, Lebanon, Ukraine, and now Venezuela.

Philip Stokoe is a senior economist in the IMF Statistics Department Government Finance Division. He has an in-depth knowledge of the international statistical and accounting guidance for the measurement of sovereign debt and is an expert in the measurement of the government and public sector balance sheets, debt, revenues, expenditures, and related issues. His current role includes analysis of country fiscal data, as well as providing training and technical assistance in fiscal statistics to country authorities. Stokoe has been with the IMF for five years, but prior to this worked for the UK Office for National Statistics on classification and related issues for the UK Public Sector Finances and National Accounts. During his time at ONS, he was part of the Government Finance Statistics Advisory Committee that contributed to the production of the IMF Government Finance Statistics Manual 2014, and was a vocal participant in Eurostat-led discussions to provide new and improved guidance on government deficit and debt for EU member states. Stokoe's career in statistics followed a decade in economic and regeneration consultancy as a consumer of macro-economic statistics for a range of public and private sector clients. He graduated with a degree in economics and politics from Lancaster University in the UK.

Alexander F. Tieman is deputy division chief in the IMF's Fiscal Affairs Department. In this capacity he co-manages a division consisting of around twenty economists and support staff. In addition, Tieman works on various cross-country and analytical

projects. His seventeen-year experience at the IMF include a work on program and surveillance countries; financial sector surveillance and stress testing; and a field assignment as IMF Resident Representative in Skopje, North Macedonia. Prior to joining the Fund, he lectured in microeconomics at the Vrije University and Tinbergen Institute in Amsterdam, the Netherlands and worked at the research department of the Dutch Central Bank. He has a Ph.D. in microeconomics from the Vrije University/Tinbergen Institute in the Netherlands.

Christoph Trebesch is a Professor of Economics at the University of Kiel and at the Kiel Institute for the World Economy, where he heads the Research Area “International Finance and Global Governance”. Before coming to Kiel, he was an Assistant Professor at the University of Munich and completed his Ph.D. at the Free University of Berlin, with research stays at Yale and at the IMF. His research focuses on international finance and international macroeconomics, economic history, and political economy.

Tim Willems is an economist in the Debt Policy Division (within the Strategy, Policy, and Review Department) of the IMF. He joined the IMF in 2015, after having spent three years as a post-doctoral research fellow at Nuffield College, University of Oxford. Prior to that, he obtained his Ph.D. from the University of Amsterdam, whilst also spending time at the Dutch Central Bank and the Central Bank of Sweden. His research has been published in a variety of academic journals.

Mike Williams established the UK Debt Management Office as its first CEO in 1998. Prior to that he worked for nearly twenty-five years in the UK Treasury. Since leaving the DMO in early 2003, Mike Williams has worked as an independent consultant on government debt and cash management. Through the IMF, World Bank, and others, he has worked extensively with governments across most regions of the world, in particular on debt management policies, and institution and capacity building; on government bond market development; and on developing a more efficient and proactive approach to the management of the government’s cash.

Charles Wyplosz is Emeritus Professor at the Graduate Institute in Geneva where he was Director of the International Centre for Money and Banking Studies. Previously, he has served as Associate Dean for Research and Development at INSEAD, as Director of the Ph.D. program in Economics at the Ecole des Hautes Etudes en Science Sociales in Paris and as Policy Director of the CEPR. His main research areas include financial crises, European monetary integration, fiscal policy, and regional monetary integration. He is the co-author of two leading textbooks and has published several books and many professional articles. He has served as consultant to many international organizations and governments and is a frequent contributor to public media. A French national, Wyplosz holds a degree in Engineering from Ecole Centrale, Paris, and a Ph.D. in Economics from Harvard University. He has been awarded the title of Chevalier de la Légion d’Honneur.

Jeromin Zettelmeyer is the Dennis Weatherstone Senior Fellow at the Peterson Institute for International Economics, a CEPR research fellow, and a member of

CESIfo. From 2014 until September of 2016, he served as Director-General for Economic Policy at the German Federal Ministry for Economic Affairs and Energy. Previously, he was Director of Research and Deputy Chief Economist at the European Bank for Reconstruction and Development (2008–14), and a staff member of the IMF (1994–2008), where we worked in the Research, Western Hemisphere, and European departments. He holds degrees from the University of Bonn and a Ph.D. from MIT. His research interests include financial crises, sovereign debt, and economic growth.

Introduction

Not since the aftermath of the Second World War has the topic of sovereign debt taken such importance in public policy debate. Reeling from the effects of the Global Financial Crisis, public debt-to-GDP ratios in advanced economies are at levels not seen in over half a century.¹ Debt vulnerabilities are on the rise in many emerging markets, with some in outright default, and others facing non-trivial financing pressures. And the World Bank and the IMF assess more low-income countries to be in, or at high risk of, debt distress than at any time since the official debt relief operations of the 2000s. The need to place this difficult conjuncture into historical context, identify its unique aspects, and discuss options for the future, constitutes our first motivation for compiling this book.

This work also seeks to highlight the important distinctions *within* each country group. Indeed, among advanced economies, the constraints facing the United States, a reserve currency issuer, are quite different from those of, say, Portugal which cannot print its own currency. Among emerging markets, the challenges facing resource-rich Saudi Arabia are vastly different than those facing a diversified economy such as the Philippines. Similarly, the policy trade-offs facing Ethiopia, a large and growing economy, are not the same as those facing Grenada, a small island state vulnerable to natural disasters.

It is also the case that some policy questions apply to all countries: How can countries build buffers to deal with the next stress episode when they have yet to fully recover from the last? How can an aging population be supported without over-burdening future generations? How can spillovers from debt crises be reduced without encouraging greater risk taking in the future? And how can economies achieve their longer-term sustainable development goals without ending up with excessive debt? These are issues that interest policymakers, business people, and researchers alike. But they cannot be

¹ Throughout this volume, the terms sovereign debt and public debt are used interchangeably. This represents a departure from usage of these terms in some earlier literature, where sovereign debt was associated with a country's total external debt, while public debt connoted a government's local currency debt.

satisfactorily answered without a holistic understanding of sovereign debt. This provides a second motivation for the book.

Our final motivation comes from the surprising observation that until now, there has been no attempt to combine these various themes on sovereign debt into a single volume, much less one that is accessible to non-specialists. To be clear, the volume of academic and policy work on this topic is huge, with many books and papers covering key sub-disciplines in detail, such as: the drivers and motives of debt accumulation; how to assess debt sustainability; the importance of sound debt management; and the history and theory of sovereign default. Yet to our knowledge, this is the first attempt to assemble these various components into a single text; and one that is designed to be accessible to both academics and practitioners alike. Stitching the individual sovereign debt threads into a single text is not just a matter of convenience. It is a pre-requisite for understanding vital inter-relationships between the various threads, for example: the role of debt management in improving debt sustainability; the interplay between the motives to borrow and effective policies to reduce excessive debt; or how history has shaped our current institutional architecture for effectively (or not so effectively) resolving debt crises. Only with a sound grasp of these and other inter-relationships can one assert a command over any individual sovereign debt sub-topic.

Importantly, understanding of such issues must not be the exclusive preserve of “experts.” Sovereign debt is one of those issues in public policy that is prone to much misunderstanding and abuse; where the substance of the matter is often lost between methodology and ideology. A couple of examples, as follows, can demonstrate this.

First, the costs and benefits of accumulating, repaying and managing debt are not evenly shared between agents, creating incentives for biased analytics by different interest groups. For example, sound borrowing and investment in human and physical capital today can lead to a better quality of life for future generations; but excessive and inefficient borrowing can leave a legacy of debt and austerity for decades to come. Similarly, political decision-makers may borrow and spend in ways that provide little benefit to the taxpayers that must eventually service and repay this debt. Fiscal policy fundamentally implies political choices—choices that may sometimes bias leaders to use debt excessively either to preserve power (for example, in pre-election spending binges) or to transfer as much of those resources as possible to favored groups before falling out of power. And even when policymakers have the best of intentions, if things go wrong, it is the often the poorest in society that suffer most. Thus, fomenting a balanced, impartial discussion of the wisdom or otherwise of

public finance decisions, requires a broad understanding of these, and other, trade-offs.

Second, when a sovereign faces a debt crisis, any resolution decision is likely to be contentious. Sovereign defaults can be systemic events, paralleled only by the collapse of a large financial system. Here, spillovers can destabilize financial markets and other sovereigns, especially in interconnected systems, such as the euro area. To avoid broader damage, global policymakers may be tempted to “throw money” at a distressed sovereign and “bail-out” its creditors in order to avoid the immediate costs of a restructuring or default. But this can increase the burden on taxpayers (both of that country, and globally), and the resulting discontent can itself lead to political and economic instability. Despite the push for contracts that incentivize collective action on the part of creditors, sovereigns can still find themselves hostage to “hold-outs” that is, creditors that seek to stay out of a resolution deal in the hope that they can be paid in full while others provide debt relief. The inability of global policymakers to fully tackle this problem has meant that decisions to “bail-in” (rather than “bail-out”) creditors remains difficult. Making sense of modern-day sovereign debt crises requires familiarity with these architectural realities and diverse incentives.

In sum, a broad understanding of sovereign debt, grounded in extensive cross-country analysis over time, is needed to engender a balanced and constructive dialogue on some of the most important policy questions of today. To this end, this book offers a succinct and accessible treatment of all major sovereign debt themes for academics, practitioners, and policymakers alike. The book brings together some of the world’s leading researchers and specialists in sovereign debt. When inviting authors to contribute, we tried to target a mix of skills and disciplines, with a view that such cross-pollination is the best way to get new perspectives and ensure that ideas are accessible to readers of all backgrounds.

The book’s authors have been urged to avoid using economic or legal jargon, to minimize equations, and to make extensive use of real-world examples to illustrate points. If there is one overarching objective of the book, it is to make clear that issues regarding sovereign debt can be complicated and multi-dimensional, but not intractable. Accordingly, throughout the book we have urged authors to offer practical policy advice in a way that is accessible to all readers. The chapters of the book are structured to follow an intuitive sequence, with certain narratives built throughout the text. Despite this, chapters can also be read in isolation, with only the occasional need to cross-reference different chapters.

Chapter 1 provides a history of sovereign debt from the Middle Ages to the Global Financial Crisis. It explores the role of sovereign debt in building, and defending, kingdoms and city-states, examining the role of trust and institutions in deepening the market for such debt. It charts how, as the legitimacy of governments grew, borrowing was increasingly used to finance infrastructure and current spending, rather than just wars. The chapter takes a close look at some of the great build-ups in debt, contrasting the Great Depression with the Great Recession. It also looks at how debt has been reduced, and how various policies have supported, or acted against, these debt reductions. History has a habit of repeating itself, so the chapter concludes with some lessons for policy-makers today. Chapter 2 focuses on the present, starting with a detailed discussion on what exactly is sovereign debt. It shows the surprisingly large variation in definitions, and how the choice of institutional coverage, instrument type, or valuation method can lead to widely different numbers. In the United States for example, debt could be anywhere between US\$20–75 trillion, depending on which definition is used. Debt is then placed in context to the rest of the sovereign's balance sheet, exploring how other assets and liabilities (current or future, explicit or contingent) can impact our view of a country's indebtedness. Finally, the chapter takes a snapshot of the world's major creditors and debtors today, and explores how this landscape has shifted in recent years.

Chapter 3 takes a step back to consider *why* sovereigns borrow, and what explains the often-high level of debt seen in many countries today. Some of these motives are “good,” such as to support growth in a recession or to finance human and physical capital. Nevertheless, high debt in many countries can also be attributed to political failures and intergenerational transfer problems. In addition, the chapter looks at the debt overhang problem, and whether very high debt is associated with lower trend growth. The past decade of research has largely confirmed Reinhart and Rogoff's² conjecture that the answer is “yes,” in part because countries with very high debt have less flexibility in using countercyclical fiscal policy in dealing with recessions, financial crises, and other exigencies. Reinhart and Rogoff carefully avoid claiming causation, which is a much more difficult issue and an active area of research. The issue of whether inherited high debt weighs on growth is not to be confused (as many polemicists do) with whether being able to run fiscal deficits can temporarily raise growth (where there is little debate that the answer is yes, at least qualitatively).

² Carmen M. Reinhart and Kenneth S. Rogoff, 2010a, “Growth in a Time of Debt,” *The American Economic Review*, 100(2), 573–8.

Chapter 4 considers debt sustainability, a theoretically difficult concept, which is even harder to pin down empirically. The chapter starts by considering how debt sustainability is defined, an inherently forward-looking concept, which ultimately rests on assumptions about what policies a government is able (or perhaps willing) to pursue to maintain sustainability. Of course, the trend decline in global real interest rates, which took another major step down after the 2008 financial crisis, implies higher borrowing capacity, other things being equal, should the trend be sustained. But as the chapter explores, countries must be prepared for the possibility it might not be—the risk of not being able to roll over debt in a crisis can be mitigated through longer-term borrowing, as discussed in Chapter 5, Debt Management. The chapter concludes with a survey of the latest techniques to assess debt sustainability, which combine forward-looking theory with backward-looking empirics.

Chapter 5 explores the important role of debt managers in enhancing sustainability. Ultimately debt management is about balancing the trade-off between the cost of issuance and the riskiness of a country's debt structure. The chapter sets out the criteria that governments should consider when making decisions on the currency, maturity, or interest rate structure of its debt, including the potential barriers faced by some issuers, especially low-income countries. It then goes beyond these traditional objectives and looks at the impact of the debt structure on monetary policy, capital market deepening, and public cash management. Chapter 6 focuses on policies to reduce debt that do not involve a debt restructuring. This includes conventional policies, such as fiscal consolidation and promoting growth, as well as less orthodox strategies such as using monetary policy and financial repression. History shows that all of these strategies have been used in the past, and each have different costs associated with them. As well as summarizing the various options available to policymakers, the chapter emphasizes that there is no “one-size-fits-all” strategy, with country-specific factors (cyclical position, institutional quality, openness of the economy, etc.) playing an important role in determining policy design.

Chapter 7 is dedicated to sovereign default, its causes and consequences. The chapter begins with the problem of how to define default—the range of defaults used in the literature is a wide spectrum of events that can have very different economic consequences. This chapter is a fruitful collaboration between legal scholars and economists; and tries to clarify some of the tension between how lawyers define a default event, and economists, who, for example, tend to view a “voluntary” renegotiation of debt as tantamount to a unilateral default, minus some deadweight costs. Once this typography is

established, the chapter explores *why* a default might occur, looks at the role of mismanagement and misfortune, and also the extent to which these events can be “self-fulfilling.” Finally, the cost of default is explored, alongside potential policies that can mitigate it. Chapter 8 continues with the theme of sovereign default but focuses on the process itself. It gives a “play book” on how a country might approach a debt restructuring, something that to our knowledge has not been done before. The chapter gives an overview of the various processes and institutions that need to be navigated, and also the “carrots” and “sticks” that can be used to incentivize creditors to participate in an orderly restructuring deal. At the heart of this process is the ability to coordinate creditors in a way that provides adequate debt relief for the sovereign, without damaging its ability to engage in international markets in the future.

Chapter 9 seeks to distill the lessons from the previous chapters, and apply them to the issues faced by creditors and debtors today. In addition to the rapid increase in debt seen over the last ten years, many countries have also seen a significant shift in their creditor base towards a structure that might make debt crises harder to resolve in future. And in advanced countries especially, low growth partly driven by demographic factors will act as a significant headwind to reducing debt in coming years. Potential policy solutions are divided into those that help preserve ample policy space for responding to recessions, financial crises, and other sudden expenditure needs, and to policies to help a country navigate debt difficulties should it face them. To help make this book a useful reference for economic and legal scholars, we have also included a comprehensive data annex at the end of this book, which is also available online.³ This sets out the main sources of data on sovereign debt, including a description of the data and notes for researchers.

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³ See Abbas, S. Ali and Kenneth Rogoff, “A Guide to Sovereign Debt Data”, IMF Working Paper, 2019.

Public Debt through the Ages

*Barry Eichengreen, Asmaa El-Ganainy,
Rui Pedro Esteves, and Kris James Mitchener*

1. Introduction

Sovereign debt is a Janus-faced asset class.¹ In the best of times it relaxes the domestic constraint on savings, smooths consumption, and finances investment. Investors see it as a safe haven, as delivering “alpha,” and as a means of portfolio diversification. In the worst of times it is associated with debt overhangs, banking collapses, exchange-rate crises, and inflationary explosions. Investors see it unenforceable, illiquid, and prone to messy debt workouts.

In this chapter, we use history to analyze both aspects. Historical evidence provides insight into the seasons of darkness by increasing sample size. This helps because defaults on sovereign debt are not as frequent as on, say, corporate bonds. History also can enrich our understanding of those features of sovereign debt that are associated with crisis resolution, since there are variations over time in the structure of debt contracts, their enforceability, and the costs of default.

But a long-run perspective is equally useful for understanding the seasons of light. History illustrates how governments have used sovereign debt to shape economic and political development. It shows how they have used it to help build lasting states, provide public goods and complete infrastructure projects. Historical experience sheds light on how sovereign debt evolved into a safe asset, as governments have sought to render it more attractive to investors and, in the course of so doing, underpin the financial system.

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¹ In what follows, we focus on the debt of national (central, federal) governments and not those of state governments, local governments and parastatals except where the latter have been explicitly assumed by the national government.

History does not always unfold at the same pace, and the same is true of this chapter. In its first half (Sections 2–4) we review two millennia of debt history in an effort to recover the origins of sovereign borrowing. In the second half (Sections 5–7), we focus on the most recent century of sovereign debt history, with its more direct implications for contemporary policy-makers. Finally, Section 8 concludes.

2. Public Debt as State Building

Though it is challenging to pinpoint precisely when sovereign borrowing began, two criteria can help us identify when political entities first began making concerted use of marketable debt instruments. The first is the existence of the institutions necessary to issue public debt: durable towns, cities, states, and nations with well-defined borders; contract laws recognizing polities as entities capable of borrowing; and ledgers for payment and repayment (i.e., accounting systems).² A second criterion is market constraints: the immediate demand for credit by the polity must exceed tax revenues; and a sufficiently large number of individuals other than the sovereign must have wealth sufficient to lend substantial sums.

Although the written record points to instances of public borrowing as long as two thousand years ago, borrowing agreements with states were first concluded with regularity in the period 1000–1400 AD. Loans, such as those provided by Italian bankers to Edward III during the Hundred Years' War (1337–1443), were short term and bore high interest rates. Only after 1500 were territorial states able to borrow long term. Small city-states, in contrast, appear to have been able to borrow at longer maturities already the in thirteenth and fourteenth centuries. Epstein (2000) and Stasavage (2011) argue that city-states were able to borrow long term because they were compact, merchant-dominated polities with representative institutions capable of monitoring the sovereign.

An initial spurt of lending came from the papal finances in the 1260s. Although nominally rich, the Roman Church was hampered by the geographic dispersion of its property and other income sources, such as Peter's pence.³ Engaged in a long conflict with the Holy Roman emperor, the

² Removing the polity from the borrowing equation and replacing it with a single sovereign ruler simplifies the institutional requirements, since the contract can be written between an individual and the sovereign's creditors.

³ This was the annual tax of one penny from every English householder having land of a certain value paid to the Papal See from Anglo-Saxon times until it was discontinued in 1534 following King Henry VIII's break with Rome.

Church needed a way of paying the troops of its Italian allies. The solution of its Tuscan bankers was to anticipate income from Church property and religious dues. The Church encouraged banking firms to incorporate as joint stock companies as a way of stabilizing this early form of financial intermediation. These new banking firms had legal personalities that were independent of their investors. They had transferable shares. This new corporate form enabled them to increase their capital base and expand their lending capacity by selling shares and attracting deposits from wealthy individuals (Padgett 2012). They used the resulting income to grant advances to the Church.

This papal model was then emulated by the city-states of the Italian Peninsula.⁴ Debt contracts took the form of annuities called “rentes” and “renten.” These specified that lenders would receive a stream of interest payments over their lifetimes or in perpetuity, with the principal never repaid. Perpetuities were liquid because the stream of payments was not tied to the original lender.⁵ They formed the embryo of a permanent stock of public debt, since perpetual annuities could only be redeemed if the city raised sufficient revenue to repay the principal, which was the exception to the rule. (Life annuities, as noted, expired instead with the death of the original purchaser.) A further advantage of perpetual annuities was that they allowed lenders to circumvent religious doctrine on usury; since perpetuities never had to be repaid, theologians regarded them as legitimate contracts under which one party purchased a stream of future income from the other.⁶

The marketability of perpetual annuities created the conditions for the emergence of secondary markets, first locally, then nationally and finally internationally.⁷ Negotiability transformed these securities into what was in effect a public financial good. Investors regarded these government debt instruments as safe, liquid, and therefore eligible as collateral in over-the-counter markets. Although it is uncertain when sovereign debt was first used as collateral, by the end of the early modern period (the sixteenth through eighteenth centuries) it had become the dominant form of collateral for short-term credit in Europe.⁸ By expanding the collateral space, government annuities contributed to the

⁴ Albeit from the unpromising start of “forced loans” raised to deal with military emergencies. Munro (2013) describes how this innovation spread to other European polities.

⁵ Owing to this liquidity, they bore lower yields than lifetime annuities.

⁶ The final theological settlement of the issue was arrived at in the fifteenth century. It added additional conditions for the legitimacy of perpetual annuities; however, it turned out these were easier to circumvent than the initial prohibition against interest from *mutuum* (Munro 2013).

⁷ Sovereign debt was initially marketed to foreigners by the County of Holland in the sixteenth century (Neal 2015).

⁸ De Luca (2008) documents how city bonds were preferred as pledges in collateralized loans (*censi consegnativi*) in Milan in the late sixteenth century.

development of financial markets, to the expansion of trade, and to the acceleration of growth.

Most immediately, the acceptability of long-term government debt as collateral reduced required returns. Lenders had reason to believe, were they to have to liquidate such collateral, that they could do so at an attractive price. Politically independent city-states with control of their tax bases were thus able to issue long-term tradable debt at around 5 percent (Pezzolo 2014), noticeably below prior rates. The liquidity and acceptability of these government bonds in turn put downward pressure on the rates on short-term loans to the private sector secured by that collateral.

The supply of loans from city-states and territorial monarchies was driven by the need to finance military campaigns and secure borders. While direct and indirect taxes on trade and consumption might suffice for maintaining borders in peacetime, foreign military campaigns or the need to repel incursions by foreign troops could overwhelm existing revenue streams. The decline of feudal obligations for military service led sovereigns to create armies for hire, such as the *condottieri* of Venice, Florence, and Genoa. With more than 500 European polities vying for power, war was frequent (Tilly 1992). Sovereign debt thus developed as a vital means of state survival (Stasavage 2011). It enabled the state to finance expenditures of uncertain size and duration. Thus, as states evolved and developed, often in response to war, fiscal capacity did as well (Tilly 1992; Yun-Casalilla and O'Brien 2015).

From the sixteenth century, Europe's political geography coalesced into the nation states recognized at the Peace of Westphalia in 1648. In parallel, many European states evolved from absolutist regimes to more limited government. Dincecco (2009, 2010, 2011) argues that increased centralization was conducive to the growth of incomes and increased state revenue.⁹ He posits that centralized states, in contrast to absolutist and fragmented regimes, imposed limits on rulers. These states were therefore more responsible fiscally and able to offer lower sovereign yields. This shift in state structure coincided with the growing use of sovereign debt to fill fiscal gaps and with the emergence of secondary markets.¹⁰

⁹ This view is consistent with Alesina and Spolaore (2003), who argue that extreme fragmentation and decentralization on the one hand and excessive consolidation and centralization of state power on the other are both likely to be inefficient. Europe in this period can be seen as moving away from extreme fragmentation but not (yet) to excessive centralization (although problems of fractionalization remained, as we recount below when describing the Dutch experience).

¹⁰ These observations are consistent with empirical and theoretical work suggesting the existence of a positive relationship between financial development and a state's ability to tax (Besley and Persson 2009).

From the mid-sixteenth century, European states accumulated sovereign debts that look positively modern in terms of their shares of GDP, between 20 and 60 percent of national income (Drelichman and Voth 2014). To be sure, this transition was not uniform. Nor did it obviate the need for costly and sometimes unsuccessful experiments. A well-studied case is that of the Spanish monarchy under Philip II. Engaged in very expensive European wars, Philip funded his military campaigns by borrowing short-term from international bankers, mostly Genoese. Drelichman and Voth (2014) argue that the bankers were able to align the Spanish king's incentives by forming cartels that prevented competition from interlopers, à la Bulow and Rogoff (1989). Alvaréz-Nogal and Chamley (2014, 2016) dispute that the repeated fiscal crises in Spain constituted defaults in the modern sense. They argue, instead, that they were driven by the resistance of the Spanish parliament (*Cortes*) to fund new borrowing by the king.¹¹

The subsequent development of these instruments occurred in states that were sufficiently credible to issue negotiable debt that was traded in impersonal markets, as opposed to among a small number of well-connected bankers. The Dutch provinces, in their long fight for independence from the Habsburg Monarchy, first scaled up this model, and then added an international twist, whereby the securities issued by the central government and cities were marketed beyond the frontiers of the state itself (Tracy 1985).

Notwithstanding its relative success, the Dutch model, as the Spanish case before it, was hampered by fiscal fractionalization, as individual cities and provinces fought to retain control of their tax bases and minimize their share of central government expenses. This tension arose at a time when the Dutch state was attempting to mobilize against the France of Louis XIV and then England (de Vries and van der Woude 1997). The English mobilized even more extensive financial resources once they overcame the limitations of

¹¹ In this interpretation, the key to Philip's ability to borrow was not the Genoese cartel but the expectation that short-term debt (*asientos*) would be converted into long-term *juros*, which were guaranteed by the revenues of cities represented in the *Cortes*. One of the most dramatic episodes in this repeated relation happened in 1575 when the king stopped paying on the *asientos* held by Genoese bankers. Despite that, he did not touch the service of long-term *juros*. The underlying problem in 1575 was that cities refused to assent to a tax increase to allow a new funding operation that would retire the stock of *asientos*. This disrupted not only the king's finances but also the commercial credit market. The king and the cities then played a game of chicken for two years until the burden of a commercial crisis forced the cities' hand. In other words, the finances of Philip II resembled the periodic government shutdowns in the United States because of the need for Congressional approvals to raise the debt ceiling rather than the repeated defaults of debt intolerant states.

Dutch finance by developing a broader tax base (the excise tax and a more efficient system of tax collection). Brewer (1989) shows that Britain was able to more than triple its tax take from the late Stuarts to the war of American independence, rendering it a formidable if not always triumphant military power.¹²

Reinforcing these developments was the decision to charter the Bank of England as banker to the government in 1694. Following a series of defeats at the hands of the French, William III's credit was exhausted. In exchange for a £1.2 million loan, he allowed the subscribers to incorporate as a joint stock company, the Bank of England, that received a banking license and the privilege of issue in London. This was effectively a debt-for-equity swap. In time, the relation between the Bank and the state moved away from the funding of long-term debt to becoming the government's bank and the public debt office, simultaneously managing the money supply and floating new debt (Roberds and Velde 2014; Neal 2015). Monetary and fiscal policies were comingled in this new institution in ways that enabled the English government to fund itself at the lowest rates in Europe, issuing 3 percent annuities, while building up the single largest debt stock (Neal 1990).

3. From War Finance to Public Goods

Fiscal states thus evolved in response to the efforts of rulers to secure borders, expand territory, and survive. After 1650, larger, more centralized states increasingly possessed the fiscal machinery to raise revenue in uniform ways and had a veto player, such as a parliament, to monitor and discipline public expenditure (Dincecco 2011, 2015).¹³ Consistent with models in which strong states spend more on public goods (Acemoglu 2005), sovereign borrowing progressively shifted toward the provision of public goods. Domestic public debt took the turn first, with the issuance of bonds to finance education and public works. As incomes rose, manufacturing developed and cities grew, demands arose for clean water, sewers, and still more extensive public education. By the nineteenth century, sovereign debt was being used to finance everything from water and sewer works to railroads, ports, and canals.

¹² This stood in contrast to the less elastic land taxes and more costly consumption taxes of Continental Europe. Then came William Pitt's introduction of income tax at the end of the eighteenth century.

¹³ The seminal paper on parliament's ability to monitor the spending of the monarch is North and Weingast (1989) who argue that the English monarch credibly pledged to pursue a sustainable fiscal policy after the Glorious Revolution. This paper spawned a voluminous literature; see Dincecco (2015) for references.

Table 1.1 Geographical distribution of debt flows and stocks, 1880–1914

	(Each column made up of percentages that sum to 100)					
	Debt flows			Debt stocks		
	Foreign	Foreign	Foreign	Foreign	Foreign	Total
	1880–89	1890–99	1900–13	1913–14	1913–14	1913–14
Europe	36.8	48.5	37.4	47.3	48.9	73
North America	7.9	10.6	9.3	2.4	2.3	4.3
Latin America	47.8	12.3	21.3	9.2	9.8	5.1
Africa			0.4	7.8	7.4	2.6
Asia	7.5	28.6	25.9	26.1	24.9	9.6
Oceania			5.7	7.1	6.7	5.3
Total (USD m)	957.6	1284.5	4398.6	12729.1	13453.1	40171.8
# sovereigns	26	26	28	28	45	45

Sources: Bent and Esteves (2016) and United Nations (1946). Values in percentage unless otherwise noted.

This shift toward public investment acquired additional momentum with the development of global capital markets; foreigners searching for yield beyond their borders found it in debt backed by infrastructure projects, first and foremost railways, but other investments as well. Foreign assets rose from 7 percent of world GDP in 1870 to 20 percent in the first decade of the twentieth century (Obstfeld and Taylor 2004). Table 1.1 summarizes investments in sovereign debt and their geographic distribution in the four decades preceding the First World War.

Intra-European debt flows accounted for the largest share of new issues, but other regions were prominent in certain periods. Latin America was responsible for almost half of all issues before the 1890 Baring Crisis, for example, after which the share of Asia rose, driven by borrowing by Japan and China.

The total stock of debt in 1914 was estimated to be in excess of US\$40 billion, \$13.5 billion of which was foreign debt. The distribution of debt does not change significantly as a result of this broader geographic coverage. But this presentation highlights the importance of domestic debt and the fact that Europe was the most heavily indebted continent.¹⁴

Not all sovereign borrowing funded productive investment. A considerable fraction financed consumption, including government consumption (Feis 1930;

¹⁴ This last observation is not surprising. European countries had greater fiscal capacity, while emerging nations depended more on foreign finance and were less able to borrow in local currencies at home.

Fishlow 1985; Mitchener and Weidenmier 2010), while other borrowing was for the traditional purpose of war finance. For example, Japan floated its first government bonds in London, at 9 percent in 1870 and 7 percent in 1870 and 1873, to support the new Meiji regime's modernization agenda.¹⁵ In 1899, Japan then issued bonds in London, New York, and Hamburg in preparation for the impending Russo-Japanese war. Qing China, battling Russia on its Northern border and hostile US and European powers along its coastline, borrowed for defense and to pay reparations. It floated an 8 percent sterling-denominated bond in 1875, a 6 percent issue in 1885, and a 4.5 percent issue in 1898 (this last at an issue price of only 90 percent of face value and secured by customs receipts). It issued domestic bonds in 1894 to finance the First Sino-Japanese War and in 1898 to help pay for the indemnity of the Treaty of Shimonoseki. Both issues predictably lapsed into default when the Qing stepped down in 1912 (Ho and Li 2010).

Even when notionally raising debt to fund public goods, not all emerging economies' governments were able to manage their growing debt stocks to avoid insolvency. Case Study 1.1 describes the experience of Egypt, where fiscal expansion led first to the loss of financial autonomy and ultimately even political sovereignty.

Between a third and half of all domestic investment in Australia, Canada, Argentina, and Brazil in the second half of the nineteenth century was financed by capital imports (Fishlow 1985). Edelstein (1982) estimates that, in 1913, Great Britain kept 32 percent of its net national wealth overseas and had allocated 4 percent of its GDP to capital formation abroad every year on average for more than 40 years. Other international financial centers included Paris, Hamburg, Berlin, Brussels, Amsterdam, and Zurich. Together with England, France, Germany, Belgium, the Netherlands, and Switzerland accounted for 87 percent of overseas lending in the 1870–1913 period (Maddison 1995).

At the beginning of the nineteenth century, wealthy households held the majority of sovereign bonds. But with the progress of financial development, banks substantially increased their share (Ferguson 2006). This provided diversification for individual investors, who as small depositors invested indirectly in the market through financial intermediaries, as well as for the banks themselves, while enhancing the safe-asset function of sovereign debt.

¹⁵ Whereas the first issue financed railway construction, the second was used to pay off the accumulated debts of the earlier feudal regime. The interest rates it was charged were even higher than those paid on marginal credits such as those of Egypt and Romania, reflecting ongoing civil conflict prior to the Meiji's final consolidation of power and the difficulties of building a functioning tax system.

Case Study 1.1 Egypt's Debt history in the nineteenth century

The history of public debt in Egypt highlights several nineteenth-century themes: excessive borrowing by local administrations, great power rivalry, loss of financial sovereignty, and, ultimately, loss of political independence. Although formally a province of the Ottoman Empire, Egypt acquired substantial autonomy thanks to the efforts of Muhammed Ali, who ruled from 1805. In 1841 a settlement was reached whereby the Porte granted Ali and his successors the title of governor of Egypt (known as Khedive) in exchange for an annual tribute. While this settlement did not grant the privilege of issuing state loans, neither did it exclude it.¹ Taking advantage of the ambiguity, the Khedive Said (1854–63) issued short-term loans and obtained a personal loan from the *Comptoir d'Escompte* in Paris to fund the construction of the Suez Canal.

The era of modern state finance started in 1862 with the flotation of a £2.2 million external loan in London, helped along by the temporarily strong cotton prices produced by the American Civil War. When Khedive Ismail assumed power in 1863, he thus inherited a sizable debt. But rather than consolidating, he borrowed to finance everything from a national road system to an opera house (Landes 1958). By 1876 the funded debt had risen to £69 million, the floating debt to £26 million. Since the tax base did not rise commensurately, new loans had to be raised just to fund interest and amortization payments.²

Declining cotton prices, the 1873 financial crisis, and the 1875 Ottoman default then closed the markets to Egyptian loans. In an effort to normalize relations, Ismail turned over customs duties, tobacco-monopoly revenues, and provincial taxes to representatives of its foreign creditors, organized as the *Caisse de la Dette Publique*. This was the first application of foreign financial control of the finances of impecunious debtors, a model copied for the Ottoman Empire in 1882, Serbia in 1895, and Greece in 1898 (Mitchener and Weidenmier 2010). The *Caisse* received the assigned revenues directly from the source and possessed veto power over new

¹ The Ottomans themselves only issued their first foreign loan in 1854. However, since all Egyptian taxes were levied under the Ottoman Sultan's authority, the future Egyptian loans would be issued with the Sultan's permission.

² The Khedive resorted to increasingly desperate measures, pledging the revenues of his extensive personal estates (*Dairas*), pre-collecting taxes (in exchange for a 50 percent discount) and selling 45 percent of Suez Canal shares to the British government.

Continued

Case Study 1.1 *Continued*

borrowing or changes to taxation.³ In exchange, it consolidated most of the external debt into a new 7 percent loan.⁴

After uprisings against foreign control and murders of Europeans, Britain bombarded Alexandria and occupied Egypt in 1882, taking charge of government finances (Feis 1930).⁵ The stated policy of the British government had been never to intervene in foreign countries on behalf of the commercial interests of its subjects. But as Platt (1968) and Lipson (1985) observe, exceptions were made for strategic reasons.⁶ In the case of Egypt, commercial, political, and financial interests came together.

Among the priorities of the British administration was restoring the solvency of the Egyptian state, which was achieved with the issue of a new loan in 1885 under the guarantee of Britain and five other European governments (Esteves and Tunçer 2016). Under British rule, public revenues increased by 50 percent between 1882 and 1904. Because the *Caisse* had accumulated large reserves, the French creditors agreed to reduce their control over public revenues. The government used the resulting flexibility to return to the market and convert old debt into new loans paying half the previous rate.

Between 1882 and 1913, outstanding foreign debt fell from ten times government revenues to half that value. Roads, railroads, and canals, including the Aswan Dam, were constructed using funds from tax revenues, and new loans were placed on international capital markets. Yet, despite this progress, public revenues in Egypt grew the least among its peers under international financial control (Turkey, Serbia, Greece). This was partly because the *Caisse*, earning ample revenues under the status quo, did little to encourage fiscal reforms, such as re-directing revenues from land tax to indirect taxation and customs revenues, which were cheaper to administer and easier to increase (Tunçer 2015). On the eve of the First World War, Egypt thus had one of the weakest fiscal capacities among its peers.

³ The British and French governments forced dual control over the remaining Egyptian finances by securing the right to appoint two controllers-general (one for revenues and the other for audit and debt) with powers to collect and administer the revenues and expenditures of the Egyptian state.

⁴ The new debt service remained unsustainable, however, until a reduction, three years later, of the coupon to 4 percent.

⁵ This is despite the fact that the French in fact held two-thirds of the debt.

⁶ This position is often referred to as the “Palmerston doctrine” after the erstwhile British foreign secretary, who made it clear in 1848 that “it was entirely a matter of discretion, and by no means a question of international right” whether the British government would support the interests of British bondholders abroad (cit. in Tunçer 2015: 17).

By 1883, foreign and colonial government bonds accounted for 23 percent of all securities quoted on the London Stock Exchange (Michie 1999). They still accounted for 21 percent in 1913, far outstripping the share of domestic public debt (Tomz and Wright 2013).

Starting with Amsterdam, but followed by London, Paris, and Berlin, the microstructure of the securities market adapted to accommodate foreign bonds (Michie 2006). Large investment houses dominated underwriting and issuance, while specialized market makers provided secondary market liquidity (Michie 1999). Flandreau et al. (2010) suggest that underwriters played a role in regulating sovereign debt issuance by signaling to markets which countries had lower ex-ante default risk. Sovereign spreads were ex-post negatively correlated with underwriter reputation through the end of the nineteenth century, as more reputable underwriters issued new debt placements of high-quality sovereigns. This signaling function had become less relevant by the end of the nineteenth century, as the access of investors to information on sovereigns improved. Specialists started issuing financial handbooks with information on foreign governments while the financial press provided coverage of the market. Bondholder organizations also acquired the double function of monitoring borrowers and coordinating restructuring negotiations.

Financial integration was reinforced by monetary convergence, as countries and colonies abandoned paper and bimetallic systems for the gold standard. Early empirical work suggested that gold-standard adoption, by eliminating monetary discretion, lowered borrowing costs (Bordo and Rockoff 1996). Subsequent recent research has shown that membership in the gold club did not eliminate currency risk (Mitchener and Weidenmier 2015), although it helped governments to relieve the “original sin” of only being able to sell their debt abroad when denominated in gold (Flandreau and Sussman 2005). A consequence of this growing tendency of states in other regions to tap European capital markets was an increasing co-movement of business and financial cycles (Bordo and Haubrich 2010). This manifested itself in the high correlation of sovereign spreads across countries, although that correlation was still lower than today (Mauro et al. 2002). It is uncertain whether this correlation heightened the risk of contagious crises (Neal and Weidenmier 2003; Mitchener and Weidenmier 2008). But that debt crises occurred in waves (Reinhart and Rogoff 2009; Reinhart et al. 2016) is at least suggestive of the existence of contagion.

In the nineteenth century, defaults on external debts were common. Figure 1.1 plots the incidence of new defaults and the percentage of

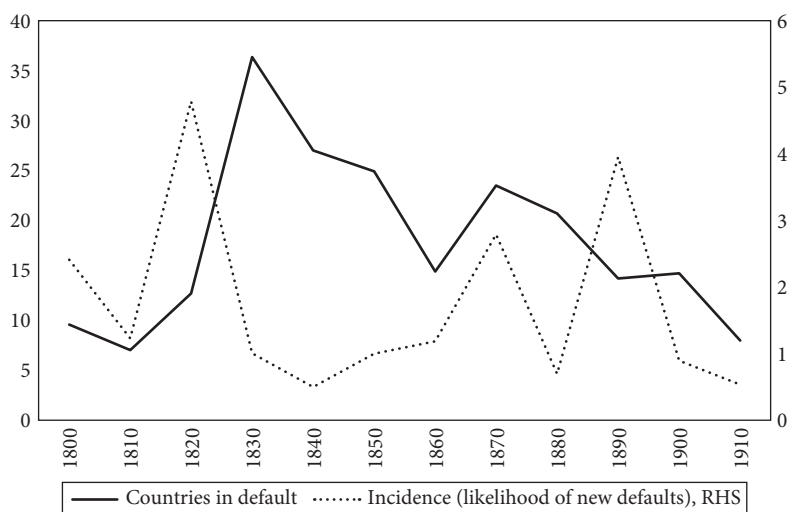


Figure 1.1 Sovereign default prevalence, 1800–1913

independent nations under default by decade.¹⁶ The peaks of the two series are associated with some of the largest international financial crises of the period. The first Latin American debt crisis, starting in 1826, touched almost all the continent and came on the heels of large capital inflows from Europe. The unconditional probability of default rose above 5 percent per annum, and by the end of the decade close to a third of all independent nations had defaulted on their external debts. Renegotiation was slow, and only in the 1860s did the fraction of countries in default fall below a quarter.¹⁷ Normalization was short-lived, however, as the new capital bonanza collapsed with the 1873 crisis. The likelihood of new defaults rose to 2.5 percent per annum, and emerging economies were affected disproportionately.

The next spike followed the Baring crisis in 1890. Although the default rate rose above 4 percent per annum, its highest level since the 1820s, the number of defaulting nations rose more modestly and then fell continuously until 1913. Defaults were resolved faster than in the early part of the century: according to Suter (1990), the average duration of defaults fell from 14 years prior to 1870, to 8 years in the 1870s and 1880s and 2 years thereafter, with

¹⁶ The number of sovereign nations increased over the century until a maximum of 47 on the eve of the First World War. We adjust our calculations for the number of countries effectively independent in each year.

¹⁷ Reinhart and Rogoff (2011) emphasize that sovereigns also frequently defaulted on their domestic debt obligations. These defaults, however, are not very significant in the group of countries represented in Figure 1.1.

help from bondholders' committees and, in some cases, direct intervention by the governments of creditor countries (Mitchener and Weidenmier 2008).

The historical literature points to macroeconomic imbalances, political instability, and war as among the principal causes of default (Feis 1930; Fishlow 1985; Reinhart and Rogoff 2009; Tomz and Wright 2013). Notwithstanding improvements in the industrial organization of the sovereign debt market, collective-action problems limited the ability of creditors to deter future defaults on sovereign bonds. Reputable underwriters sometimes acted to screen out dubious credits and discourage excessive borrowing, but in an increasingly contestable market they might see their position undermined by new competitors with less reputation at risk (Flores 2011). Strict adherence to the doctrine of sovereign immunity prevented the bondholders from pursuing legal redress. Reputation alone was often insufficient for deterring default when circumstances were unpropitious (Flandreau and Zumer 2004). The conclusion of Lindert and Morton (1989) that “‘investors seem to pay little attention to the past repayment record of the borrower’” may be exaggerated, but it points to the fact that sovereigns were often able to take steps to placate the creditors—negotiating a settlement, undertaking a bond exchange, and going onto the gold standard—and regain market access relatively quickly.

For some countries, default became a recurrent hazard. This is evident if we calculate the probability of default conditional on the number of previous defaults. For the countries covered in Figure 1.1, the conditional probability of default was relatively low at about 1.5 percent per annum for countries with up to one default prior, but rose to 2.2 percent after two defaults and 4.7 percent after three.

4. Debt Consolidation before 1913

In this section, we describe three notable debt consolidation episodes before the First World War: Great Britain after the Napoleonic Wars, the United States in the last third of the nineteenth century, and France in the decades leading up to 1913. While the colorful debt crises and defaults of the first era of globalization have been much discussed, less attention has been paid to these successful consolidation episodes. We focus on these three cases because they involved three of the largest economies of the period, but also because their debt burdens were among the heaviest. British public debt as a share of GDP was higher in the aftermath of the Napoleonic Wars, for example, than Greek public debt in 2018. But in all three cases, high public debts were

successfully reduced relative to GDP. They were reduced in different ways, however, than is typical of twentieth- and twenty-first-century economies. In particular, there was no restructuring or renegotiation of official or privately-held debts in these cases. Nor was there financial repression, that is, measures artificially depressing interest rates.

Our analysis follows Abbas et al. (2011, 2014a) in decomposing debt changes according to the following debt accumulation equation:

$$d_T - d_0 = \sum_{t=1}^T p_t + \sum_{t=1}^T \frac{i_t - \gamma_t}{1 + \gamma_t} d_{t-1} + \sum_{t=1}^T sfa_t \quad (1)$$

Equation (1) states that, the total change in the debt-to-GDP ratio ($d_T - d_0$) over an episode is the sum of three components, each cumulated over the length of the episode: (i) the primary budget balance (p_t)—sometimes referred to as the fiscal effort; (ii) the product of the lagged debt ratio and the differential between the effective interest rate on debt (i_t) and the nominal GDP growth rate (γ_t)—a term that captures endogenous debt dynamics but can also be thought of as capturing financial repression insofar as the real interest rate is successfully kept below the real rate of economic growth; and (iii) a residual stock-flow adjustment term (sfa_t).¹⁸ Case Study 1.2 details the nature of the operations captured in this residual term.

The Napoleonic Wars, Franco-Prussian War, and US Civil War were the three most expensive conflicts of the nineteenth century. Governments and banks were forced to suspend the convertibility of currency into gold (and, in the French case, into silver) while resorting to money creation; but in all three episodes, seigniorage accounted for a relatively small fraction of war finance. The majority of war expenditure was financed by taxation and public debt issuance. Consistent with theories of optimal tax smoothing (Barro 1987), debt accounted for the single largest share of wartime financing. Relative to the prewar status quo, taxes were higher during and after the war, but they were raised by just enough to service and pay down the debt.

Britain financed the Napoleonic Wars primarily by borrowing and, in their latter stages, by raising taxes. Once gold convertibility was suspended in 1797, it relied on the Bank of England as a purchaser of government securities. But the increase in the Bank's holdings was limited; these rose from £10 million in 1797 to £15 million in 1809. Debt securities were placed mainly with

¹⁸ Note that the decomposition methodology understates the true contribution of economic growth to debt reduction to the extent that high growth eases the political constraints on improving the primary fiscal balance (Mauro and Zilinsky 2016).

Case Study 1.2 Definition and interpretation of the stock-flow adjustment

The SFA captures statistical discrepancies between the actual change in the debt ratio and the sum of the other two components on the right-hand side of equation 1 (the primary budget balance and the growth-interest differential). Such discrepancies can reflect several factors: valuation effects on foreign currency debt, timing effects (deficits are measured in accrual terms while debt is a cash concept), below-the-line operations such as assumption of debts of non-governmental entities, debt restructuring or default, privatization, and bank recapitalization costs. The SFA will also be affected by other forms to support the financial sector that increase the debt but not the deficit, drawdown and buildup of government deposits, transactions in financial assets, and measurement and statistical errors.

According to current conventions, financial sector support measures can affect both deficit and debt. Unless they are financed from cash reserves, they will increase gross debt. Whether they also affect the budget balance depends on whether the operation presents a clear loss for the government. If so, they would be classified as a capital transfer—for example acquisition of financial assets above market price and capital injections to cover bank losses. However, if the government receives shares in a bank or debt securities of equal value to the capital injection it provides, the support measure is classified as a financial operation that only affects the government gross debt. Reclassification of entities from the financial sector to the general government sector (e.g., the nationalization of banks) also increases government debt but not the deficit. (For details, see European Central Bank 2015; Maurer and Grussenmeyer 2015.)

Interpretation of the SFA depends on its sign and on whether the decomposition exercise is undertaken for debt accumulation or debt reduction episodes. In a debt accumulation episode, a positive (negative) SFA increases (reduces) debt. In a debt consolidation episode, a negative SFA means that the debt fell by less (was consolidated by less) than the growth-interest differential and primary surplus would lead one to expect. Put differently, had the SFA been positive in a consolidation episode (implying that it contributed “positively” to the reduction), the decline in debt would have been larger than what was observed, assuming that the contributions of the primary balance and the growth-interest differential

Continued

Case Study 1.2 *Continued*

are the same. While large SFAs tend to be common during debt surges, they also occur in consolidation episodes (Abbas et al. 2011; Weber 2012). They reflect a host of country-specific factors: domestic institutions (budget transparency), politics (elections), and economic cycles (recessions). The scale of such discrepancies depends on the extent of fiscal transparency in the budget process, among other factors (Alt et al. 2014).

private investors; the government signaled its commitment to maintaining the real value of its obligations by continuing to amortize debt (maintaining the Sinking Fund established in 1786) and by indicating its intention of restoring gold convertibility at the prewar rate.¹⁹ In 1799 William Pitt the Younger introduced the country's first income tax. This contributed fully 20 percent of total tax revenues by 1815. The price level, having risen by 90 percent between 1791 and 1813, was then pushed down to within 10 percent of prewar levels in 1821, when convertibility was restored.²⁰

Union government financing of the American Civil War was not dissimilar. The majority of wartime spending was financed by issuing bonds and raising taxes. Taxes accounted for only a small fraction of resources in 1861–2, but their share rose starting in 1863 with increases in tariffs and excises and the introduction of the first income tax in American history (Pollack 2014). By 1865 a quarter of federal revenues were accounted for by taxes, a slightly higher share than in early nineteenth-century Britain. Bonds held by the banks and low-denomination notes in the hands of the public rose from \$65 million to more than \$2 billion between 1861 and 1865. The most controversial element was the issuance by the Treasury of greenbacks, currency notes not backed by gold, which accounted for 15 percent of wartime government spending. Associated with their emission was a rise in the price level by about 75 percent, slightly less than in Britain during the Napoleonic period. In the United States, it took until 1878 for prices to be pushed back down to prewar levels and until 1879 for gold convertibility to be restored, a somewhat more extended readjustment than in Britain.²¹

¹⁹ Bordo and White (1991) cite the government's failure to refute criticism of the Bank of England by the authors of the 1810 Bullion Report as a clear indication of its intention to restore convertibility at the prewar rate.

²⁰ "Price level" refers to the Gayer, Rostow, and Schwartz index of the prices of domestic and imported commodities.

²¹ Prices here are the Warren and Pearson index for all commodities.

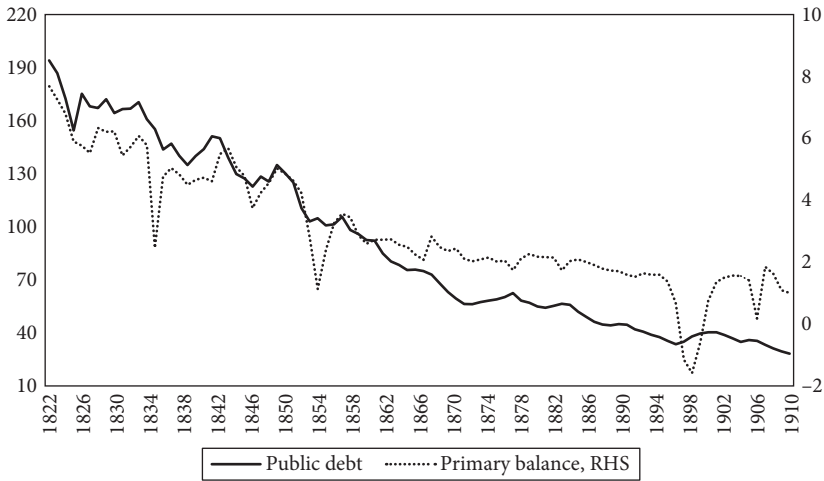


Figure 1.2 Public debt and primary balance in the United Kingdom (in % of GDP)

French government expenses in 1870–1 were financed half out of taxes (Hozier 1872). That the war was short limited the need to resort to debt finance. The Bank of France provided direct advances to the government, collateralized by Treasury securities, and in 1871 to the Paris Commune, the Bank's Paris-based directors evidently fearing for their safety. The indemnity transferred to Germany was then financed by two large postwar bond issues, rendering the French government's debt the largest in the world. Still, the yield was just 6 percent, despite the fact that France was defeated and still occupied, testifying to confidence on the part of investors that the authorities would move to stabilize prices, restore convertibility, and honor their obligations.

Table 1.2 illustrates how these high debts were reduced. The starting point in each case is the peak debt-to-GDP ratio. The reduction in the British debt-to-GDP ratio was by far the largest and longest: the debt ratio fell from 194 percent in 1822 to 28 percent nine decades later (see Figure 1.2).²² The French public-debt-to-GDP ratio fell from 96 percent in 1896 to 51 percent in 1913, after which consolidation was terminated by the outbreak of war. This case ranks second in size but first in pace. US (federal or union) government debt

²² This is a good place to acknowledge the uncertainty surrounding historical estimates of GDP, which tend to be produced by estimating growth rates in earlier periods and back-casting modern levels of GDP. In the case of the UK, those early growth rates have been revised downward by recent scholars, resulting in upward revisions of the level of GDP in, say, 1822, when our series for the UK begins. We use the most recent estimates of UK GDP combining the values for Great Britain from Broadberry et al. (2015) with those of Andersson and Lennard (2018) for Ireland.

Table 1.2 Decomposition of select large pre-1914 debt reductions

Country	Period	Debt/GDP ratio		Decomposition (in %)					Average real GDP growth	Average effective real interest rate	Average inflation rate
		Starting	Ending	Primary balance	Growth–interest differential ($g-i$)	g	$-i$	Stock-flow adjustment			
UK	1822–1913	194.1	28.3	180.5	−95.6	88.4	−184	15.1	1.9	3.5	−0.1
USA	1867–1913	30.1	3.2	151.1	−46.3	48.2	−95	−4.8	4.2	4.3	−0.9
France	1896–1913	95.6	51.1	100.4	−1.9	96.3	−98	1.6	2.6	2.9	0.5

Sources: Authors' calculations; data sources: for the United States: Carter et al. (2006); for France: Flandreau and Zumer (2004); for the UK: the Bank of England's database A millennium of macroeconomic data: <https://www.bankofengland.co.uk/-/media/boe/files/statistics/research-datasets/a-millennium-of-macroeconomic-data-for-the-uk.xlsx>

was not as high at the end of the Civil War, and the subsequent consolidation was more leisurely; however, the process is notable for having reduced the debt-to-GDP ratio to virtually zero by the First World War.

In contrast to the post-Second World War debt reductions described in Section 8, the growth-rate–interest-rate differential did not contribute to the decline of debt burdens in these nineteenth-century episodes. The contribution of this differential was, in fact, negative in all three cases. It was least negative in France after 1896, since it operated over the shortest span and because prices, having trended gently downward for much of the nineteenth century, turned upward in the mid-1890s, reflecting gold discoveries in the Klondike and Western Australia that reduced real interest rates (Eichengreen 1982).

Relatively high coupon rates on debts placed during the wars combined with moderate growth rates and low inflation to produce the negative growth–interest-rate differential. Growth rates were modest during the First Industrial Revolution, since the productivity increase associated with mechanization was limited to a narrow set of sectors (Crafts and Harley 1992). In the French case, economic historians point to a low rate of population increase as a further factor in the slow aggregate rate of growth (Crouzet 2003). Only the United States, a country of immigration and a pioneer in the adoption of modern mass-production methods, displayed what modern observers would characterize as an impressive rate of economic growth. And even in this case, the real GDP growth rate did not exceed the real interest rate.

Governments for their part did little to bottle up savings at home or to otherwise use regulation and legislation to artificially depress yields. The British government did not discourage foreign investment. French foreign investment was less extensive, but it was actively encouraged by officials as an alliance-building-and-solidifying device (Feis 1930). In the United States, the National Banking Act of 1863 required federally-chartered banks to hold government bonds as backing for notes, but note issuance was profitable even subject to this proviso.

The negative contribution of the growth-rate–interest-rate differential was compensated for by large and persistent primary surpluses. Britain achieved the impressive feat of maintaining an average primary surplus of 1.6 percent of GDP for nearly a century (the only deficit in Figure 1.2 is at the time of the Boer War). One of the political legacies of Peel and Gladstone was a fiscal theory or philosophy of “sound finance” emphasizing budget surpluses, low taxes, and minimal government expenditure (Campbell 2004). This philosophy was integral to the Victorian economic strategy of free trade, peace, and retrenchment, in which trade promoted peace, which in turn permitted military

expenditures to be limited. At the same time, faithfully servicing the debt and progressively reducing its burden enhanced the prospects for borrowing in a future conflict and thereby helped to secure the nation.

In political terms, this outcome reflected the balance of interests in Parliament, where creditors remained generously represented even after the Reform Acts of 1832 and 1837. As MacDonald (2003) puts it, “The most obvious reason for the firmness of the British commitment to its public debt was the predominance of public creditors within the political system.” It was hard, as he observes, to find a member of Parliament who was not also a bondholder. Successive budgetary reforms starting in the 1820s gave Parliament control over expenditure and allowed it to apply the resulting surpluses to a reduction of the debt stock. A consequence of this political equilibrium was that demands for spending on welfare relief from the disenfranchised masses were kept in check. In exchange, the self-taxing class of income-tax-paying electors relieved the non-electors from the burden of direct taxation (Daunton 2001). Budget surpluses then made feasible further reductions in tariffs and taxes, which reduced the cost of living for the working class (Maloney 1998).²³

In the United States, primary surpluses were consistently achieved despite the presence of universal (white male) suffrage (Figure 1.3). That the economy was expanding strongly, due not just to the growth of per capita GDP but also the number of “capitas” in a country of large-scale immigration made managing the debt burden correspondingly easier (Bayoumi and Bordo 1998). Creditor interests were strongly represented in Congress, especially prior to the Progressive Era reaction against the “Money Trust.” The tariff, defended by the Republican Party, provided an elastic supply of government revenues in this period of expanding trade. On the spending side, Southern states opposed an expansive role for the federal government, while entitlements limited to Civil War pensions contained pressure for public spending.

In France, debt reduction was entirely accounted for by primary surpluses. Those surpluses exceeded British levels, reaching 2.5 percent of GDP on average, albeit over a shorter period.²⁴ Consolidation was delayed for two decades following the war and payment of the 5 billion franc indemnity to the German Empire (roughly a quarter of one year’s French GDP), as French

²³ Only with the electoral reforms of the 1880s were the urban and rural poor represented in Parliament. The political equilibrium reached its limits with these electoral reforms and the increasing organization of unskilled trade unions, whose members could not afford to pay for self-help welfare and the costs of rearmament starting in the 1890s.

²⁴ Analysis of modern data (by e.g., Eichengreen and Panizza 2016) suggests that this is just about the political limit of the primary surpluses that can be sustained over periods of this length.

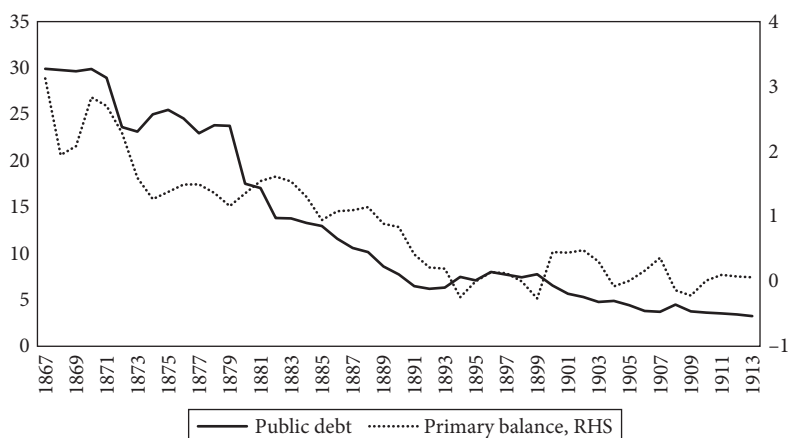


Figure 1.3 Public debt and primary balance in the United States (in % of GDP)

Sources: Carter et al. (2006) and authors' calculations.

governments first sought to rebuild the economy and then to counter German economic and military might, investing in roads, railways, and schools. From the turn of the century, tensions with Germany (and the first Moroccan crisis in 1905) then created pressure for military spending. But even this did not stand in the way of primary surpluses (see Figure 1.4), governing elites seeing debt reduction as putting the country in a stronger financial position in the event of a full-blown conflict with that country (Dyson 2014). French leaders attributed the country's serial defeats to international conflicts, from the Seven Years' War to the Franco-Prussian War, and to the weakness of French finances, compared to those of Britain and Germany. They now sought to take corrective action.

Another missing element is the SFA. None of these three governments undertook involuntary restructurings despite the inheritance of heavy debt. Only in Britain was the SFA responsible for a nonnegligible share of debt reduction. Its 15 percent share is due to the conversion of the stock of perpetual debt (Consols) from 3 to 2.5 percent bonds undertaken by the Chancellor of the Exchequer George Goschen in 1888. Interest rates having fallen, these bonds were trading above par. Goschen could threaten to repay the principal at par if they were not converted into new 2.5 percent bonds. The majority was so converted, and the remainder was paid off out of excess Treasury balances. The important point is that the consequent reduction in debt held by the public was voluntary.

Thus, in all three of these large-scale debt consolidations, governments and societies went to great lengths to service and repay heavy debts. This was

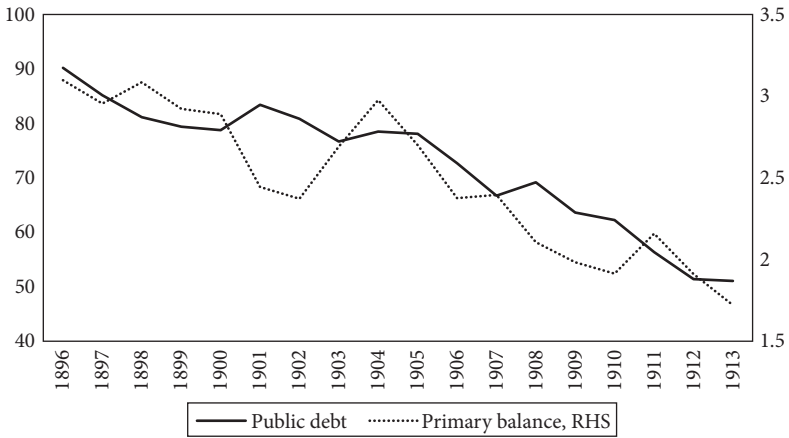


Figure 1.4 Public debt and primary balance in France (in % of GDP)

Sources: Flandreau and Zumer (2004) and authors' calculations.

partly a matter of the enfranchisement and political influence of the creditor class. In part, it reflected prevailing conceptions of the limited functions of government, and limited popular pressure for public programs, entitlements, and transfers. In part, it reflected the imperative of maintaining or restoring creditworthiness in order to ensure the capacity to mobilize resources and guarantee state survival. And, in part, it reflected good luck—the absence of major wars and crises during the consolidation period.

5. Evolution of Public Debt since 1900

We turn now to the evolution of public debt since the early twentieth century. We consider the G-20 economies together with a set of low-income countries. In classifying countries as advanced, emerging, or low income, we follow the IMF *World Economic Outlook* categorization.

We distinguish sovereign debt according to its currency composition, maturity, and holder profile. Debt structure matters for the level and volatility of debt servicing costs, and for the management of funding (refinancing) and exchange-rate risk. Long-term debt generally commands relatively high interest rates, but rollover risks are lower. Foreign-currency debt can help reduce borrowing costs but exposes the sovereign to exchange rate risks and can increase debt-service costs in the event of currency depreciation. Rising

foreign participation can reduce borrowing costs and spread risks more broadly but also raise external funding risks, to the extent that foreign holdings are “less sticky.” Finally, higher domestic bank ownership of own sovereign debt can help address funding needs at times of stress, although it can also, under adverse circumstance, create potentially harmful sovereign–bank linkages and threaten domestic financial stability.

Figure 1.5 is an overview of the evolution of public debt from 1900 to 2015. There are prominent episodes when wars, recessions, and crises produced sharp increases. In the advanced economies, these surges are linked to the two world wars, the Great Depression, the Great Accumulation (the mid-1970s through the mid-2000s), and the recession that followed the Global Financial Crisis. In emerging economies, spikes in the debt ratio occurred in the 1930s and in the 1970s through the 1990s. In the low-income countries, the major surge was in the 1980s and 1990s. Most of these debt-accumulation episodes were then followed by reversals or consolidations of some magnitude, although the Great Accumulation in the advanced economies is an exception, up to this point at least.

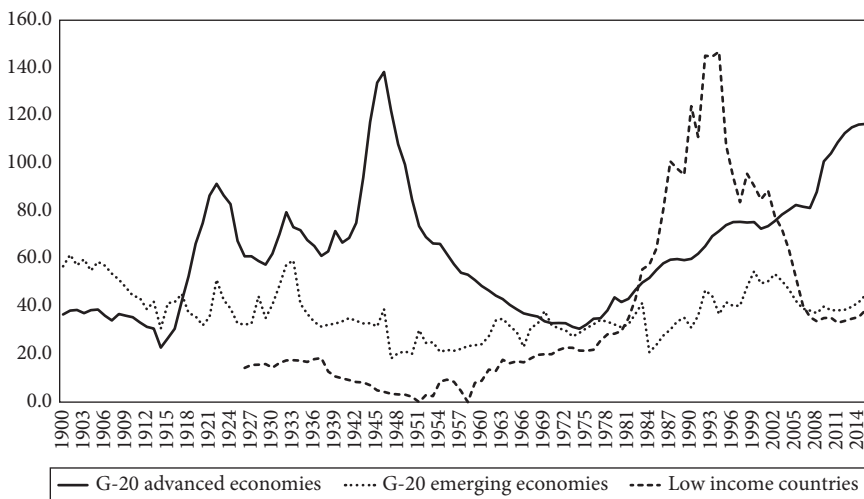


Figure 1.5 Public debt ratio(in % of GDP)

Sources: Abbas et al. (2014a), and latest update of the IMF’s Historical Public Debt Database (HPDD). For advanced economies, data up to 2009 are from Abbas et al. 2011, and from 2010 through 2015 are from the latest version of the HPDD. For all other countries data are from the latest version of the HPDD. For advanced and emerging economies, data start from 1900; for low-income countries, they start in 1926 with coverage expanding in the 1950s and again in 1970s. PPP-GDP weighted averages.

A. Advanced countries

Debt-to-GDP ratios in the advanced economies averaged 63 percent over the 115-year period.²⁵ They declined between 1900 and 1914, reflecting broadly balanced budgets (despite rising military spending) and economic growth (with interruptions, such as at the time of the 1907 financial crisis). By 1914 advanced-country debt had fallen to 23 percent of GDP, the 115-year low. The First World War, the Great Depression, and the Second World War then created new demands for public spending. Together they drove debt up to about 140 percent of GDP in 1946, the highest level in the eleven decades.

A period of consolidation extending into the 1970s then followed. Already by 1960, the halfway point of this interlude, advanced-country debt had fallen to about 50 percent of GDP on the back of strong growth and limited budget deficits, with help from inflation and low interest rates. The subsequent rise from the mid-1970s through the 1980s coincided with slower productivity growth, expanding welfare states, and higher interest rates.²⁶ This gradual, sustained rise in debt ratios persisted through the Global Financial Crisis, which gave the trend a further fillip.

Domestic-currency-denominated medium-to-long-term (MLT) debt comprised, on average, close to three-quarters of total advanced-country debt (Figure 1.6). Evidently, an inability to issue long-dated debt instruments in a local currency was not an issue in advanced economies to the same extent as in emerging economies.

There were exceptions, however. In less favorable times such as wars, crises, and recessions, advanced-country governments compensated for the greater perceived riskiness of their debts by shortening maturities. The MLT share fell during the First World War, when the authorities sought to meet extraordinary military spending needs using short-term debt. It fell again in the Great Depression and during the Second World War. The shortening of maturities continued after the war, as inflation eroded investor appetite for long-dated securities. In the United States, for example, this share fell steadily from the 1960s through the late-1970s, coincident with accelerating inflation, although it then recovered sharply starting around the time of the Volcker disinflation. The MLT share then started rising again in the 1980s,

²⁵ Averages are PPP GDP-weighted except where noted otherwise.

²⁶ Yared (2018) attributes the *trend* in debt accumulation over the past 40 years in the advanced economies to population aging and the associated rise in popular demands for pensions, health care, and other (often unfunded) social services.

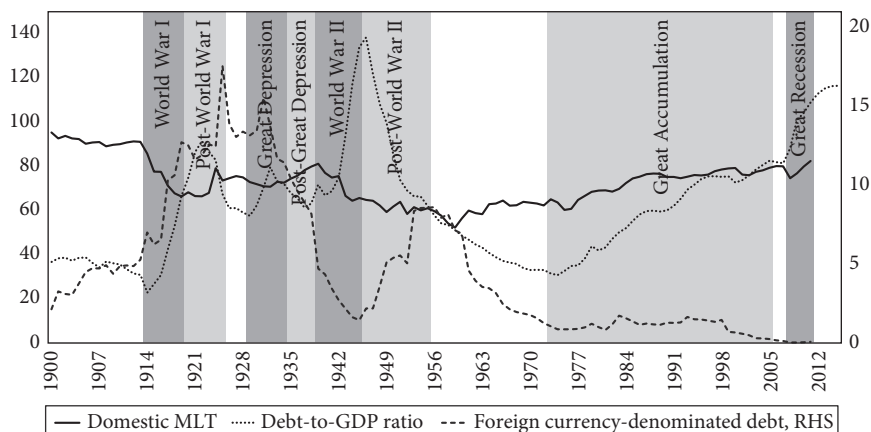


Figure 1.6 Debt composition in advanced economies, maturity and currency (shares in % of total public debt, debt ratio in %)

Notes: G20 advanced economies included are Australia, Canada, France, Germany, Italy, Japan, the UK and the USA. PPP-GDP weighted averages.

Source: Abbas et al. (2014b).

in the United States and more generally, coincident with inflation stabilization and financial development, and specifically with the growth of investor groups, such as pension funds, mutual funds, and insurance companies, with long-term liabilities and hence strong demand for long-term assets. Finally, there were sharp fluctuations around the time of the Great Recession: the MLT share first fell sharply, reflecting heightened uncertainty, but recovered already in 2009–10, as central banks ramped up their purchases of long-term debt.

Although the share of foreign-currency-denominated debt of G-20 advanced economies was low on average (roughly 5 percent of the total), several countries saw it rise sharply at some point in the eleven decades considered here. In Japan and Italy, shares of foreign-currency-denominated debt averaged close to 50 percent in 1915–18 and 1919–26, respectively. As noted above, Japan borrowed abroad, in sterling, marks, and dollars, to finance war with Russia, while Italy tapped foreign markets once the political turbulence of the early 1920s had passed (Meyer 1970). This rise in the foreign-currency share of advanced-economy debt following the First World War was general, reflecting the extension of dollar-denominated loans by the United States to its European allies to finance relief and reconstruction. The subsequent decline in this share during the Great Depression reflected the relief received

by the advanced economies on their war-related debts from the United States and the UK in 1934 (Reinhart and Trebesch 2014).²⁷

A final spike in the share of foreign-currency-denominated debt is visible in the immediate post-Second World War period. This reflects the rise in the share of foreign-currency debt in Germany in 1953–56, when the Federal Republic negotiated the 1953 London Agreement under which it assumed a share of the predecessor government’s debts.²⁸ From there, the share of advanced-economy debt denominated in foreign currency declined steadily toward its near negligible levels today.²⁹

The shares of advanced-economy sovereign debt held by central and commercial banks rose in periods of stress, when individual investors drew back and governments, to take up the slack, leaned on central and commercial banks. This tendency is evident during the two world wars, the Great Depression, and the productivity slowdown of the 1970s (Figure 1.7).

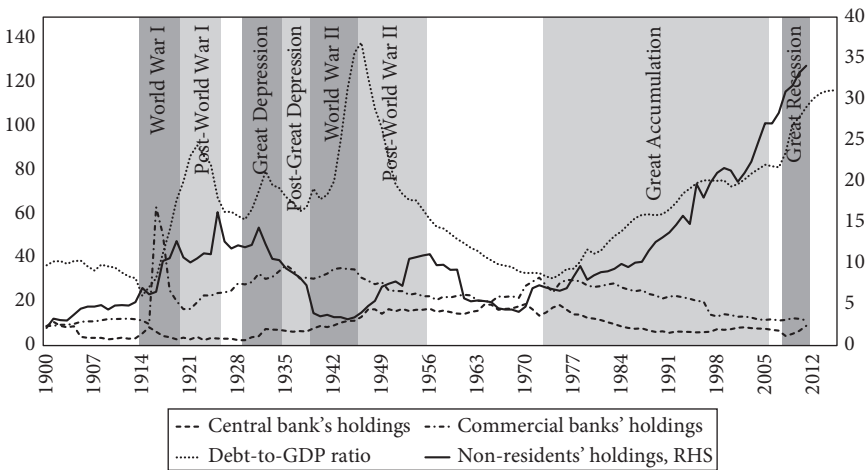


Figure 1.7 Debt composition in advanced economies, holders (shares in % of total public debt, debt ratio in %)

Notes: G20 advanced economies included are Australia, Canada, France, Germany, Italy, Japan, the UK and the USA. PPP-GDP weighted averages.

Source: Abbas et al. (2014b).

²⁷ War debts were the dominant type of indebtedness for many advanced countries in the 1920s. That decade saw some preliminary rescheduling agreements that postponed the repayment of war-related debts but without a reduction in the notional debt burden.

²⁸ West Germany assumed some of the debt of the German Reich; there now being two Germanys, the West’s lower GDP partly explains the rise in the ratio.

²⁹ A few exceptions like the Roosa bonds denominated in Swiss francs that the US government marketed in the 1960s notwithstanding.

The share of advanced-economy own sovereign debt held by national central banks was small on average, at roughly 10 percent.³⁰ This share rose in the early 1930s, however, indicative of the stresses of the Great Depression, and then through the Second World War and in the immediate postwar period, when central bank purchases were part of the inflation-based financial repression through which debt ratios were reduced. The central bank share then trended downward with the development of a broader institutional investor base for government bonds starting in the 1970s, as noted above. The recent uptick in central bank holdings reflects the policy response to the Global Financial Crisis, involving quantitative easing and interventions such as the European Central Bank's Securities Market Program.

Commercial banks' holdings were more than twice as large as those of central banks over the 115-year period. They were also more volatile, again as evident in Figure 1.7. Generally, banks' holdings increased in periods of stress, such as the First and Second World Wars. A noticeable decline in this share, however, was observed from the mid-1980s, reflecting portfolio diversification facilitated by capital account liberalization and the regulatory changes (the 1988 Basel Accord, which encouraged investment in government securities from other OECD countries by attaching zero risk weights to those bonds).³¹ This decline also coincided with a rise in non-resident holdings during the Great Accumulation period and with the growth of nonbank investment funds.

B. Emerging markets

By comparison, public debts have been lower but also more volatile in G-20 emerging economies, averaging 37 as opposed to 63 percent of GDP. Debt accumulation episodes there included the 1920–1930s and 1970s–1980s (both centered in Latin America) and the 1990s (centered in East Asia). US commercial banks first gained a foothold in Latin America when European banks withdrew during the First World War and the Federal Reserve Act authorized them to branch abroad. As a result of a strong US current account and of the low interest rates maintained by the Federal Reserve System, US banks were attracted by the high rates on offer in Latin America

³⁰ This refers to debt held by the domestic central bank, not also by foreign central banks that may hold some foreign treasury securities as international reserves.

³¹ This diversification shows up as an increase in foreign holdings and a decline in commercial bank holdings of own-government bonds.

in the 1920s.³² As Latin American governments cashed in on the resulting bonanza, Argentine public debt rose from 56 percent of GDP in 1925 to 118 percent in 1932. Brazilian public debt rose from 21 percent of GDP in 1929 to 52 percent in 1933, Mexican public debt from 18 percent of GDP in 1925 to 38 percent in 1932 for the same reasons. Much of this 1920s-era debt was denominated in sterling or dollars and marketed to foreigners.

Debt ratios then fell from their early-1930s peak, as defaulted debts were restructured, GDP recovered, and budgets were broadly balanced. Suspension of interest and amortization payments, on external debt in particular, was widespread, reflecting the impact of lower levels of GDP but also weak commodity prices and restrictive trade policies in the advanced economies, which made it harder for debtors to earn foreign exchange. Not just emerging markets in Latin America but also Central European countries unilaterally suspended debt-service payments for significant periods. In some cases, restructuring agreements were negotiated with and received the endorsement of bondholders' committees only after the Second World War.³³

The debt-GDP ratio of the emerging market grouping bottomed out in 1947, at 18 percent, following the wartime period of inflation. Additional debt was then accumulated via intergovernmental and domestic borrowing, and in the 1970s through foreign-currency borrowing from money-center banks. The process was interrupted in the 1980s by debt crises, triggered by sharply higher interest rates and weaker commodity prices (Feldstein 2002; World Bank 2005). Lending resumed once the Brady Plan was launched in 1989, allowing commercial bank debts to be restructured and securitized and giving the bond market a liquid basis on which to build. Seven-plus years of crises had to be endured prior to this resolution, during which the high-income countries denied the need for principal reduction, hoping against hope that their banks could rebuild their capital cushions prior to commencing the write-down process.

But with the Brady Plan finally in place, capital flows to emerging economies resumed. A substantial fraction of these new flows financed chronic current-account deficits. Those deficits were associated with the maintenance of pegged exchange rates, which encouraged both lenders and borrowers to discount the risks of foreign-currency-denominated and indexed debt.

Many accounts of public debt in emerging markets emphasize this external aspect, although domestic debt was also important over the first part of the

³² Latin American countries floated bonds on the London market as well in the 1920s, but New York was far and away the larger lender.

³³ Some authors would include the United States in this category (see Edwards 2018).

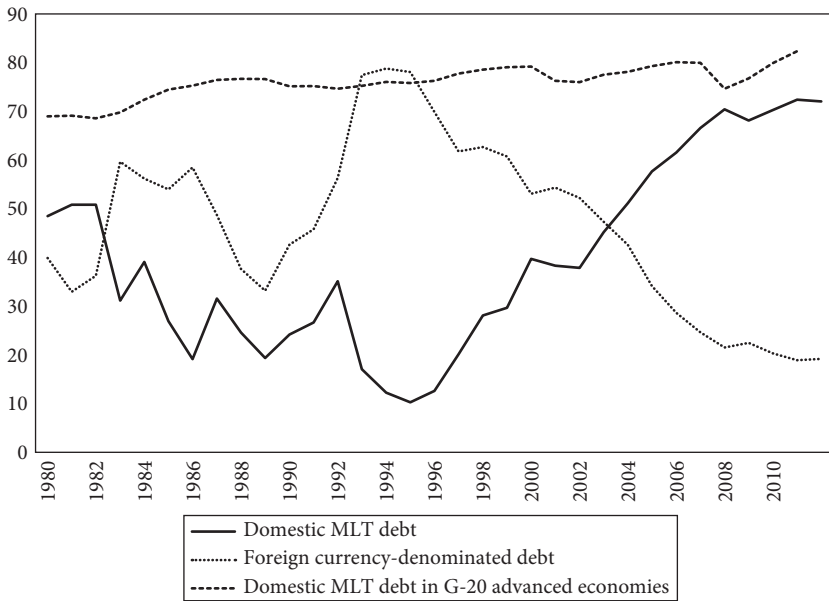


Figure 1.8 Debt composition in emerging economies (shares in % of total public debt)

Notes: G-20 emerging countries included are Argentina, Brazil, China, India, Indonesia, Mexico, Russia, and Turkey. G-20 advanced economies included are Australia, Canada, France, Germany, Italy, Japan, the U.K. and the U.S. PPP-GDP weighted averages.

Sources: Guscina and Jeanne (2006) and authors' calculations.

twentieth century, as documented by Reinhart and Rogoff (2011). The success of emerging economies in placing domestic debt came at some cost, however, in terms of maturity. Figure 1.8 confirms that in the 1980–2012 period domestic MLT debt comprised a smaller share of total debt in G-20 emerging economies than G-20 advanced economies (40 percent versus 76 percent). In a number of instances, governments straining to finance current account deficits and roll over maturing debts shortened the maturity of new placements. Mexico's notorious *tesobonos* were only the most prominent case in point.

The share of MLT debt rose after the mid-1990s, reaching close to three-quarters of the debt stock in recent years. This has led some to declare the death of “original sin.” Still, the share of debt denominated in foreign currencies remains substantially larger than in the advanced G-20 economies, averaging 46 percent of the total in the 1980–2012 period, compared to close to zero in the advanced economies. That said, after soaring as high as 80 percent in the mid-1990s, the foreign-currency share has since been declining.

Overall, the composition of emerging economies' debt has been riskier, in the sense of a higher combined share of short-term and foreign currency debt. Despite movement in recent years toward a more favorable debt structure, this conclusion still holds.

C. Low-income countries

Public debt in low-income countries (LICs)³⁴ averaged 38 percent of GDP between 1926 and 2015 but rose as high as 147 percent in the 1990s. The upturn started the 1970s, as Figure 1.5 shows. Governments, some newly established, initiated externally-financed public projects with the aim of strengthening their economies and offsetting the 1970s growth slowdown.

The hope, as always, was that economies would grow, and favorable export performance would allow debt-service obligations to be met. These optimistic expectations were shaped by prevailing macroeconomic conditions, including the commodity price boom of the early 1970s, and by enhanced access to funding sources.³⁵ In the event, much of this external borrowing was used to finance current expenditure rather than developing manufacturing or investing in infrastructure (Krumm 1985; Greene 1989), echoing the nineteenth-century experience of serial defaulters. And with the expansion of commercial borrowing, a growing share of the lending was on unfavorable terms, including short durations and variable interest rates (Figure 1.9).

The developing-economy debt crisis of the 1980s erupted in the wake of the late-1970s oil price shock, unfavorable terms of trade, recession in the advanced economies, and rising global interest rates. Private investors trimmed their exposures and, with export earnings stagnant, countries found it increasingly difficult to service their obligations, resulting in arrears and reschedulings. Many LICs responded not by cutting public spending but instead by borrowing more to fill funding gaps. Civil strife was another factor exacerbating debt burdens, for example in Nicaragua and Uganda and to a lesser extent the Democratic Republic of the Congo and Niger (Brooks et al. 1998). Although multilaterals provided support for adjustment programs, this only left the subject countries more heavily indebted (Brooks et al. 1998; Daseking and Powell 1999; Easterly 2002). As a result, debt levels rose

³⁴ See the accompanying IMF working paper for the full list of low-income countries.

³⁵ For example, the Euromarket became a source of finance for LICs that had not borrowed abroad on a significant scale before (Senegal, Togo, Kenya, Zambia, and Liberia, for instance).

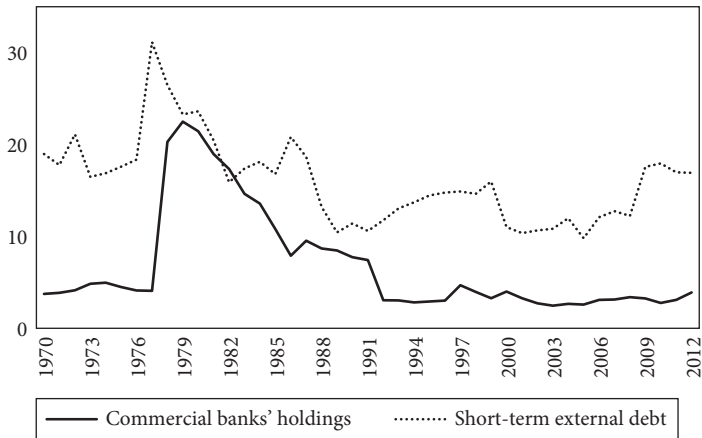


Figure 1.9 Debt composition in low-income countries (shares in % of total external debt).

Notes: PPPGDP-weighted averages.

Sources: World Bank International Debt Statistics and authors' calculations.

steadily from the early 1970s, reaching unsustainably high levels by the mid-1990s (Figure 1.5).

The IMF and World Bank launched the HIPC Initiative in 1996 to provide comprehensive debt relief to the poorest heavily-indebted countries.³⁶ The initiative was expanded in 1999 to allow for faster, deeper, and broader relief, and supplemented in 2005 by the Multilateral Debt Relief Initiative (MDRI).³⁷ Of the thirty-nine countries potentially eligible for HIPC Initiative assistance, thirty-six (of which thirty are in Africa) received the full amount of debt-relief for which they were eligible through HIPC and the MDRI.³⁸

According to Easterly (2002) and Gautam (2003), the overall success of the initiative was attributable to two factors. First, relief was conditional on establishing a track record of sound policies, thus avoiding incentives to over-borrow and delay necessary reforms. Second, the initiative was comprehensive: it was a once-and-for-all program in which all creditors, including multilaterals, participated.

³⁶ There had been earlier, more limited initiatives along these lines, as described by Easterly (2002). The limited success of these earlier programs in part reflected the revealed preference of debtors for high debt; the granting of progressively more favorable terms for debt relief may have perverse incentive effects (Easterly 2002).

³⁷ This was intended to accelerate progress toward the United Nations Millennium Development Goals.

³⁸ See the accompanying IMF working paper for a list of the countries that have received or potentially been eligible to receive debt relief under the HIPC initiative.

6. Two Debt Accumulation Episodes

In this section we hone in on the Great Depression and the Great Recession, the two peacetime periods of rapid debt accumulation in the advanced economies. Our discussion follows the debt decomposition approach described earlier.³⁹

Though there were parallels between the two episodes, there were also differences. Output and employment losses were much larger during the Depression: real GDP in G-20 advanced economies declined by 4 percent peak-to-trough during the Great Recession but by 19 percent in the Depression. Median unemployment rose to 25 percent at the height of the Depression but remained in the single digits in the Great Recession.

Despite the more severe impact on the real economy, the increase in the debt-to-GDP ratio was less in the Great Depression (24 versus 40 percentage points of GDP). The explanation for the conjuncture of higher output and employment losses with a smaller deterioration in public finances lies in the nature of the policy response and in the initial conditions, that is, the level of public debt at the onset of the crisis.

Table 1.3 suggests that about two-thirds of the increase in the advanced-economy debt ratio during the Great Recession was accounted for by the cumulative increase in the primary deficit, reflecting revenue losses on the back of sluggish growth in the aftermath of the financial crisis and, to a lesser extent, expansionary fiscal policies (IMF 2013).

Table 1.3 Decomposition of select large post-1914 debt increases

	(Contribution to debt increase, percent as share of total)		
	Primary balance	Interest-growth differential	Stock-flow adjustment
Great Depression (1928–33)	–9	108	1
Great Recession (2007–13)	67	25	8

Notes: Countries included are Australia, Canada, France, Germany, Italy, Japan, the UK, and the United States. PPPGDP-weighted averages, cumulative over the episode years.

Source: Abbas et al. (2014a) and authors' calculations.

³⁹ The precise years for which the debt decomposition is conducted for each individual country varies so as to capture trough-to-peak (peak-to-trough) in its buildup (consolidation) episode. We focus on sustained changes in debt ratios rather than temporary reversals that were small relative to the duration and size of the episode identified.

In the United States, the stimulus package enacted in early 2008 targeted tax cuts at low- and middle-income families. This was followed by tax relief for first-time homebuyers and by the 2009 American Recovery and Reinvestment Act (ARRA), which authorized nearly \$800 billion of stimulus. The largest countercyclical fiscal action in US history, the ARRA, had important implications for the debt ratio. Australia, Canada, Germany, Japan, and the UK similarly enacted fiscal stimulus packages by late 2008.

By comparison, there was little discretionary countercyclical fiscal action in the 1930s. Where the primary balance accounted for two-thirds of all debt accumulation in 2007–13, its contribution was negative in 1928–33, when primary balances were, on average, in surplus.⁴⁰ In the United States, however, the Revenue Act of 1932 increased tax rates with the goal of balancing the federal budget. The New Deal, initiated in early 1933, included new programs aimed at generating recovery but represented only a modest and temporary countercyclical fiscal expansion (Brown 1956).⁴¹

The UK, like the United States, did not make much use of fiscal expansion in the early stages of its recovery (Middleton 1984). France raised taxes to defend the gold standard in the first half of the decade but then ran substantial budget deficits only after 1936.⁴² Germany and Japan, however, saw large increases in government spending from the mid-1930s. The German budget deficit as a percent of GDP increased little initially but grew substantially after 1934 as a result of public works and rearmament (Thomas 1934). Japanese government spending, particularly military spending, rose sharply between 1932 and 1934, resulting in substantial budget deficits (Almunia et al. 2010). This fiscal stimulus, combined with monetary expansion and an undervalued yen, returned the Japanese economy to full employment relatively quickly.

Another difference is the role of SFA, which contributed more to the increase in the debt ratio in the Great Recession. This reflected extensive financial sector support in several advanced economies and loans to support the housing sector, which were not recorded as spending and therefore show

⁴⁰ Governments were smaller during the Great Depression—the expenditure-to-GDP ratio averaged 8 (40) percent during the Great Depression (Great Recession). Larger governments were associated with bigger automatic stabilizers, which contributed more to the deterioration in the fiscal balances compared to the Great Depression.

⁴¹ Starting in 1933, the United States took monetary measures to prevent prices (and nominal GDP) from falling further and from increasing the contribution of the growth–interest differential even more. The Roosevelt Administration took the country off the gold standard and devalued the dollar against gold by approximately 50 percent. Romer (1992) points to the associated monetary expansion as the main factor supporting the recovery of real GDP in the subsequent period.

⁴² The expansionary effect of these deficits, however, was counteracted by a legislated reduction in the French workweek—a change that raised costs and depressed production (Cohen-Setton et al. 2017).

up as contributions of the SFA to debt dynamics.⁴³ Governments intervened in distressed financial systems and industry in the 1930s as well, but they relied, on average, more on approaches that did not increase recorded sovereign debt.⁴⁴

But the small *average* contribution of the SFA to the debt buildup in this period masks cross-country variations. The SFA contributed more, for example, to the rise in debt in a small subset of our countries, most notably Japan, where it reflected the operations of the Industrial Bank of Japan, which engaged in extensive off-balance-sheet transactions. France, where the SFA adjustment made the largest negative contribution to debt accumulation, remained on the gold standard throughout the period analyzed here, when countries such as the United States depreciated their currencies. We suspect that the negative SFA for France reflects reductions in the burden of foreign-currency-denominated debt, supported by the maintenance of the gold standard (the opposite of the country's experience in the first half of the 1920s).

Hence, the Great Depression debt surge was fully accounted for by the growth rate–interest rate differential, reflecting the large negative shock to output and employment. Eventually currency devaluations enabled central banks to cut policy rates and then stabilize and raise prices, translating into a reduction in real interest rates. These policies, along with relatively low initial debt levels, contained the impact of the interest-rate component on debt dynamics. They help explain why the increase in debt ratios, in percentage point terms, was smaller than in the Great Recession.⁴⁵

Debt maturities and the composition of debt holders also evolved differently (Table 1.4). During the Great Depression, the share of domestic short-term debt increased as governments were forced to accept less favorable conditions (shorter maturities) on new issues.⁴⁶ The period also saw a fall in the share of non-resident holdings, consistent with the decline in trade and capital flows, the imposition of capital and exchange controls, and defaults on external obligations. Commercial bank holdings of government securities rose as investors substituted away from other riskier investments.⁴⁷

⁴³ Changes in governments' financial assets (which capture, among other items, loans to other sectors) accounted for about 90 percent of the SFA term, on average, over this period.

⁴⁴ In many cases, support for the financial sector was provided by the central bank or in the form of government guarantees and not reported as an increase in government spending, government financing or public debt. For example, German banks were kept afloat by central bank liquidity provision and government guarantees, financial injections that never showed up on the government's balance sheet.

⁴⁵ Advanced-country debt was higher in 2007 than at the start of the Great Depression (84 versus 57 percent of GDP). For the same output and unemployment shock, the snowball effects on public debt were therefore larger starting in 2008.

⁴⁶ This shift was especially evident at the onset of the Depression.

⁴⁷ On the increase in commercial banks' holdings see League of Nations (1934), Appendix III.

Table 1.4 Shifts in advanced economies' debt composition, select debt buildup episodes

(Shares in percent of total debt, PPPGDP-weighted averages)				
Great Depression	1928	1933	Change	Cumulative annual change (1931–33)
Short-term debt	8	15	7	1
Central bank holdings	2	7	5	3
Commercial banks' holdings	28	30	3	2
Non-resident holdings	12	11	–2	–2
Great Recession	2007	2011	Change	Cumulative annual change (2009–11)
Short-term debt	20	17	–2	–8
Central bank holdings	7	9	2	5
Commercial banks' holdings	11	12	1	0
Non-resident holdings	28	34	6	3

Notes: Countries included are Australia, Canada, France, Germany, Italy, Japan, the UK, and the United States. Averages in PPP-GDP weighted terms.

Sources: Abbas et al. (2014b) and authors' calculations.

The Great Recession, in contrast, saw a shift away from short-duration debt.⁴⁸ Central bank holdings increased in both periods, although Table 1.4 shows that their holdings rose more rapidly after 2009 than after 1931.⁴⁹ Starting in 2008, demand by commercial banks was sustained by continuing to attach zero risk weights and capital charges to sovereign obligations from OECD countries. Demand by non-residents, for US government debt in particular, picked up despite low yields, reflecting flight to safety and the so-called safe-asset shortage. Non-resident holdings had climbed on the back of financial innovation and globalization, enabling countries to finance their deficits by issuing MLT debt to both domestic and non-resident holders while reducing their reliance on central banks.

7. Two Debt Consolidation Episodes

In Section 5, we discussed three cases of countries that successfully reduced their debts in the pre-1914 era. Here, we turn to two prominent consolidation

⁴⁸ There was however a move towards shorter maturity and foreign currency debt issuance in some more troubled Eurozone countries, Cyprus, Greece, Ireland, and Portugal for example (De Broeck and Guscina 2011).

⁴⁹ In the case of the Great Depression, the increase in central bank holdings evident in the top panel of Table 1.4 is largely driven by Japan.

episodes in the advanced economy following the two twentieth-century world wars. Very different approaches, it turns out, were pursued in the two periods.

A. Advanced-economy debt consolidation after the First World War

In the interwar period, advanced economy debt reductions were achieved partly through economic growth, partly through restructurings of external obligations, and partly through primary surpluses. The growth-interest differential contributed less in the 1920s than after the Second World War, given that the twenties were a period of deflation, not inflation.⁵⁰ Balanced budgets were the norm; net of interest payments, those budgets delivered primary surpluses that helped to reduce debt ratios (Table 1.5). However, the SFA worked against consolidation. This term was driven by France, which had significant dollar-denominated debt in the early 1920s.⁵¹ Depreciation of the franc increased the burden of those debts, which shows up as a negative SFA (and an increase in the debt ratio) in a period of consolidation (when debt is being reduced).

Rescheduling of bilateral government credits in the early 1920s postponed repayments to the United States and the UK without reducing the nominal debt burden.⁵² These maturity extensions, evident in Table 1.6, were facilitated by the fact that a substantial fraction of this debt was held by the foreign official sector, reflecting inter-government obligations incurred during the war. The share of foreign-currency-denominated debt remained relatively high. It increased further in the immediate post-First World War period, as foreign loans from the United States to Europe were used to fund relief and reconstruction. That the share of foreign-currency denominated debt was high meant that it was not easily inflated away.⁵³

Ultimately, the overhang was removed by large-scale war-debt reduction, which also delivered a fall in the share of foreign-denominated debt (Table 1.6).

⁵⁰ Instances of hyperinflation, which had a powerful impact in eroding the burden of MLT debt, notwithstanding to the contrary.

⁵¹ The sizable dollar denominated debt was incurred as a result of the four liberty loans the United States extended to France during the First World War. In the early 1920s, the share of foreign-denominated debt rose significantly in France (from 24.5 percent in 1921 to about 40 percent in 1925) and stabilized at that level through the early 1940s.

⁵² Select war debt reprofilings occurred later (e.g., Austrian debt to the United States in 1930 and Romanian debt to the UK in 1937), but since these are not G-20 countries these reprofilings are not reflected in our calculations.

⁵³ Table 1.5 (and Figure 1.5 above) do not include reparations obligations from Germany as public debt; doing so would greatly alter (and dominate) the analysis.

Table 1.5 Decomposition of select large post-1914 debt reductions

	(Contribution to reduction, percent as share in total)		
	Primary balance	Growth–interest differential	Stock-flow adjustment
Post-First WW (1921–29)	64	53	–16
Post-Second WW (1945–75)	46	75	–21

Notes: For post-First World War, the countries (episodes) included are: Canada (1922–28); France (1921–26), the UK (1923–29), the United States (1921–29). For post-Second World War, countries (episodes) included are: Australia (1946–63), Canada (1945–57), France (1949–69), the UK (1946–75), and the United States (1946–74). PPPGDP-weighted averages, cumulative over the episode years.

Sources: Abbas et al. (2014a) and authors' calculations.

Table 1.6 Shifts in advanced economies' debt composition, select debt reduction episodes

	(Shares in percent of total, PPPGDP-weighted averages)			
Post-First World War	1922	1929	Change	Cumulative annual change (1922–25)
MLT domestic debt	66	73	6	7
Foreign currency debt	12	13	1	6
The 1930s	1932	1939	Change	Cumulative annual change (1932–35)
Short-term debt	15	14	–1	2
Foreign currency debt	14	5	–9	–5

Notes: Countries included are Australia, Canada, France, Germany, Italy, Japan, the UK, and the United States. PPP-GDP weighted averages.

Sources: Abbas et al. (2014b) and authors' calculations.

The Hoover Moratorium in 1931 allowed fifteen European countries to suspend their war-debt payments to the United States, and at the 1932 Lausanne Conference the UK's wartime allies were permitted to temporarily suspend their payments. These suspensions were recognized as permanent in 1934. War debt relief accounted for 36, 43, and 52 percent of 1934 GDP for France, Greece, and Italy respectively (Reinhart and Trebesch 2014). In Germany, external public debt contracted in the second half of the 1920s was written down unilaterally in 1933–34, when the National Socialist regime was no longer deterred by ensuing damage to its commercial and diplomatic relations (Ritschl 2013).

B. Advanced-economy debt consolidation after the Second World War

Post-Second World War debt consolidation, from the mid-1940s through the mid-1970s, was the most dramatic such episode in the twentieth century. G-20 advanced economy debt reached 140 percent of GDP in 1946, as noted, before falling to 30 percent by 1974. Three-quarters of the reduction was accounted for by the growth-rate–interest-rate differential, with primary surpluses playing a smaller role (Table 1.5). The favorable differential reflected reconstruction of the international economy, strong investment, and successful catch up (Eichengreen 1996). Also important were negative real interest rates (Figure 1.10) supported by restrictive domestic financial regulation, widespread capital controls, and persistent inflation (Reinhart and Sbrancia 2015). Regulatory restrictions included interest rate ceilings and reserve requirements on banks, prudential floors on pension fund assets to be held as government securities, caps on bank deposit rates, and restrictions on cross-border foreign exchange transactions.⁵⁴ Exchange and capital controls were applied in the 1930s and persisted after the Second World War. The

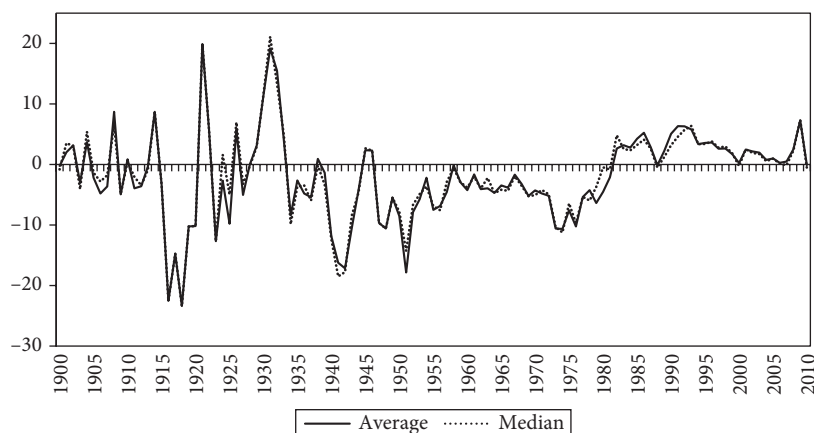


Figure 1.10 Interest–growth differential in advanced economies (difference in % points)

Notes: G-20 advanced countries included are Australia, Canada, France, Germany, Italy, the U.K. and the U.S.

Source: Abbas et al. (2014a).

⁵⁴ Before the Second World War there was a gradual shift towards heavier regulation in response to the financial crises of 1929–32. The legacy of these crises made it easier to package those policies as “prudential.”

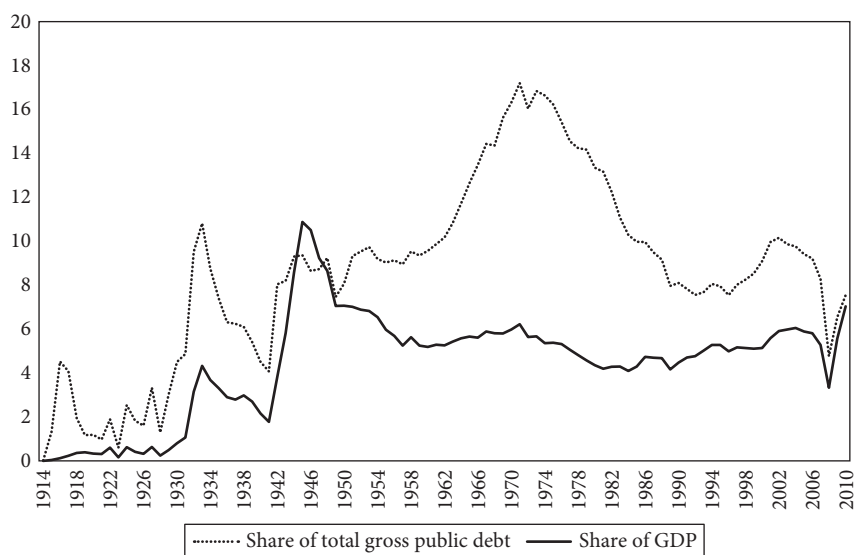


Figure 1.11 Central bank holdings of government debt in the United States (in %)

Source: Abbas et al. (2014a).

international bond market remained quiescent, demoralized by earlier defaults and by the Johnson Act. Governments consequently shifted toward domestic funding. Central bank holdings of government paper were high in this period, and to the extent that their accumulation represented the monetization of fiscal deficits, they facilitated inflation. In the United States, the central-bank share of government debt reached a record 17 percent of gross debt in the early 1970s (Figure 1.11). The accumulation of government debt by the Fed in the pre-1951 Accord period is well-known (see e.g., Eichengreen and Garber 1991): the central bank accumulated public debt as needed to maintain the Treasury-dictated ceiling on interest rates. That the share of gross debt on the central bank's balance sheet again rose strongly in the 1960s is perhaps less widely appreciated.

The roles of inflation and central bank financing in these consolidations differed. Japan experienced high inflation from 1946 through 1949.⁵⁵ (The twelve-month change in retail prices in Tokyo peaked at more than 700 percent in late 1946.) In the UK, in contrast, the roles of inflation and central bank financing were less, and the rate of debt reduction was only half as fast.

⁵⁵ The Dodge Line Stabilization took place in mid-1949, but even then, it took an additional six months for inflation to come down to single-digit levels.

Table 1.7 Shifts in select advanced economies' debt composition, post-Second World War

Country (Episode years)	Debt reduction relative to initial debt level	No. of years	Average debt reduction per year	Average inflation	MLT domestic debt	CB holdings
	(percent)	(years)	(percentage points of GDP)	(percent)	Change in shares to total debt (percent)	
UK (1946–80)	85	35	6	7	21	6
Japan (1946–64)	98	19	11	42	–33	40

Sources: Abbas et al. (2014b) and authors' calculations.

But faster debt reduction in Japan, achieved through inflation, came at the expense of significant maturity shortening, reflecting declining investor appetite for long-dated securities (Table 1.7).

The SFA again slowed debt reduction after the Second World War. But in contrast to the aftermath of the First World War, when the negative contribution of the SFA was limited to France, after the Second World War a large contribution of the SFA was common across G-20 advanced economies. Nationalizations, subsidies for loss-making public enterprises and other below-the-line operations contributed to this negative SFA and thereby to increases in debt, partially offsetting the effects of primary surpluses and a favorable growth-rate–interest-rate differential in this period of consolidation.⁵⁶

C. Implications for today

Countries have pursued two broad approaches to debt reduction. The orthodox approach relies on growth, primary surpluses, and the privatization of government assets. In turn, this encourages long debt duration and non-resident holdings. Heterodox approaches, in contrast, include restructuring debt contracts, generating inflation, taxing wealth and repressing private finance. This in turn discourages foreigners from holding the government's obligations and investors from holding long-duration debt.

⁵⁶ The inflation and growth slowdown of the early 1970s may have added further to this effect, insofar as pressure for increased spending was accommodated, but governments sought to hide it from voters and the bond market.

Today, financial repression is unlikely to be as effective as after the Second World War. Repression then relied on tight financial regulation, capital controls, and limited investment opportunities. Today, a much larger share of advanced economy debt is held by non-residents, and a lower share by banking systems, making it more difficult to maintain a captive investor base that accepts debt offering sub-market returns. In addition, regulatory measures compelling banks to hold domestic government debt and then attempting to inflate it away could threaten financial stability in the financially-competitive low-growth environment of the twenty-first century.⁵⁷

The value attached to price stability by central banks and retail investors in government bonds in turn limits the political viability of surprise inflation. Higher inflation would also have indirect costs, in the form of a persistent departure from less risky long-duration debt. Governments would be trading off lower short-run debt-servicing costs for higher costs and heightened volatility in the future. We saw this in the case of Japan in the previous subsection. Thus, not only would financial repression be difficult to implement under present circumstances, but its negative side-effects would persist.

8. Conclusion

For hundreds if not thousands of years, sovereigns have borrowed to secure borders and to fight foreign military campaigns. The nineteenth century was a transitional period when governments, while still borrowing to prosecute wars, issued debt to build roads, railways, and ports and to invest in education. The twentieth century then saw sharp increases in debt burdens as a result of major wars but also as a result of recessions, banking panics, and financial crises, and of the public-policy responses to these events. The end of the last century also saw, for the first time, a secular increase in public-debt-to-GDP ratios in a variety of countries in conjunction not with wars and crises but in response to popular demands on governments for pensions, health care, and other often unfunded social services.

Debasement and restructuring also have a long history. In the eighteenth and nineteenth centuries, some governments went to extraordinary lengths to service and repay heavy debts incurred as a result of expensive wars (recall the examples of Britain, the United States, and France in Section 4). Britain

⁵⁷ Further, higher bank holdings of own sovereign debt can increase exposure to a negative feedback loop between the sovereign and banks, as was demonstrated recently in the euro area sovereign debt crisis.

ran primary surpluses for the better part of a century, the United States for five decades. In part this reflected the political influence of creditors. It reflected the fact that the franchise was not yet universal and that contemporary perceptions of the role of government were different from today. It reflected the recognition by decision-makers that the maintenance of debt-service payments, even when difficult, could deliver lower borrowing costs in normal times and aid with the mobilization of resources in the military and economic crises not infrequently faced by eighteenth and nineteenth century governments. Not least it reflected good luck—that Great Britain was not confronted with an equally costly war between 1815 and 1914 or the United States between 1865 and 1917, and that there was no economic slump as deep and long as the Great Depression of the 1930s (Grossman and Han 1993). Governments following this path found themselves able to issue debt at favorable interest rates, long maturities, and in their own currencies (Bordo, Meissner and Redish 2005).

Not all governments were able to implement this good equilibrium, however. Some countries defaulted and restructured their debts, often repeatedly. Inflation and financial repression were used to reduce domestic claims on the public sector. Episodes like that in the third quarter of the twentieth century, when high advanced economy debts were brought down through a combination of rapid economic growth and budgetary discipline, were exceptions to this rule.

We started with the observation that public debt is a Janus-faced asset class. History amply fleshes out this portrait.

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Concepts, Definitions and Composition

*Serkan Arslanalp, Wolfgang Bergthaler, Philip Stokoe,
and Alexander F. Tieman*

1. Introduction

In February 1989, workers in New York were putting the finishing touches to a very special clock. The brainchild of New York real estate developer Seymour Durst, the 11-by-26-foot digital clock cost \$100,000 and was erected one block from Times Square. The clock was the US National Debt Clock and since then, apart from a brief period between September 2000–July 2002 when debt was falling, the clock, and its replacement installed in 2004, has steadily tracked the rise in US debt, from \$2.7 trillion when the clock was unveiled in February 1989, to \$22.4 trillion at August 13, 2019.

According to Mr. Durst’s son, his father had been obsessed with debt since the early 1980s. In 1980, during the holiday season he sent cards to members of the US congress which included the message “Happy new year. Your share of the national debt is \$35,000.” Mr. Durst’s idea has inspired others, and a google search for “debt clock” quickly takes you to numerous websites with debt clocks for countries all over the world. There is just one problem with all these clocks, which is this. *What do they measure?*

Mr. Durst’s clock tracks a concept of debt that the US Treasury calls “Total Public Debt Outstanding.” This figure was \$22.0 trillion at December 31, 2018. But there are other estimates of debt for the United States. The IMF World Economic Outlook (WEO) Database publishes an aggregate called “general government gross debt.” The April 2018 database presents this number at the end of 2018 as \$21.7 trillion—a difference of \$270 billion (approximately 1.3 percent of GDP). The IMF also publishes data on government liabilities in the Government Finance Statistics (GFS) database, drawing on data reported

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to the IMF's Statistics Department by the US Bureau of Economic Analysis and Federal Reserve Board. This database shows total liabilities of the US general government of \$28.4 trillion, \$6.8 trillion higher than the WEO number, and \$6.4 trillion higher than on the debt clock (almost 19 percent of GDP). The IMF's Fiscal Affairs Department (FAD) has also compiled data for total public sector liabilities for the United States (IMF 2018). This experimental data set estimates US public sector liabilities to be almost \$36 trillion in 2016, a figure almost twice the number on the New York clock.

Finally, academics such as Larry Kotlikoff and some politicians have claimed the real number is higher still. Senator Ben Sasse, a Republican from Nebraska, made waves in an April 2017 town hall meeting in Elkhorn, Nebraska, by asserting that the real value of public debt was between \$70–75 trillion—more than three times the value shown on the debt clock during 2017. The *Washington Post* factchecked this assertion and awarded Mr. Sasse “one Pinocchio” on their fact checking scale (which runs from one to four pinocchios), which they say could be viewed as being “mostly true.” Kotlikoff was widely quoted in 2015 as saying the true debt figure for the United States then was \$210 trillion, a figure which was arrived at through so called “generational accounting,” which defines government debt as the net present value of future government cash flows—which if true would clearly mean Mr. Durst should have installed a significantly bigger clock.

The truth is, the value of debt is hugely dependent on three factors: the institutional coverage of the debt; the instrument coverage of the debt; and the valuation of the debt. The different measures of debt discussed above cover different parts of the American government or wider public sector, include different kinds of government liabilities and/or contingent liabilities, and use different valuations. Globally, different countries use different concepts of debt, making cross-country comparability of sovereign debt difficult.

In any discussion of sovereign debt, public debt, national debt, or government debt, the *definition* of debt matters enormously. What kind of liabilities are included, belonging to which entities, and how they are valued is the difference between debt for the United States being as little as \$15 trillion or more than \$70 trillion. Indeed, it might be more accurate to say that there isn't a single measure of sovereign debt, but a number of complementary measures that policymakers can use to understand their fiscal position and the sustainability (or not) of their fiscal position. Section 2 of this chapter discusses these key concepts of institutional coverage, valuation, and instrument coverage which are critical to any discussion of sovereign debt.

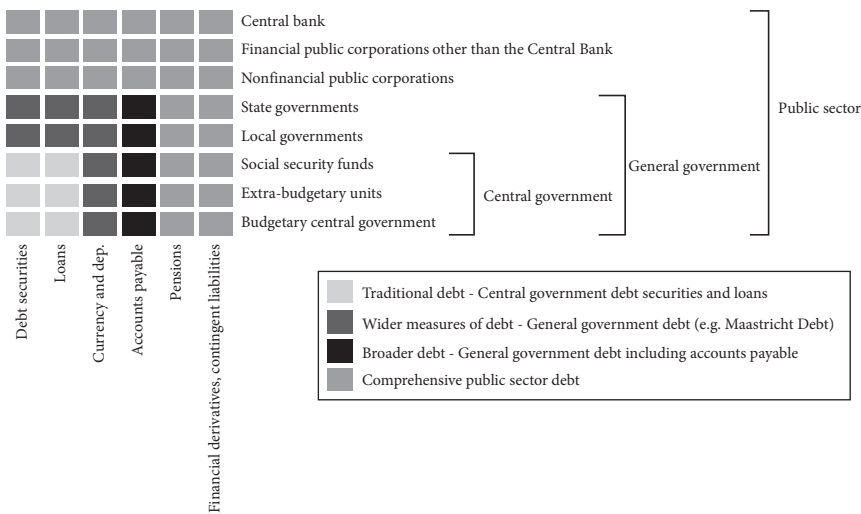


Figure 2.1 Debt in two dimensions

These concepts are illustrated in Figure 2.1, which shows the institutional coverage and instrument coverage dimensions of debt. Focusing on a narrow measure of debt, such as just the narrowly defined debts of the central or even general government may mean analysis overlooks significant liabilities and sources of fiscal risk for the government or in the wider public sector.

Section 3 looks specifically at the public sector as the broadest possible concept of coverage, building on IMF (2018). In doing so it recognizes public sector assets as well as liabilities. These assets may reside inside the general government, or in public corporations (often referred to as state-owned enterprises or SOEs), outside the standard government accounts but nevertheless controlled by the state. Taken together, these elements provide the most comprehensive view of public wealth, in the form of a country's public sector balance sheet (PSBS). In most countries, the PSBS is little understood, poorly measured, and only partly managed, with analysis instead focused on "standard" fiscal flows—revenues, expenditures, and deficits—and gross debt. This misses large swaths of government activity and can fall victim to illusory fiscal practices.

Finally, whatever the level of debt, the composition of the debt, in terms of the currency it is issued in, the maturity profile, and the nature of the creditor to whom debt is owed can be very important for debt management and sustainability. Section 4 of this chapter discusses the composition of debt from a debtor (supply) and creditor (demand) perspective.

2. Measures of Sovereign Debt

A. Institutional coverage of debt

This book is about “sovereign debt,” but this is a slippery concept. Online sources have numerous definitions, including debt of the national government,¹ debt of the central government,² government debt in a currency other than a government’s own national currency,³ or debts owed or guaranteed by the national government.⁴ Some consider sovereign debt to include just the liabilities of the central government, some extend this concept to also include the debts of the Central Bank. Finally, some people use the term *sovereign debt* interchangeably with the term public debt⁵ and public debt interchangeably with the term government debt⁶ but these may not refer to the same thing.

Assuming that sovereign debt is only the debt of government, what is the definition of *government*, given that the nature and structure of government differs significantly across countries? Consider the G7 economies; within this group are three countries with federal systems of government (Canada, Germany, and the United States; and four countries with more centralized systems (France, Italy, Japan, and the UK). Because of this, comparing the debt of the Federal Government of Canada, or Germany, or the United States with the debt of the Central Government of the other four G7 countries will be highly misleading. Instead, most statisticians would argue that debt should be compiled for the *general government*,⁷ a broader concept that includes all government entities whether these are national governments with jurisdiction over the entire country; state, provincial, or regional governments (such as Ontario, Texas, or Western Australia); or local governments and municipalities. General government also includes a group of entities called social security funds, which administer social insurance schemes for pensions, health, and unemployment benefits.

¹ <http://lexicon.ft.com/Term?term=sovereign-debt>

² <https://www.investopedia.com/terms/s/sovereign-debt.asp>

³ <https://www.collinsdictionary.com/dictionary/english/sovereign-debt>

⁴ <https://blogs.imf.org/2017/02/23/dealing-with-sovereign-debt-the-imf-perspective/>

⁵ <https://www.thebalance.com/what-is-the-public-debt-3306294>

⁶ <https://www.focus-economics.com/economic-indicator/public-debt>

⁷ This concept of general government is defined in statistical manuals like the UN System of National Accounts 2008, the IMF Government Finance Statistics Manual 2014, the IMF Public Sector Debt Statistics Guide for Compilers and Users 2011 and is used by the European Union in their regional statistical manual, the European System of Accounts 2010, which is the statistical underpinning for Maastricht Debt—defined as general government consolidated gross debt.

Government units, in the statistical manuals, are defined as legal entities established by political processes that have legislative, judicial, or executive authority over other entities within a given area with responsibility for the provision of public goods and services, to redistribute income and wealth; that engage primarily in non-market production; and that are financed primarily out of taxation, or other compulsory transfers. While this definition is relatively easy to apply for many government units, at the borderline, there are numerous grey areas. General government in many countries includes entities that a lay person might not consider to be part of government, such as public transport companies, publicly owned financial institutions (such as EXIM or Development Banks), or other state-owned enterprises.

In addition to government units, the manuals recognize the existence of a wider public sector. This includes entities under public control that do not meet the definition of a government unit. These entities are typically said to be engaged in market production, selling goods and services to households and businesses on a market basis. Often referred to colloquially as state-owned enterprises or public enterprises, statisticians refer to these publicly owned and/or controlled non-government entities as *public nonfinancial corporations* or *public financial corporations* (see Figure 2.2). They can take any form and operate in any industry. The size and complexity of the public sector varies considerably, across countries and over time. Section 3.C takes this broadest possible institutional coverage of public finances as its point of departure. In China and Russia, the public sector is extensive and covers many or almost

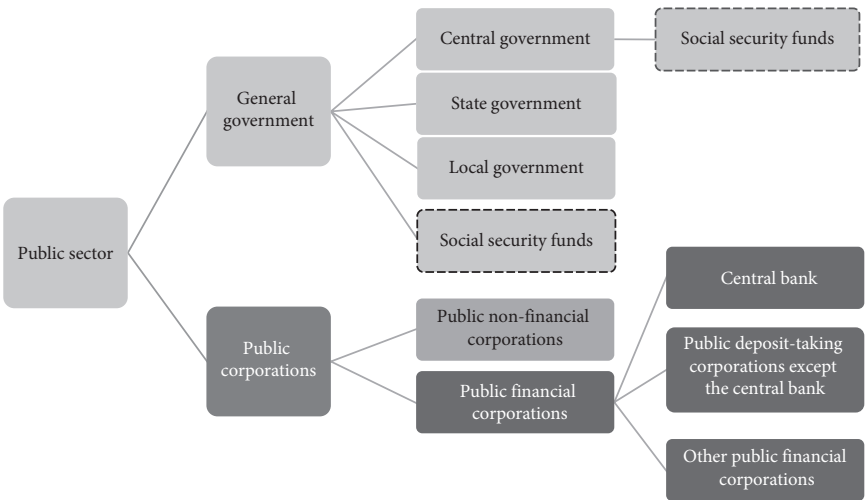


Figure 2.2 Public sector and its main components

all of the main parts of the economy. In other countries public ownership is much less extensive. In the UK the public sector in 2018 looks considerably different to the public sector in 1980, following waves of privatization (see Case Study 2.1) Entities are considered to be public units if they are controlled, rather than owned by the government (reflecting government's unique ability to intervene in an economy), but while this is often easy to recognize, at the

Case Study 2.1 Gaming the perimeter—Network Rail (UK)

During the 1980s and 1990s, the UK Government privatized many formerly state-owned enterprises. Over the fifteen years from 1981 the UK sold off British Sugar, British Telecom, British Gas, British Airways and the British Airports Authority, British Steel, British Coal, Water, and Electricity companies, and many more.

In 1996 the government concluded the privatization of the UK's rail industry via a complex privatization whereby the old British Railways Board was split into many separate companies, including separate units responsible for managing the infrastructure, passenger rolling stock, six separate freight companies, six track renewal units, seven infrastructure maintenance units, and a number of other companies.

The infrastructure company was Railtrack PLC, which debuted on the London Stock Exchange in May 1996, but very quickly things began to go wrong. The new government ultimately pulled the plug on Railtrack and in October 2002 placed control over the infrastructure under a new company, a not-for-profit entity called Network Rail.

Network Rail was carefully established by the government to be classified outside of the public sector. Consequently, despite the extensive subsidies being provided to the firm, the UK Office of National Statistics (ONS) classified Network Rail as part of the private sector from shortly after its creation, from March 2003. Network Rail remained classified outside of the public sector for the whole of the 2000s, even as its debt steadily climbed.

By the end of 2007 Network Rail Ltd had amassed liabilities of £25bn, including £18.5bn of loans. At the time, UK public sector net debt stood at £535.7bn or 37.8 percent of GDP. The careful structuring of Network Rail had enabled the UK government to keep debt of more than 1 per cent of GDP off the books!

Continued

Case Study 2.1 *Continued*

By 2011, the classification of Network Rail was coming under strain. In January 2011 the European Union Statistical Authority (Eurostat) first raised the issue of the classification. In 2013, Eurostat raised the issue again, pointing to new statistical guidance. Meanwhile Network Rail's debt had continued to rise. By the end of 2012 its liabilities had climbed to over £39bn, including £29bn of loans—almost 2 percent of GDP. Faced with new guidance, and a skeptical Eurostat, the ONS reached a new conclusion in December 2013 and retrospectively reclassified Network Rail as part of the public sector back to 2004. Not only that, the company should be classified as part of general government.

With the stroke of a statistician's pen, UK public sector and UK general government debt was rewritten. By the time Network Rail was reclassified, the UK's debt had already ballooned as the effects of the financial crisis continued to be felt, such that the inclusion of Network Rail's debt, and even larger debts (such as those of registered social landlords) was a relatively small drop in the ocean, but had these classification decisions been applied during the mid-2000s, it is likely that UK rail policy would have been significantly different if "putting things on the Network Rail credit card" had also meant being recorded as government or public sector debt.

borderline things again can be tricky (for examples see, e.g., Mano and Stokoe 2017 or Box 1.3 in IMF 2018).

State-owned banks or other public financial corporations have particular implications for public sector debt, as they will invariably have large balance sheets, and thus large liabilities or debts. Public sector debt for countries with many publicly owned banks will look very different, and much higher, than countries with few or no publicly-owned banks. In Germany, public financial corporations including the publicly owned Landesbanken and Sparkassen have total liabilities of approximately 100 percent of GDP. France, with far less extensive public ownership of financial corporations, has public financial corporations with less than half of the German total.

The Central Bank presents a final, special case. By long standing convention, the National Central Bank is not classified inside the general government, but instead classified as a public financial corporation, even though in many ways it resembles a government unit. In some countries Central Banks are said to be "independent," in others, the Central Bank has much

less operational independence. However Central Banks can and do issue debt of their own and have considerable liabilities. Recognizing this reality, central banks' debt may be included in a sovereign's debt restructuring at the election of the sovereign (Hagan 2005). This has important implications for government or sovereign debt, and makes country comparisons difficult between countries where Central Banks issue their own bonds and debt instruments to manage liquidity, and the majority of countries whose Central Banks do not do this and instead use government issued instruments like Treasury Bills to manage liquidity.

In addition, the exclusion of the Central Bank from general government also has implications for sovereign debt if the Central Bank acts as a creditor to the government. While historically this has often been the case in developing or emerging market economies, in recent years it has also become a feature of advanced economies, especially in those countries that have engaged in quantitative easing (QE). Returning to the United States, after 10 years of QE, a significant part of the US public sector debt is now held by the US Federal Reserve (the Fed). In Q1 2018 the Fed held \$2.4 trillion of Federal Government securities, 14 percent of the total stock. The Fed held a further \$1.7 trillion of Fannie Mae and Freddie Mac debt securities, around a quarter of Fannie and Freddie's total debt. In the UK, the Bank of England Asset Purchase Facility (the entity established by the Bank of England as the vehicle for QE) holds UK government gilts worth £435 billion, this is around 20 percent of the total UK gilts owed by the UK government and means that a large part of the UK general government debt is owed to the wider public sector. The Bank of Japan, which has also engaged in significant QE over a long period, holds Japanese Government securities worth ¥457 trillion, this is almost half of the Japanese general government liabilities in the form of debt securities, which stood at ¥996 trillion at the end of 2016. This growth in Central Bank holdings of government debt, can be seen in Figure 2.3.

Institutional coverage of sovereign debt or national debt reported at the national level varies considerably, presenting challenges for cross country analysis (see Annex 2.A). In advanced economies, most countries will compile statistical measures of general government debt, in line with the statistical manuals. This includes in the European Union, where all countries are required to compile and report Maastricht Debt, which is general government consolidated gross debt in line with the European System of Accounts 2010. However, at the national level the headline national measures of debt are often something else. This is true in a number, but not all, federal countries. In the United States, the headline measure of debt, that features on Mr. Durst's clock, is

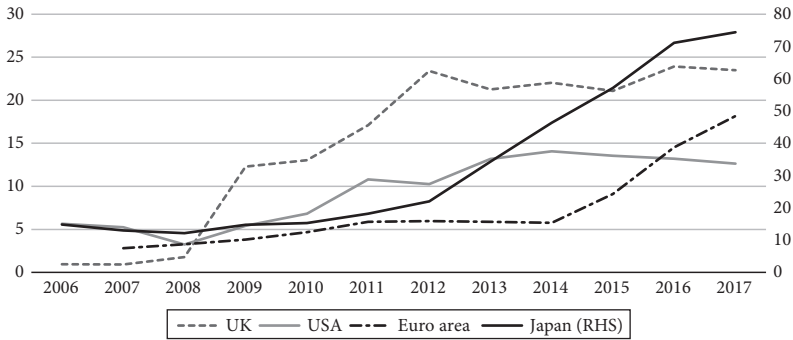


Figure 2.3 Central bank holdings of government debt, 2007–18 (% of GDP)

Source: IMF International Finance Statistics.

federal government debt only, the debts of state and local governments in the United States are excluded. In the UK, the headline debt measure is called Public Sector Net Debt,⁸ and extends beyond the general government to include the liabilities of public corporations and the Bank of England and includes some offsetting liquid assets. In Latin America, measures of public debt often extend to include the debts of some or all state-owned enterprises, and sometimes the Central Bank. In many low-income or developing economies countries, the focus is on debt measures that include both the formal government debt and explicit government guaranteed debt of non-government units (but leave out debt without an explicit guarantee).

There is arguably no single correct coverage of debt. Proponents of general government debt measures draw a line between the predominately tax financed nature of government, compared to the market revenues of government owned corporations. However, for many countries the presence of explicit or implicit government guarantees means that the debt of public owned corporations can be a significant course of fiscal risk, should these guarantees be called—for those who draw a line between the public sector and the private sector, the key metric is total public sector debt. However, for users of debt data it is important to understand what the coverage is, to what extent data has been consolidated by eliminating intra-public sector holdings, and what might be lurking outside the reporting perimeter.

⁸ During the global financial crisis, Public Sector Net Debt ballooned as the UK government nationalized several previously private large banking groups thus expanding debt. This prompted the UK authorities to create a new headline measure of debt, called “Public Sector Net Debt Ex” that excluded the temporary impacts of the financial crisis.

B. Valuation of debt

A second important factor in thinking about sovereign debt is the valuation of that debt, especially, but not only, in relation to government debt securities. Broadly speaking, debt can be valued in three main ways, but which valuation is used can have a significant impact on the value of debt stock.

For most countries, debt is valued at *face value*, or the value to be repaid at maturity. Some countries report debt at *nominal value*, defined as the principal sum borrowed plus interest accrued and not yet repaid. In National Accounts, the basic principle is to value debt at the *market value*—which is the value for which a bond will change hands in the secondary market (and which can be readily observed in the case of government bonds with well-developed capital markets, such as the bonds for most advanced economies. For debtors, the face and nominal values are critical, but for creditors, the market value of the bonds, which reflects the default risk is also important, as it reflects the likelihood of them receiving their money back.

At maturity of an instrument, all these valuation methods will arrive at the same ultimate point, but during the lifetime of the bond these different valuations can diverge significantly. In addition, valuation has a major impact depending on the nature of the bond that is issued.

Consider bonds issued at a discount, or even a deep discount. Examples of these include Treasury Bills, which typically have short-term maturities, but other longer term instruments issued at a discount are not unknown. These bonds may pay a small coupon, or no coupon at all. Instead investors pay a discounted amount at issuance, and then receive the face value of the instrument at maturity. The difference between the issue price and redemption amount is essentially equivalent to the interest. Now consider the difference between the face value and nominal value of such instruments. At issuance, the nominal value is lower than the face value, but over the life of the instrument, the nominal value increases as interest accrues before meeting face value at the time of maturity (Figure 2.4).

Depending on the local public debt law, and definitions in use for headline measures of debt, government debt management offices may have incentives to issue more, or less of, particular types of debt instrument. From an investor's perspective, as long as the government is deemed solvent, and as long as the eventual yield is satisfactory, because they will typically record the debt at nominal or market value in their financial statements, they will be indifferent to the types of instrument issued, but the ability of government debt managers to game the headline debt numbers through

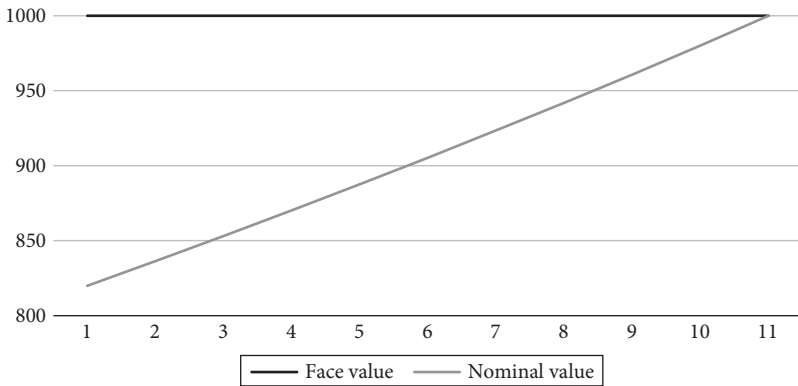


Figure 2.4 Face value vs. nominal value

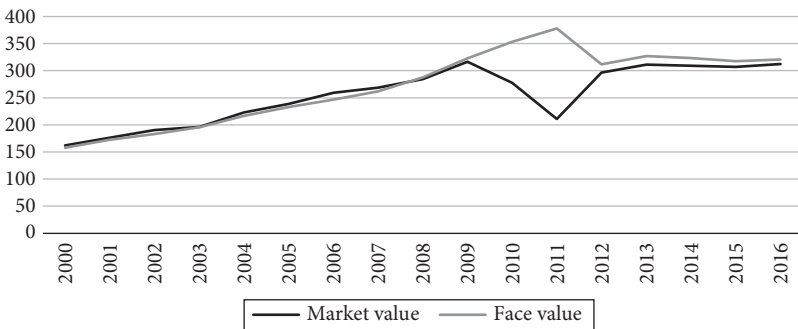


Figure 2.5 Greece central government debt securities, € billions

Source: IMF Government Finance Statistics.

issuance of different kinds of debt instruments that get recorded in different ways in official debt statistics, means users need to be aware of the basis of valuation of debt, and the types of debt being issued.

Notwithstanding the differences between face and nominal value because of differing instruments, differences between face or nominal and market value can emerge, either during periods of market panic (as investors fret that a government may default) or conversely during a flight to safety, when the price of government assets are bid upwards by investors seeking safe haven investments.

Figure 2.5 shows the first scenario, in relation to Greece. During the global financial crisis, and at the height of the Greek debt crisis in 2010 and 2011, the market price of Greek government debt securities plummeted, even as debt at face value continued to rise.

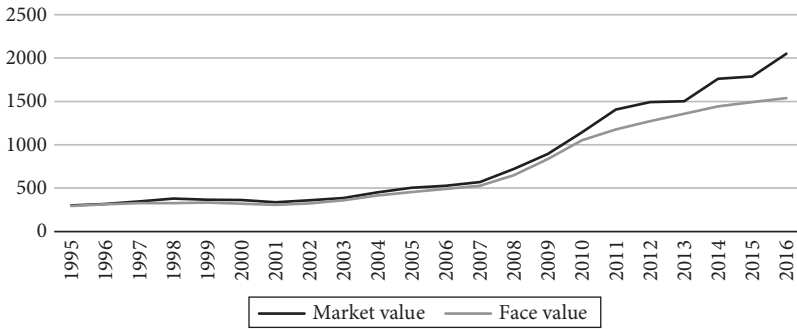


Figure 2.6 UK central government debt securities, £ billions

Source: IMF Government Finance Statistics.

Figure 2.6 shows the second scenario. Throughout the 1990s until the financial crisis, UK debt securities were little different at face and market value, but since the financial crisis a global shortage of safe assets, coupled with QE in the UK, has seen the market price for UK gilts increase, such that by the end of 2016 UK central government debt securities were worth considerably more at market value than at their face value. The same thing has happened in the United States.

Valuation is critically important to measures of sovereign debt, and users of debt data should aim to understand what valuation is being used, for which instruments and the extent to which a different valuation could provide different insights.

C. Instrument coverage of debt

Discussion of sovereign or government debt has typically focused on two main types of borrowing by governments: borrowings in the form of debt securities, such as US Treasuries, German Bunds, or UK Gilts, and borrowings in the form of loans, including loans from domestic and foreign commercial banks, and bilateral loans from foreign governments and their lending arms (such as development banks), as well as from international financial institutions such as the European Investment Bank, or World Bank.

Debt securities are the most common form of debt for most advanced and emerging market countries. Typically issued by public auction, a debt security is a promise to repay an amount at maturity, and will typically include a fixed interest rate, regular interest payments (coupons) and they come in many different varieties. Debt securities can be short-, medium-, or long-term

instruments (securities of under 1 year are typically referred to as Treasury Bills), can be issued at their face value (“at par”), for less than face value (“at a discount”), or for more than their face value (“at a premium”).⁹ Some instruments are index linked (either the coupon, the principal, or both) to the value of the Consumer Price Index, or other indices. Debt instruments can be issued in domestic or foreign currencies. Finally, debt securities can be issued to domestic creditors, or to external creditors, for example through the Eurobond market.

As we will discuss further below, the nature of bonds issued has an impact on the measurement of debt, depending on how debt is being valued. In addition, as discussed in Section 4, the maturity profile, currency of issuance, and residency of creditor can all have important implications.

While almost all countries can issue short-term securities in domestic markets, for many low-income countries, especially those with poorly developed or illiquid financial markets, or indeed no access to credit markets, debt securities are not a sufficient financing option. Instead for many low-income countries most of their debt is in the form of bilateral loans. These can be from domestic or foreign banks, or other financial institutions, but can also be highly concessional loans from bilateral or multilateral lenders. This difference between those more advanced or developed countries that mostly finance themselves with debt securities, versus the smaller or less developed countries that are more dependent on loan financing is shown in Figure 2.7.

The fundamental distinction between a debt security and a loan is that debt securities are designed to be tradable or *negotiable* whereas loans typically are not, so debt securities will often be redeemed by someone other than their original purchasers.

Government’s (and corporations) are also continually coming up with new schemes to deliver public policy that can have the effect of hiding debt off the balance sheet, and whether intentional or not, these schemes can massage the publicly available debt numbers. To take one well-known example, during the late 1980s, governments in the UK and United States began to develop a new model for the construction of public infrastructure, the public private partnership (PPP). Under this model a private sector partner builds an asset and leases the asset to the government over a long-term contract. The government gets the benefit of a new hospital, prison, or school, but the debt is legally incurred by the private partner and no debt appears on the government

⁹ Face value refers to the stated value of a bond stated by an issuer, for bonds this is the amount paid at maturity.

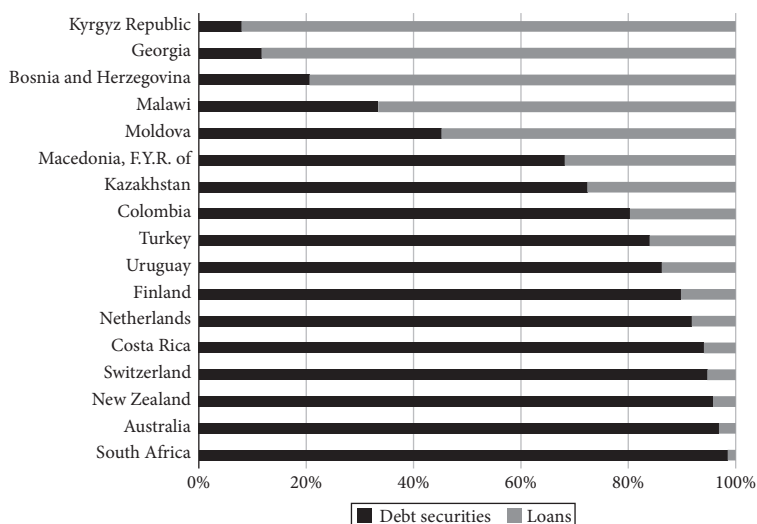


Figure 2.7 —Share of debt securities vs. loans selected countries—central government 2016

Source: IMF Government Finance Statistics

balance sheet. Today there are thousands of PPP style contracts across dozens of countries, which have funded billions of new infrastructure. New guidance has been developed, by the IMF, by Eurostat, by the International Public Sector Accounting Standards Board, and national authorities to provide guidance on whether to record these contracts as government liabilities, essentially as finance leases, and therefore a form of loan, but many countries do not follow these rules in their own debt statistics.

Some measures of debt also go beyond debt securities and loans. Maastricht Debt, the headline measure of government debt in the EU discussed earlier, includes not only debt securities and loans, but also government liabilities in the form of currency and deposits. The size of these liabilities varies across the EU, with currency and deposit liabilities of less than 0.5 percent of GDP in Belgium, Croatia, Hungary, Netherlands, Poland, Slovenia, Slovakia, and Finland, to countries which have significant general government currency and deposit liabilities including Ireland (2017—8.4 percent of GDP), UK (9.7 percent), Italy (14 percent), and Portugal (16.3 percent). Where measures of sovereign debt extend beyond the general government to include the wider public sector, including public sector banks or the Central Bank, the inclusion or not of currency and deposit liabilities can have a material impact on headline debt numbers (see Case Study 2.2).

Case Study 2.2 Currency in circulation and Central Bank reserve liabilities—debt or non-debt?

A significant form of balance sheet liability in most countries is the Monetary Base, comprised of currency in circulation (notes and coins) and central bank reserve liabilities, but is this really debt?

To the extent that debt is only compiled for general government, and excludes the Central Bank, this question can be sidestepped. But if you are compiling public sector debt, as is the case in several countries, then this is a valid question.

The treatment of notes and coins as a liability and as a debt of the issuer is arguably a legacy of the gold standard, when notes and coins were convertible to gold. But in today's fiat currency world, this is obviously no longer the case, and there is a good argument for treating notes and coins like gold—as a financial asset with no matching liability.

Whether currency in circulation is debt matters, clearly, but it would be less of an issue if all countries had similar amounts of currency in circulation. In reality it varies considerably in size. At one extreme are cash reliant countries with poorly developed banking systems, such as Afghanistan, Algeria, or the Kyrgyz Republic, with currency in circulation of 16, 24, or 19 percent of GDP respectively. At the other extreme are advanced economies with highly developed cashless economies, such as Denmark or Sweden, where the currency in circulation is just 3.3 or 1.3 percent of GDP respectively. But there are exceptions to this general rule, such as Japan. Japan has currency in circulation of over 20 percent of GDP. This is not due to a lack of development of Japan's banking system, but cultural factors including low crime rates, high levels of trust, and a long-standing preference for cash (Figure 2.8).

Central Bank reserve liabilities, the other major component of the Monetary Base, raise similar questions about whether they are really debt, especially in those countries with actual or de facto reserve requirements. While these appear on the Central Bank balance sheet as currency and deposit liabilities, and therefore would appear in a broadly defined measure of public sector debt, they are not the same as debt securities or loans, and again, vary significantly in size. Whereas the average central bank reserve liabilities are around 10 per cent of GDP, in some countries they are considerably higher, at 46 percent of GDP in the Czech Republic, and 67 percent in Japan (Figure 2.9).

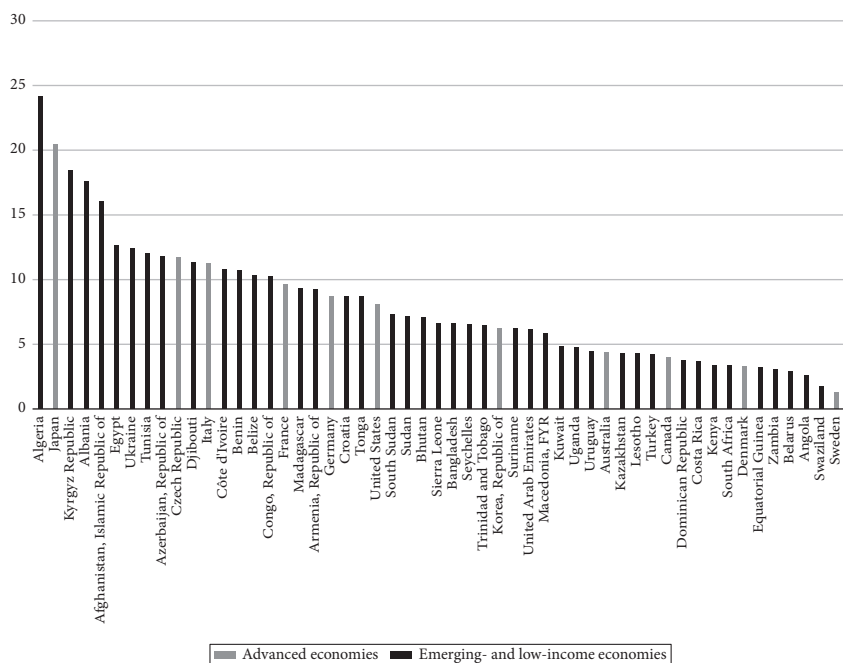


Figure 2.8 Currency in Circulation end-2017 % of GDP

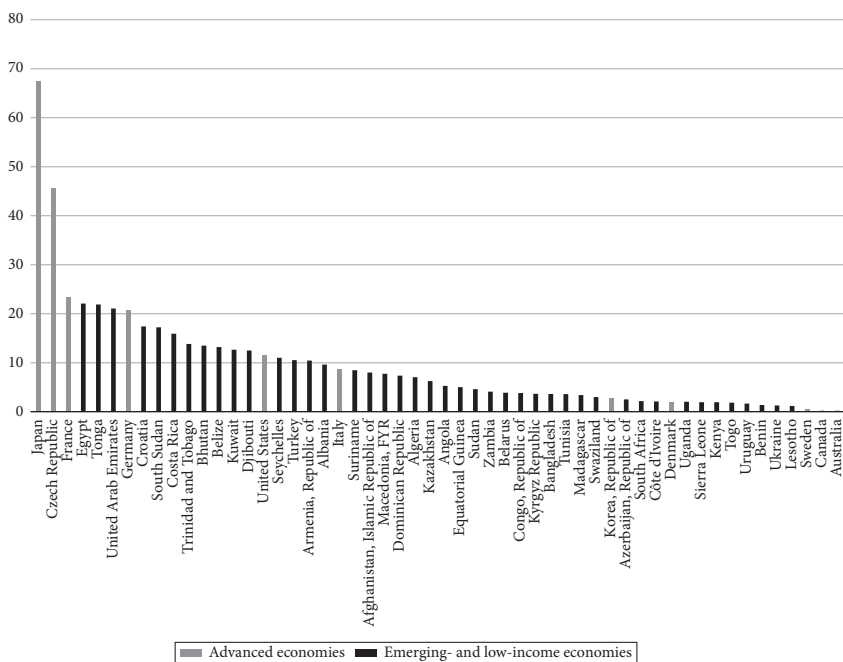


Figure 2.9 Central Bank Reserve Liabilities 2017 % of GDP

Continued

Case Study 2.2 *Continued*

Finally, the question of whether central bank reserve liabilities are debt or not raises questions about the impact on debt of Quantitative Easing (QE). Over the last decade, since the financial crisis, Central Banks in Japan, the UK, and the United States have acquired significant holdings of their own government bonds. While this has not reduced government debt, the composition of public sector debt has changed, reducing the amount of debt in the form of debt securities to a much higher proportion of central bank reserve liabilities. As a result, if you were to use a broad sectoral coverage of debt that included both the government and the central bank, but a narrow instrument coverage of debt (just debt securities and loans), then QE would have resulted in a lowering of public sector debt. Using a narrower sectoral coverage, or broader instrument coverage would mean QE had no impact. Again, this demonstrates how much these factors matter to our understanding of sovereign debt.

Although the traditional focus for sovereign debt is on debt securities, loans, and in some cases currency and deposits, the accounting and statistical communities recognize that a government can incur additional liabilities, such that focusing just on debt securities and loans could mean missing considerable government liabilities (Figure 2.10).

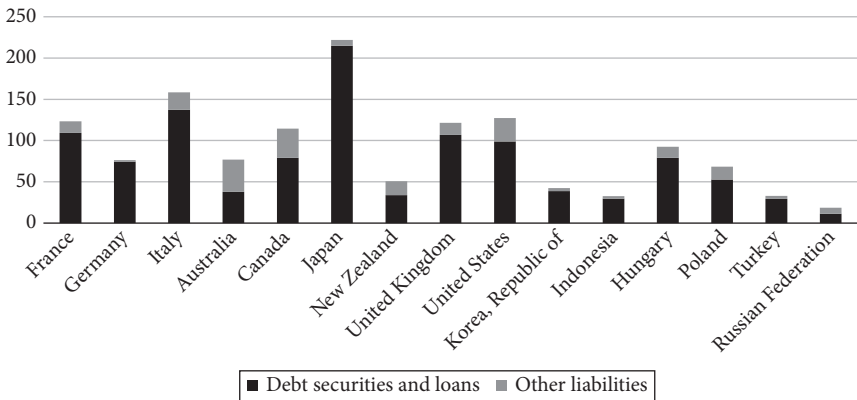


Figure 2.10 Debt Securities and Loans vs Other Liabilities (2016) % of GDP

Examples of other liabilities, for government and the wider public sector include accounts payable, financial derivatives, and, in many countries, pensions. These wider liabilities are captured in more comprehensive measures of the government or public sector balance sheet, discussed in Section 3.

3. Beyond debt: non-debt, contingent liabilities and public sector assets

Sovereign liabilities extend beyond the standard measures of sovereign debt discussed in the Section 2, further complicating the picture. This section aims to shed light on the main liabilities beyond debt. Specifically, it will discuss non-debt liabilities and contingent liabilities and liabilities in the SOE sector, outside the perimeter of general government. To capture all these liabilities, independent on whether they are recorded inside or outside of general government, we take the entire public sector as the point of departure.

This section further broadens the scope of analysis to include public sector assets, focusing on the public sector balance sheet. Discussions of sovereign liabilities focus on an important part of the government balance sheet, but this is only part of the story of a government's financial health. Financial statements for a multinational enterprise or other large company will typically include not just information on debt, but also the company's assets. In fact, its entire balance sheet, as well as an income statement, cash flow statement, statement of changes in equity, and extensive notes to the accounts with disclosures on material risks, including contingent liabilities, are normally published. Similarly, the Public Sector Balance Sheet (PSBS) brings together all the accumulated assets and liabilities that the government controls. It extends the perimeter of coverage from the general government to the entire public sector, bringing in nonfinancial and financial public corporations, including the central bank. As such, it presents the broadest possible picture of the health of public finances. Compiling this data through time provides clarity on trends and aids analysis and understanding.

A. Non-debt liabilities

Besides traditional debt liabilities (debt securities and loans), government or public sector liabilities also include other “non-debt” liabilities. These consist mainly of other accounts payable, financial derivatives, or, most significantly,

pensions. In short, narrowly focused debt statistics that only include traditional debt securities and loans may not tell the full story of government debt. Considering these liabilities other than debt securities and loans reveals a more comprehensive coverage of what governments or the public sector ultimately owe.

Currency and deposits are an integral part of the PSBS. These include the deposits held in public sector banks, reserves held with the Central Bank, and currency issued by the bank. In some cases, government itself has currency and deposit liabilities, for example when state-owned enterprises deposit their own funds in the government's single treasury account. The European Union's Maastricht Debt includes liabilities in the form of debt securities, loans *and currency and deposits*, and while currency and deposits are small in most EU member states, in 2016 they were much more significant in Ireland (8 percent of GDP), Italy (14 percent), Portugal (15 percent), and the UK (9 percent).

The public sector also carries amounts of accounts payable, short-term obligations to pay suppliers or other creditors. When expenditure is recorded on an accrual basis, any expenditures recorded where payments have not yet been made are recorded as giving rise to an account payable on the government balance sheet. These vary significantly in size, at the general government level from 3 percent of GDP in Latvia, to double digit amounts in France (12 percent) or Canada (18 percent). For countries that record their government spending on a cash basis, not recording accounts payables in the stock of debt enables them to run up, but not reveal, mounting domestic arrears on these payables, that would be recorded as expenditures and liabilities in accounts payable under accrual based accounting, that most governments require their private sectors to produce.

Pension liabilities can be as large or larger than traditional concepts of sovereign debt. And pension obligations are often—at least in part—enforceable, making these obligations very similar to debt, even though they are not considered as such in most countries. Public sector pension obligations can be related to unfunded pensions schemes managed by the government or to shortfalls for funded schemes for public sector employees. These liabilities, which may be difficult to measure, can be very large. At the end of 2015, Belgium estimates that employment related pension liabilities for only government employees stood at €181 billion, or 44 percent of GDP.

In addition, under most international statistical and accounting rules, the public sector balance sheet does not even include liabilities of social security, state, or national pensions that apply to the whole population and which are funded on a pay-as-you-go basis or out of general taxation. This is because

such social security schemes are not deemed a contractual obligation by statistical and accounting guidance and can often be changed or amended by the government. However, for many households there are strong expectations that these will be paid, especially those households already in retirement. In 2015 Germany estimated that liabilities of its social security schemes totaled some €6.8 trillion, or around 226 percent of GDP. Figure 2.11 shows the value of accrued to date liabilities of unfunded, employment-related pensions and social security pensions in eight EU member states, at the end of 2015. These types of figures, if included inside gross debt, would dramatically change perceptions of gross debt for these countries, anchored as they are by the Maastricht Debt threshold of 60 percent of GDP.

Valuation matters with pension liabilities as much, if not more, than with debt liabilities. Pension liabilities, whether employment-related pensions on the government balance sheet or social security obligations disclosed elsewhere, are difficult to value. They are conventionally valued by actuaries as the discounted value of future pension payments. This means bringing together real information on the participants in a pension scheme, with assumptions about future mortality rates, wage growth, and a discount rate. Small changes in these assumptions, especially the discount rate, can have significant impact on the resulting liabilities.¹⁰

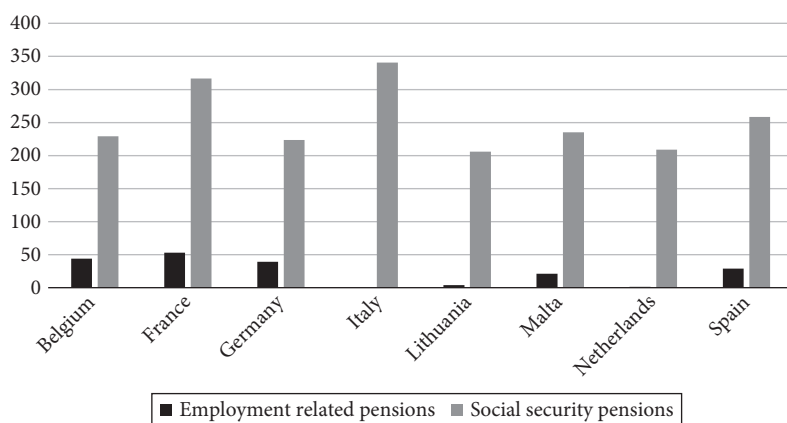


Figure 2.11 Accrued to date liabilities—government unfunded employment-related and social security pensions (2015) % of GDP

Source: Eurostat.

¹⁰ EU countries are required to compile estimates for accrued to date liabilities of their various national pension systems, using a unified and consistent set of assumptions including a discount rate of 5 per cent. However, countries are also asked to conduct sensitivity analysis, calculating the

Leaving pensions off the balance sheet, or treating them as contingent liabilities, does not prevent pension chickens coming home to roost. In Brazil, pensions are widely considered to be an explosive and possibly unsustainable government liability. General government expenditure on social benefits, including pensions, have gone from 10.2 percent of GDP in 2006 to 17.6 percent of GDP in 2017 and are projected to continue climbing absent reforms of the pension system. The traditional focus on debt and the primary balance revolves around concerns of the amount of expenditure on interest and crowding out of other spending. In Brazil the costs of servicing this different kind of liability, the pension liability, is a major source of fiscal concern. Brazil faces a further problem when dealing with this issue, which is that pensions can only be modified with a constitutional amendment.

Other countries have recognized the issues posed by their pension systems, and engaged in pension reform. In some cases, when countries reform their pension systems, the reforms can turn the unfunded obligations of a pension system into something that looks a lot like traditional government debt liabilities. The best example of this is from Chile in the early 1980s. Faced with an increasingly underfunded social security system, the Chilean government moved to a system of individual pension savings accounts, but to reflect rights built up under the old system, retirees were able to claim so called “recognition bonds” that make explicit the debt owed to workers who had contributed to the old pension system. While not included in headline debt figures, information on recognition bonds is included in Chile’s Reports on Public Debt Statistics.¹¹ Chile’s stock of recognition bonds was 37.9 percent of GDP in 1982. Recognition bonds fell to below 10 percent of GDP in 2006 and are now just 0.8 percent of GDP at September 2018.

Finally, some governments also manage their debt using a final type of instrument, a financial derivative. While not common, and not a large part of debt, some government debt management offices use hedging instruments to manage exchange rate or interest rate risk. But while the use of derivatives may be limited, depending on the type of derivatives issued, they may contain considerable fiscal risk.

liabilities using a 4 and 6 percent discount rate. The impact is significant. In Ireland, as an example, using a 5 percent discount rate, government employment related pensions and social security schemes liabilities at the end of 2015 stood at €345 bn (132 per cent of GDP). Using a 6 percent discount rate, liabilities fall to €284 bn (108 per cent of GDP). By contrast using a 4 per cent discount rate would see liabilities rise to €424 billion, (162 per cent of GDP).

¹¹ <http://www.hacienda.cl/english/public-debt-office/statistics/public-debt.html>

B. Contingent liabilities

Some sovereign debt definitions also include contingent liabilities, such as publicly guaranteed debt. Contingent liabilities are a possible obligation depending on whether some uncertain future event occurs.

The balance sheet approach can also help to bring out contingent liabilities. Extending coverage to the public sector brings contingent liabilities from public corporations into the balance sheet. However, a range of other contingent liabilities remain outside. These include explicit government guarantees or other contingent risks from the private financial sector (such as guarantees of the deposit protection schemes or implicit guarantees for “too big to fail institutions”), PPPs, natural disasters, and legal risks. The potential impact from these contingent liabilities on public finances can be informed by other assessments, such as FSAPs, fiscal transparency evaluations, and countries’ fiscal risk statements. Bringing out these risks of the realization of contingent liabilities on public finances can provide guidance on the size of buffers that may be needed to avoid pro-cyclical policy adjustments during a crisis, the channels through which fiscal risks propagate, and where risk management efforts should be directed (IMF 2016a).

Contingent liabilities can be large and consequential but may be hard to quantify precisely *ex ante* (see Case Study 2.3). In some cases, the government’s

Case Study 2.3 How contingent liabilities gave the Celtic Tiger a heart attack

At the start of the 1990s, Ireland was a poor country by West European standards, with high poverty, unemployment, inflation, and low growth.¹ Then, something dramatic happened starting in the mid-1990s. Between 1995 and 2000 the Irish economy expanded at an average rate of 9.4 percent and continued to grow at an average rate of 6 percent until 2007 earning the country the nickname the “Celtic Tiger.” In 2008, the Tiger had a massive heart attack.

Starting in 2008, Ireland had to contend with an interlocking sovereign–banking–real economy crisis. After facing heavy losses on property-related

¹ This description of the Irish case is based on IMF reports. It borrows heavily from the 2012 Article IV report (IMF 2012). Other key sources included Ireland’s Fiscal Transparency Assessment (IMF 2013) and IEO (2016).

Continued

Case Study 2.3 *Continued*

assets in the spring of 2008, Irish banks suffered a run on wholesale funding in the Fall—prompting massive recourse to Eurosystem liquidity support.

In response, the government issued a blanket guarantee from September 2008, transferred large distressed property development and commercial real estate assets from banks to the National Asset Management Agency (NAMA) from April 2009, and provided large scale support for two failed banks (Anglo Irish and Irish Nationwide Building Society), and large equity injections in other banks (IMF 2012).

The materialization of these contingent liabilities together with a full-fledged economic bust ultimately led the authorities to request a bailout. A steep decline in construction activity drove the country into recession from 2008 with the sharp world trade contraction in 2009 adding to the shock to Ireland's highly open economy. The fiscal deficits ballooned, and public debt shot up from 25 percent of GDP in 2007 to over 90 percent by 2010 (IMF 2012). Confidence in the country's fiscal position crumbled, primarily because of the close sovereign–bank interlinkages. Deepening uncertainty about the ultimate scale of the banking sector losses, and hence growing doubts about public debt sustainability, drove a brutal switch in market sentiment in the Fall of 2010, cutting the sovereign off from market financing. In December 2010, the Irish government requested EU and IMF financial support. The total financing package of euro 85 billion (about US\$113 billion at the time) was provided jointly by the EU Financial Stabilization Mechanism/European Financial Stability Facility, bilateral partners, the IMF, and the government's own resources. With an estimated fiscal cost of some 40 percent of GDP, Laeven and Valencia (2012) consider Ireland's banking crisis the second costliest in advanced economies since at least the Great Depression.

exposure to contingent liabilities can be quantified.¹² In others, quantification may be hard (open-ended schemes) or best not be published, in order not to affect the government's negotiation position. The IMF Fiscal Transparency

¹² See, e.g., Igan et al. (2019) or Laeven and Valencia (2008, 2013, 2018) for ex-post quantifications of public interventions in the financial sector during and after the global financial crisis.

Code recommends governments analyze and disclose potential risks through Fiscal Risk Statements (see Annex 2.B) or similar publications.

In addition to explicit contingent liabilities, there are often implicit liabilities, such as political or public pressure to stand behind certain institutions, even for liabilities that are not explicitly guaranteed. In the United States, although there were many explicit statements to the effect that the debt of Fannie Mae and Freddie Mac were not guaranteed by the US Federal Government, prior to the crisis these two mammoth government sponsored entities were issuing AAA rated mortgage backed debt securities (backed by increasingly risky underlying loans), despite being considerably riskier propositions than the US Government and at the height of the financial crisis these two units, both far too big to fail, were ultimately rescued by being placed into “conservatorship” by the US Treasury.

C. Public assets, net debt, and net worth

In 2016, Norway’s general government debt was 36 percent of GDP, low compared to many other advanced economies. However, Norway’s net debt was –85 percent of GDP, meaning Norway didn’t have net debt, but instead it had net assets of 85 percent of GDP. In fact, Norway’s financial situation is rosier still, Norway’s net financial worth (all financial assets minus all liabilities) is 290 percent, and Norway’s net worth (including all nonfinancial assets) is over 350 percent of GDP. While Norway is an outlier, the traditional focus on government liabilities is nowhere near the whole story of a government’s financial position.

An assessment of public wealth and the health of public finances should look beyond debt. To be comprehensive, it should incorporate government assets and non-debt liabilities, as well as assets and liabilities of the broader public sector outside of general government. This section will focus on these elements of the public sector balance sheet.

Economist Paul Krugman often compares the US Federal Government to an insurance corporation with an army; leaving aside the military, any analysis of an insurance corporation needs to understand not just the liabilities it has incurred, but also the assets it has amassed to meet any claims. Consequently, to fully understand a government’s financial position one should look at *its* entire balance sheet, much like one would look at a corporation’s balance sheet to assess its financial position. Looking beyond sovereign debt at a country’s PSBS brings out government assets and non-debt liabilities, as well as the

assets and liabilities of public corporations.¹³ This strengthens fiscal analysis, showing the full scale of assets and liabilities that the government controls. Moreover, in many countries public corporations represent a significant source of fiscal risk, either through explicit or implicit guarantees, or, in some cases, a direct draw on the public purse (Bova et al. 2016).

These items are material, with public sector assets comprising US\$101 trillion or 219 percent of GDP in a sample of thirty-one countries covering over 60 percent of world GDP (Figure 2.12). The PSBS also provides a complete picture of liabilities, illustrating that general government debt comprises 94 percent of GDP. But that is only half of the total public sector liabilities of 198 percent of GDP. Assets include financial assets and nonfinancial assets. Public corporations include both financial and nonfinancial corporations, with the Central Bank included in the former.

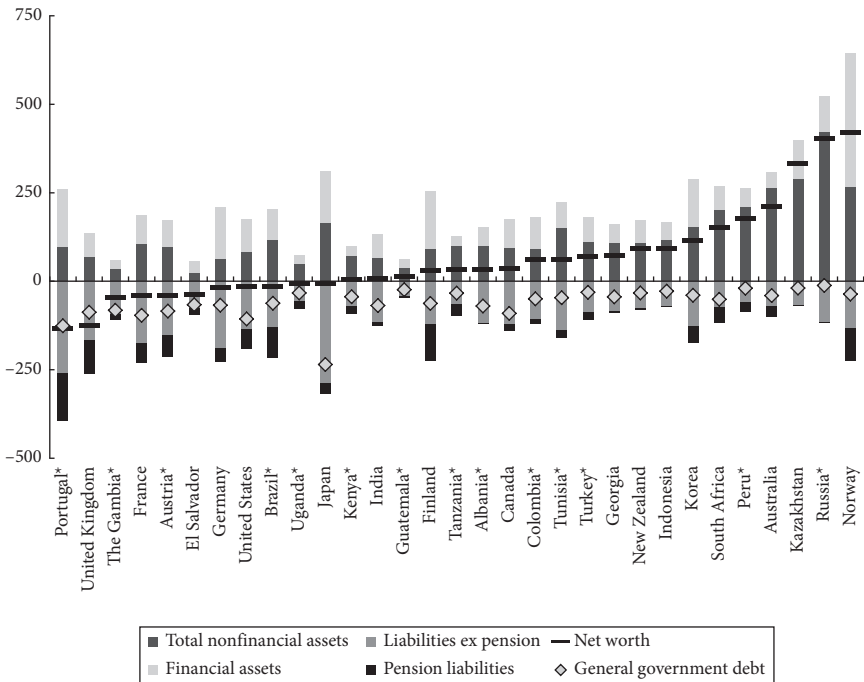


Figure 2.12 Public sector balance sheets, 2016 (% of GDP)

Source: IMF staff estimates.

*Based on a single year of data, in most cases compiled as part of the Fiscal Transparency Evaluation: Albania, 2013; Austria, 2015; Brazil, 2014; Colombia, 2016; The Gambia, 2016; Guatemala, 2014; Kenya, 2013; Peru, 2013; Portugal, 2012; Tanzania, 2014; Tunisia, 2013; Turkey, 2013; Uganda, 2015.

¹³ The equity value of public corporations is included within general government accounts, as part of financial assets. Thus, the inclusion of public corporations within the public sector has no impact on net worth.

Elements of the PSBS

Financial assets typically include cash deposits, government loans to other sectors, as well as equity in public and private corporations, as well as debt security holdings of pension and sovereign wealth funds. These assets may be marketable and relatively liquid (particularly if they are listed and traded in deep markets), but they may also be hard to value (such as equity in state-owned enterprises) or hard for the government to monetize (if the assets are explicitly tied to pension, social security, or other obligations, or held by subnational government units they may not be available to finance other funding needs). Some financial assets can be relatively volatile, due to substantial revaluations as asset prices fluctuate.

Non-financial assets typically include buildings, infrastructure, land, and natural resources. Many of these comprise the public capital stock and play an integral role in delivering economic and social outcomes. Existing government data are often missing or poorly reported, with serious valuation issues (Bova et al. 2013). For commodity producers, natural resources can represent the largest asset on the state’s balance sheet (see Figure 2.13).

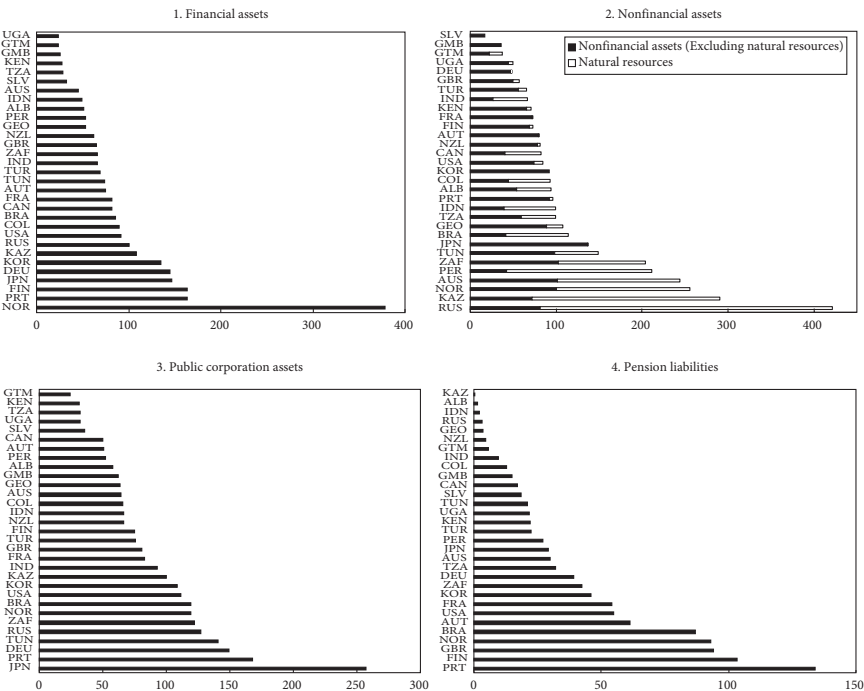


Figure 2.13 Additional elements of the public sector balance sheet (% of GDP)
Source: IMF 2018 as in original chart

Including natural resource assets introduces a greater rigor to the management of the public's wealth. In standard fiscal analysis, sales from natural resource extraction are treated as a revenue, increasing the net worth position of the state. The balance sheet approach instead recognizes them as an asset, which once extracted and sold represents a conversion of one asset (resources) for another (cash). Apart from extraction costs, this conversion is net worth-neutral. The ultimate impact on public wealth is then determined by what the government does with the cash receipts. If revenues from sales of natural resources are used to fund ongoing expenditure, net worth decreases, whereas if they are used to purchase other assets (financial or non-financial), net worth remains broadly unchanged. Estimates used here for the stock of mineral and energy resources correspond to the net present value of the expected pre-tax cash flows resulting from their commercial exploitation.

Consolidation

Extending the perimeter of the balance sheet to the public sector requires a consolidation of cross holdings of assets and liabilities by different public sector entities.¹⁴ These are country specific, but the largest cross holdings are typically government deposits at the central bank, financial corporations' holdings of government securities, the government's equity stake in public corporations, and loans between public corporations. Consolidations can be large, and potentially alter the fiscal picture. For example, in Japan, while gross outstanding public sector debt securities and loans were worth 288 percent of GDP in 2017, the majority of this is held by other public sector units, leaving 138 percent of GDP in the hands of private creditors (Figure 2.14). The same is true in the United States, to a lesser extent, where the equivalent figures are 164 and 110 percent of GDP.¹⁵ These cross holdings can be a channel through which fiscal risks spread. For instance, during downturns or crises, public corporations often build up large arrears to each other, leaving a trail of unpaid bills across the sector and clogging up balance sheets. Japan presents an interesting example of intra-public sector links that triggered a policy response. Until the year 2000, the Postal bank was required to lend its deposits to the Fiscal Loan Fund (Figure 2.14, bottom). Partly as a result, the Postal bank experienced losses when interest rates declined in the mid-1990s, due to a mismatch

¹⁴ Consolidation refers to the removal of intra-public sector claims. Consolidated public sector liabilities thus represents the total amount of liabilities the public sector is standing behind, when all cross holdings have been netted out.

¹⁵ In the United States, treasury holdings by the social security fund are consolidated within the general government and hence do not show in these numbers.

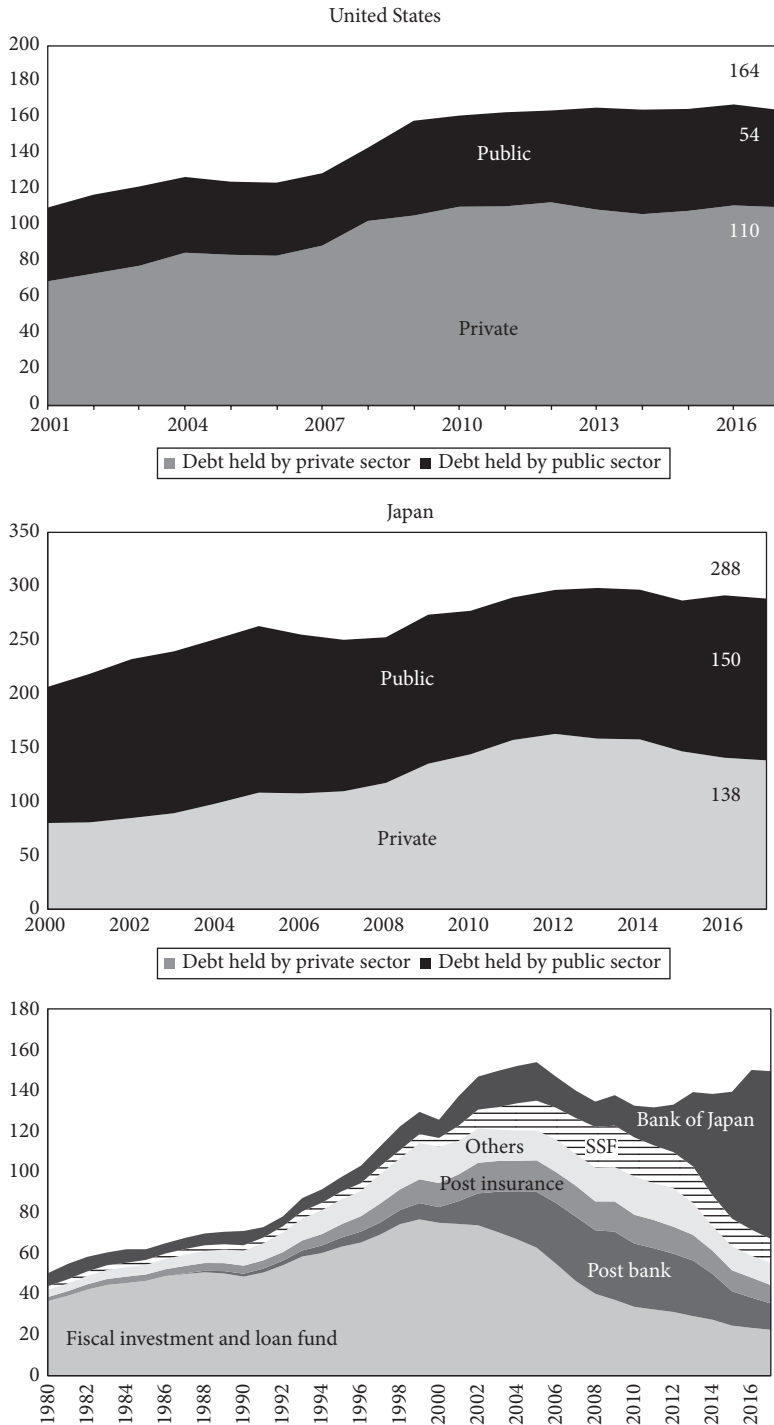


Figure 2.14 Government debt held by public and private sector (% of GDP)

between its long-dated liabilities and shorter-dated assets. Meanwhile, the Fiscal Loan Fund realized offsetting profits. While on net these profits and losses hence cancelled out across the public sector, concerns over Postal bank's losses triggered a reform of the system (Koshima 2019).

Valuation

As with the valuation of debt and pensions, the valuation of assets matters, and is not straightforward. Valuation can be a challenge, particularly for non-financial assets that are rarely traded, and with differing approaches taken for different components of the balance sheet across countries—in part due to differences in accounting standards. Asset valuations are also more volatile than debt and can be highly correlated with the economic cycle—meaning their values can be at their nadir when financing needs are most pressing.

Liquidity

In addition, many assets are illiquid or not marketable, and would not be available to meet rollover or deficit financing needs in the short term. Financial assets are mostly marketable and relatively liquid, except for direct loans and non-listed equity holdings in public corporations, which may also be less reliably valued. However, some financial assets may be explicitly tied to pension or social security obligations and may not be available to finance other funding needs. Nonfinancial assets include buildings, infrastructure, and land. They are often illiquid and non-marketable, or only marketable over the medium to long-run (e.g., privatizations).

Public wealth

Taking assets on board creates a comprehensive view of public wealth. The main indicators used to bring this out are net debt, net worth, and net financial worth:¹⁶

- *Net worth*, the headline measure of government wealth. It is calculated as total assets minus total liabilities. Net worth suffers from the various valuation issues that accompany the constituent parts of the balance sheet, particularly from nonfinancial assets. Furthermore, it makes no distinction between assets that can be sold to meet financing needs, and assets that are not marketable.

¹⁶ Besides net (financial) worth, a range of other indicators provide important information on the state and resilience of public wealth. These include the standard measure of gross debt, as well as measures that explore mismatch risks and degree of hedging present in the balance sheet.

- *Net financial worth*, a measure of financial wealth, calculated as total financial assets less liabilities. In general, financial assets and liabilities are more reliably valued, and more readily marketable than nonfinancial assets.
- *Net debt*, a narrow measure of wealth, calculated as debt liabilities (most commonly debt securities, loans, and currency and deposits), minus corresponding financial assets. This definition leaves out hard to value assets, such as government equity holdings in state-owned enterprises.

The evolution of net worth presents a somewhat different picture from the more standard evolution of debt. A decomposition of post-crisis developments in a selected sample of countries shows the relative importance of debt accumulation, public investment, operations in the public corporation sector, and valuation changes (Figure 2.15). It shows that while deficits and debt accumulation drove the post-crisis deterioration in solvency, balance sheet effects significantly cushioned the decline in net worth. Specifically, among these countries, net worth has declined by some 25 percentage points of GDP since the crisis. Fiscal deficits are by far the largest component of this decline, contributing 38 percentage points of GDP to the overall decline. Together with the 9 percent of GDP denominator effect this bring net worth

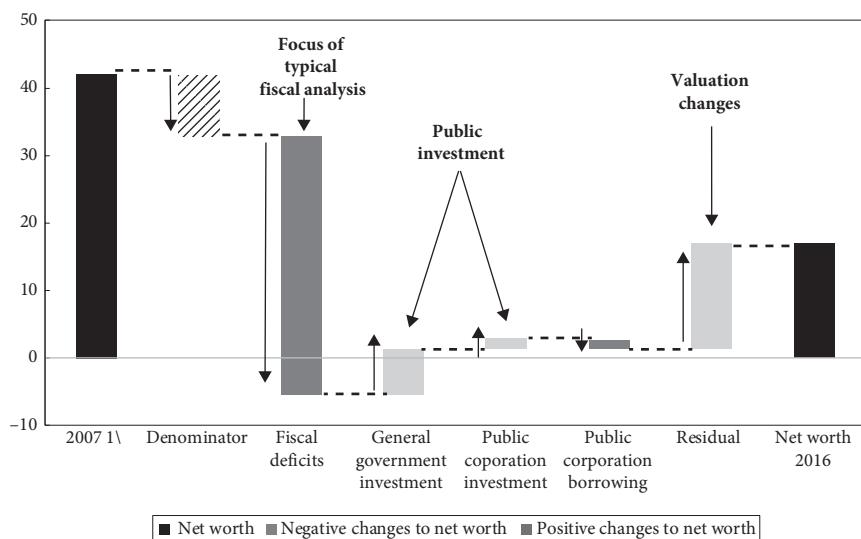


Figure 2.15 A decomposition of changes in net worth, weighted average of 17 countries, (% of GDP). 1\Expressed as % of 2007 GDP.

Source: IMF (2018)

down into negative territory.¹⁷ However, some of the deficits were used to invest rather than consume, raising net worth by some 8 percentage points of GDP. While valuation fell during the crisis, reflecting falling asset prices, they rebounded in subsequent years, adding another 16 percentage points of GDP to net worth. Hence, overall the decline in net worth has been far smaller than the cumulative deficits alone would suggest.

Overall, the public sector balance sheet complements the picture presented by government debt. It provides the most comprehensive view of public wealth. By broadening the focus, it sheds light on the assets governments control, as well as liabilities that receive scant attention in standard analysis. It thus complements data and analysis based purely on debt, and this way can enrich fiscal analysis as well as the policy debate.

4. Sovereign debt composition

A. Supply (issuance of sovereign debt)

Analysis of government or sovereign debt does not only focus on the total stock of gross or net debt. The characteristics of debt also matter enormously to whether a country has a debt problem or not. Analysis, therefore, will often look at the type of debt instruments (bonds versus loans), currency of issuance, the maturity profile, and the jurisdiction of debt issuance. Accordingly, this section discusses the typical structure of debt for advanced economies, emerging markets, and developing economies from a cross-country perspective. The discussion highlights important differences across income groups and countries in the composition of the debt they have issued.

Debt by instrument

As discussed in earlier, government debt typically consists of two main types of borrowing: borrowings in the form of debt securities and loans. While debt securities are the most common form of debt for advanced and some emerging market countries, loans are still the main form of borrowing for most developing economies (Figure 2.16).

¹⁷ This denominator effect displays the impact of moving from 2007 to 2016 GDP in the denominator. The 2007 bar is expressed in percent of 2007 GDP, while all other bars are expressed in percent of 2016 GDP.

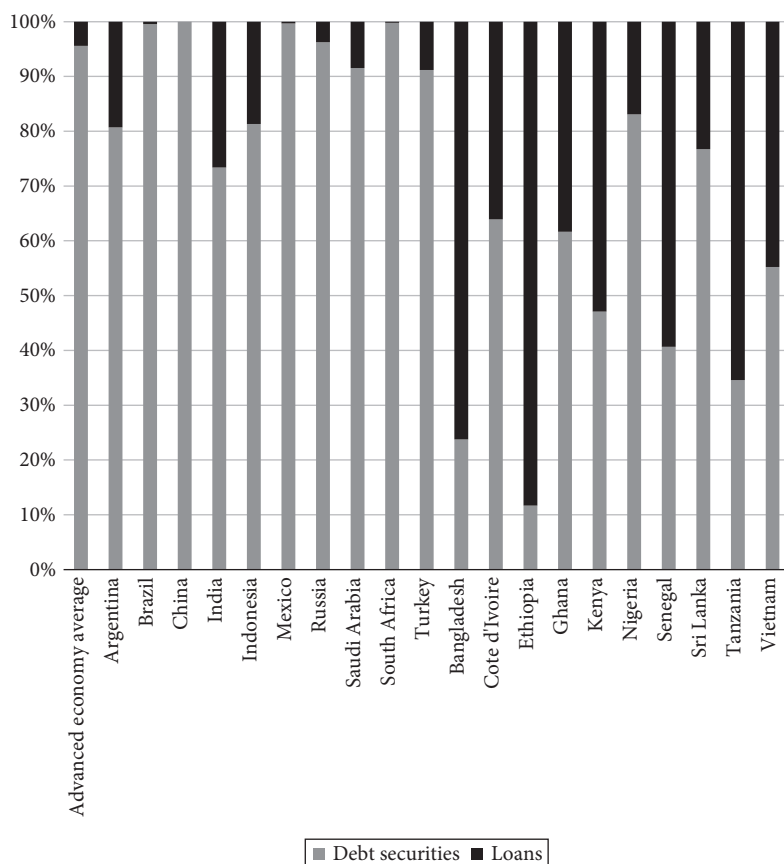


Figure 2.16 Composition of central government debt by instrument, end-2017

Note: Data for China and Nigeria are as of 2017Q2 and 2017Q1, respectively. Data for Saudi Arabia is for budgetary central government only

Sources: IMF/World Bank Quarterly Public Sector Debt (QPSD) database; national sources.

Debt by currency

Currency of issuance is another important dimension in debt structure. While large advanced economies almost exclusively issue debt in their own currencies, emerging markets, and to a larger extent developing economies, also borrow in foreign currencies (Figure 2.17). The borrowing is typically in US dollars, but are also in Japanese yen, euro, UK sterling or Swiss francs. While Argentina, Indonesia, Mexico, Saudi Arabia, and Turkey still have substantial government debts in foreign currencies (Figure 2.17), most emerging market economies have traditionally moved away from foreign to local currencies in recent years. By borrowing in foreign currencies countries may be

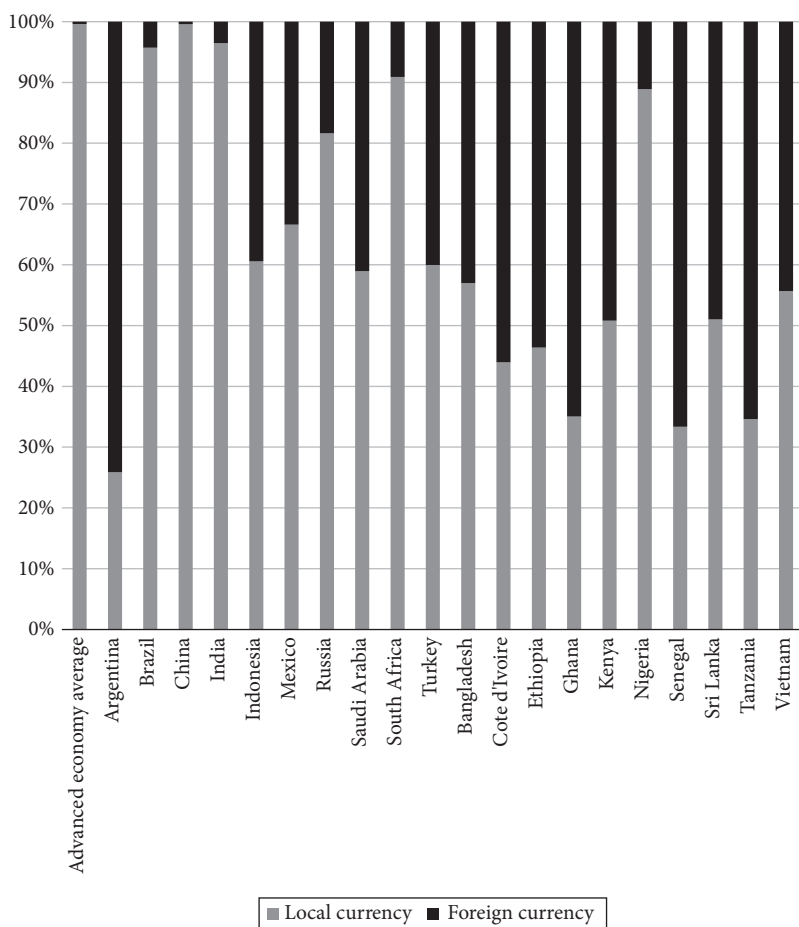


Figure 2.17 Composition of government debt by currency, end-2017

Note: Data for Nigeria are as of end-2016.

Sources: IMF DSA databases.

able to access deeper capital markets or borrow at lower headline interest rates but this exposes the borrower to what can be significant exchange rate risks.

Debt by maturity

Maturity profile is another important consideration. As discussed earlier, countries issue a mixture of short- and long-term debt, but the longer the maturity, the fewer short-term refinancing or rollover risks exist. As Figure 2.18 shows, today, most countries issue debt at longer-term maturities (i.e., greater than one year) to avoid short-term rollover risks. The share of short-term debt is typically no more than 10–20 percent for total government debt

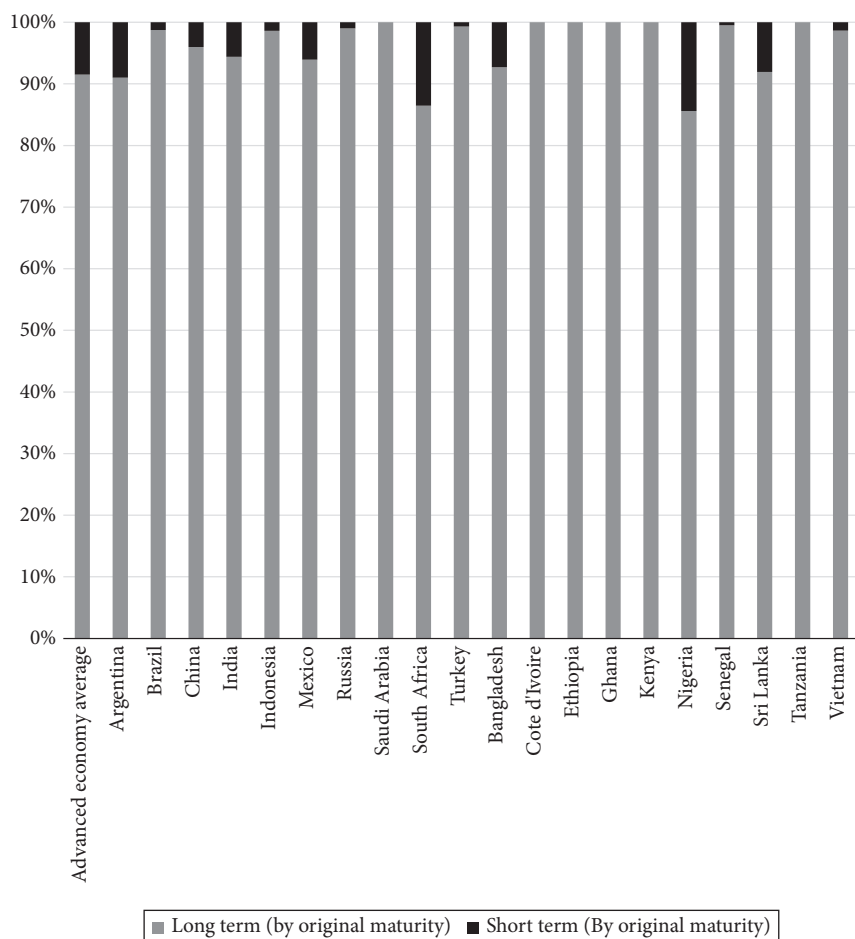


Figure 2.18 Composition of government debt by maturity, end-2017

Note: Data for Nigeria are as of end-2016.

Sources: IMF DSA databases.

outstanding (Figure 2.18). Countries where central banks issue their own debt securities do not need to rely on Treasury Bills for open market operations, but most central banks make use of Treasury Bills to manage liquidity and this creates a structural reason for more short-term government debt (Nyawata 2012).

Debt by jurisdiction of issuance

The jurisdiction of the debt has also major implications. Most advanced economies issue debt securities under their own domestic law but many emerging market and developing economies take advantage of international capital

markets and issue in the UK or United States under English or New York law. Examples include Argentina, Indonesia, Saudi Arabia, and Turkey among emerging markets and Cote d'Ivoire, Ghana, and Senegal among developing markets (Figure 2.19). While this typically involves a lower interest rate and access to a larger investor base, the sovereign submits to a foreign law and jurisdiction which may expose the sovereign to litigation risk. For the investors such submission to foreign law and jurisdiction results in larger protection and more predictability.

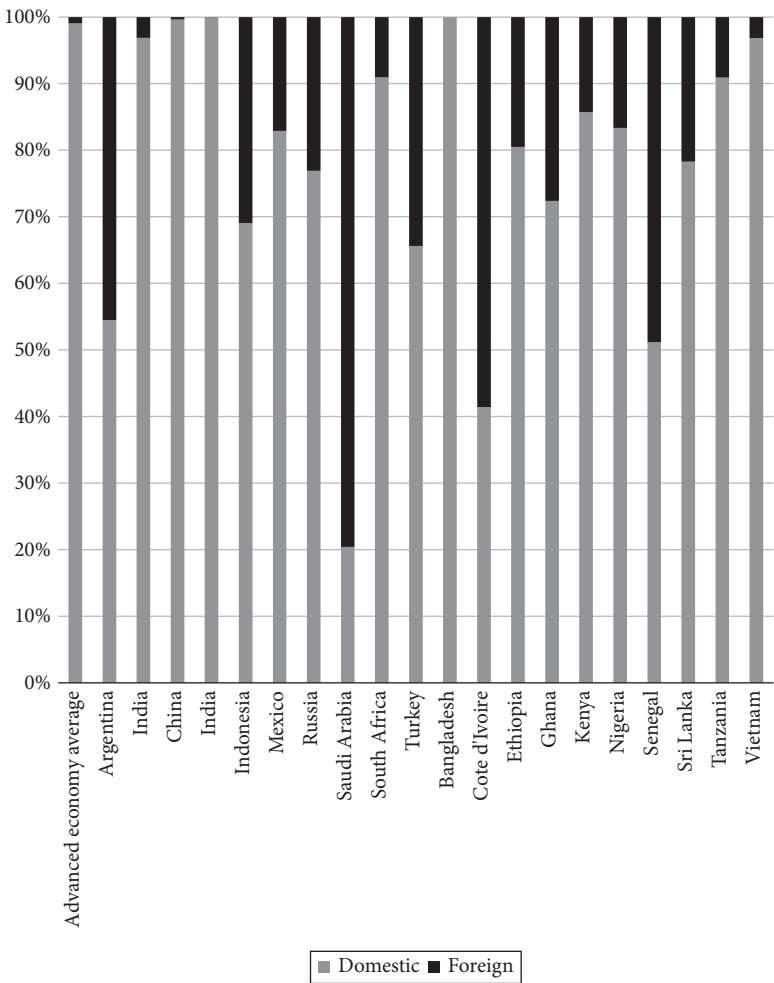


Figure 2.19 Composition of government debt by jurisdiction of issuance, end-2017

Note: Data refer to general government debt securities for advanced and emerging market economies; central government debt securities for developing economies.

Sources: BIS Debt Securities databases; national sources.

Finally, the residency of creditors can be important. This is discussed in more detail in Subsection 4.B which elaborates on the demand side/investor holdings of debt. Countries often issue debt both domestically and externally, but many analysts provide a much greater emphasis on the amount of external debt (see Case Study 2.4) and are much less concerned with the stock of

Case Study 2.4 Different approaches to external debt

Reports and policy papers use the terms “domestic” and “external” public debt. What these terms mean can vary dependent on the context. Indeed, there are at least three concepts of defining whether a debt is domestic or external:

Residency. Following the balance of payment method, the first approach is to define external debt as a resident’s liability to a non-resident. For instance, a German bank lending to say Brazil would be an external debt. A debt would be domestic if both parties, debtor and creditor, are residents of the same country (Gianviti 1989). Accordingly, a Brazilian subsidiary of a German company lending to Brazil would be a domestic debt.

Currency. A second approach is to distinguish the debt whether it is denominated in domestic or foreign currency. This is important since the sovereign needs to purchase foreign currency to service foreign currency debt. Foreign exchange debt also exposes the debtor to foreign exchange risks due to the devaluation risk of the domestic currency (Gianviti 1989). For countries using another country’s currency as a domestic currency (for instance Kosovo using the euro or Ecuador using the US dollar) or for countries in a currency union (such as the euro area), the currency may be both a domestic and a foreign currency; however, the country in question has no or limited control over such currency.

Governing law. A third approach may be to use governing law as the deciding factor to determine whether the debt is external or international. A debt would be external if the liability is governed by the law of another country than the issuing country. This distinction is motivated by a recognition that, with respect to debt governed by domestic law, the legal leverage possessed by holdout creditors is more limited given the capacity of the sovereign debtor to modify its domestic law (IMF 2014). For instance, to facilitate the restructuring of its domestic law governed bonds, in 2012 Greece enacted legislation that aggregated claims across all the affected domestic law issuances, thereby eliminating the power of creditors to obtain a blocking position in an individual issuance.

Continued

Case Study 2.4 Continued

In practice, these concepts overlap. For instance, in most advanced countries, most of the debt is in domestic currency and issued under domestic law, but a good part is often held by non-residents (such as the United States, Germany). Emerging markets typically issue a mix of foreign and domestic currency debt, with domestic currency debt typically issued under domestic law, but foreign currency debt sometimes issued under domestic and sometimes under foreign law (such as Argentina). While foreign law debt is largely held by non-residents, the latter are increasingly participating in domestic law/domestic currency debt. For low-income countries, there is generally more alignment between the concepts: foreign currency debt is foreign law and non-resident held, while domestic currency debt is domestic law and resident-held (with exceptions for frontier markets such as Ghana, Figure 2.20). [reference to Chapter 9]

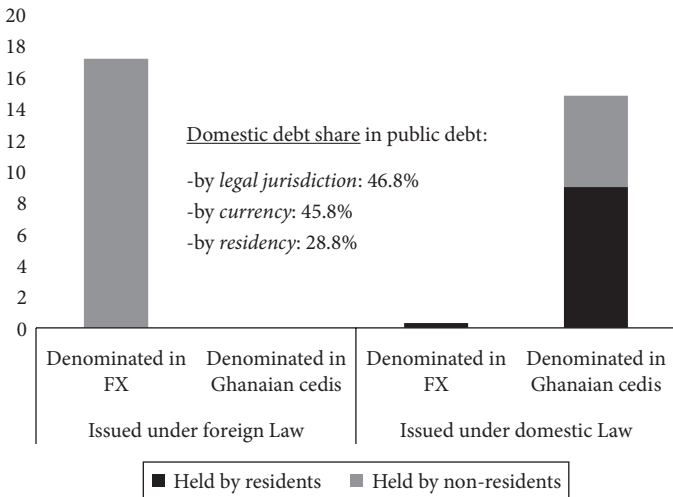


Figure 2.20 Breakdown of Ghana's public debt (US\$ bn, end-2017)

Source: Ghana 2017 Annual Debt Management Report, and authors' estimates.

domestic debt (which may be held by domestic financial institutions and households for whom withdrawing capital is not as much of an option). Heavy reliance on external creditors exposes borrowers to risks related to the global capital markets (assuming the debt is commercial debt), and means creditors are exposed to shifts in investor sentiment, capital flight risks, and hot money flows all of which can come to a crunch during a crisis.

Over time, we have seen significant improvements in the composition of debt, especially for major emerging markets. Over the last decade or so, “dangerous” forms of debt (i.e., short-term and/or foreign currency debt) that increase the likelihood of sovereign debt crises, or render these crises more difficult to manage, have declined for many emerging markets. Similarly, issuance in domestic jurisdictions has increased for most emerging markets, allowing them to avoid some of the litigation risks associated with potential debt restructurings.

Specifically, as of end-2017, about two-thirds of emerging market debt securities are now issued in local currency (Arslanalp and Tsuda 2014b, updated). Similarly, as of end-2017, the average maturity of emerging market debt securities is now 8.3 years, up from 6.9 years a decade ago, according to Bank for International Settlements (BIS) figures. The BIS figures also show that emerging market debt securities are now predominantly issued domestically, with international debt issuance falling in relative terms (even if increasing in absolute terms).

Having said that, beyond these aggregate trends, there are still important differences in debt composition across emerging markets, and these have existed for some time. Guscina (2017) and Jeanne and Guscina (2006) document these differences for nineteen emerging markets during 1980–2012 and show that emerging Asia has had debt structures very similar to those in advanced countries, with a high share of long-term domestic-currency debt. In contrast, Latin America has historically had low shares of long-term domestic-currency debt. In particular, Guscina (2017) documents that domestic long-term local currency-denominated fixed-rate (DLTF) debt represents more than 80 percent of domestic debt for emerging Asia, as of end-2012. In contrast, the corresponding figures for emerging Europe Middle East and Africa (EMEA) and Latin America are about 60 percent and 30 percent, respectively. Those regional differences still exist to a large extent until today.

B. Demand (holders of government debt)

So far, we have discussed how to define and track the outstanding supply of sovereign debt over time. The demand side of government debt—who is holding the debt at any point in time—also matters greatly. In fact, events during the recent euro area debt crisis—and earlier during the emerging market crises of the 1990s—have illustrated that sovereigns, just like banks, can be subject to runs, highlighting the importance of the investor base of debt. Governments have seen sharp rises in borrowing costs or even lost

market access following dramatic shifts in their investor base, even when the supply of debt remained unchanged.¹⁸

While there are several ways to track the supply of debt, statistics on the investor base of debt are harder to come by. Public debt managers typically have only limited information on the ultimate holders of government debt securities once those get traded in secondary markets. For example, a debt manager may pay scheduled interest to an account maintained by Euroclear—a Belgium-based settlement and custodian company—but would not know whether the payment is for a commercial bank in Germany, a fund manager in Luxembourg, or a foreign central bank in Asia.

This data gap poses a risk factor. Fortunately, one can use a standardized approach to compile internationally comparable estimates of investor holdings of sovereign debt. The methodology, developed by IMF staff (Arslanalp and Tsuda 2014a, 2014b), facilitates tracking the investor base of more than US\$50 trillion of sovereign debt on a quarterly basis starting from 2004. The estimates are constructed from publicly available international and national data sources and decompose the investor base into six types of investors—domestic central bank, domestic banks, domestic nonbanks,¹⁹ foreign official sector, foreign banks, and foreign nonbanks. The breakdown allows for constructing risk indices—an investor base risk index (IRI) and a foreign investor position index (FIPI)—to assess a sovereign's vulnerability to a run by investors.

It is worth noting that domestic nonbanks, in many countries, include public sector units such as pension funds, provident funds, or sovereign wealth funds, that like the Central Bank may ultimately hold a lot of government debt. To take one example, in Singapore, at the end of 2017 the Central Singapore Provident Fund, a public unit classified outside of government as a domestic nonbank, holds special issues of Singapore government securities worth 77 percent of GDP. Total Singapore government gross debt was 108 percent, but the vast majority of this debt is essentially owed to one of its own public entities, and then to the citizens of Singapore in future pensions. This presents a very different scenario to other countries with high government

¹⁸ In general, shifts in the sovereign investor base can (i) influence governments' borrowing costs; (ii) affect governments' refinancing risks; and (iii) create potentially harmful sovereign–bank linkages and threaten domestic financial stability, if domestic banks become highly exposed to own government debt.

¹⁹ Nonbanks cover (i) institutional investors other than banks (i.e., insurance companies, pension funds, and investment funds) and (ii) households and nonfinancial corporations. While household or nonfinancial corporate holdings of government debt account for a sizable portion of nonbanks in some countries (Italy and UK), institutional investors usually make up the bulk of nonbank holdings. Foreign official sector covers (i) foreign central banks holding other country debt securities as reserve assets and (ii) foreign official lending in the form of bilateral or multilateral official loans

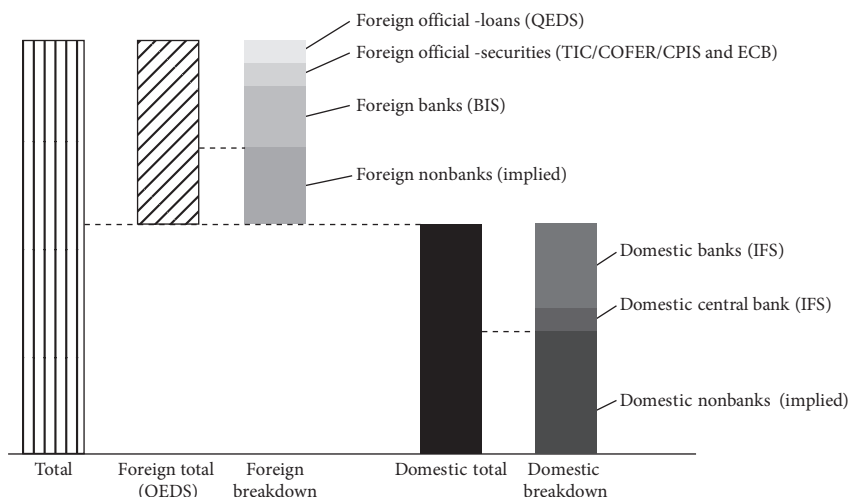


Figure 2.21 Compiling of sovereign investor base estimates—summary of methodology

Source: Arslanalp and Tsuda (2014a).

debt levels and explains (alongside the government's considerable financial assets) why you hear little concern expressed about what is, on the face of it, a very high level of sovereign debt.

The methodology used to compile the investor base holding of sovereign debt are summarized in Figure 2.21. The approach has the following characteristics: First, a common definition of sovereign debt is used—general government gross debt covering currency and deposits; debt securities; and loans. Second, a common estimation methodology is used to ensure cross-country comparability based on harmonized international data sources, such as the BIS, IMF, and World Bank. Third, all data are compiled in face value to track investor transactions as well as holdings. Fourth, foreign investor holdings are estimated separately for the foreign official sector, foreign banks, and foreign nonbanks, in contrast to national data sources that usually classify them under one category (“rest of the world”).

The estimates have been published online since 2012 with semi-annual updates²⁰ and are summarized in Figures 2.22 and 2.23.

In some cases, this approach could be extended to estimate the country of origin of investor holdings. For illustration, Figure 2.24 shows the geographical

²⁰ See IMF, Sovereign Debt Investor Base for Advanced Economies, available at https://www.imf.org/~media/Websites/IMF/imported-datasets/external/pubs/ft/wp/2012/Data/_wp12284.ashx and Sovereign Debt Investor Base for Emerging Markets, available at <https://www.imf.org/~media/Websites/IMF/imported-datasets/external/pubs/ft/wp/2014/Data/wp1439.ashx>

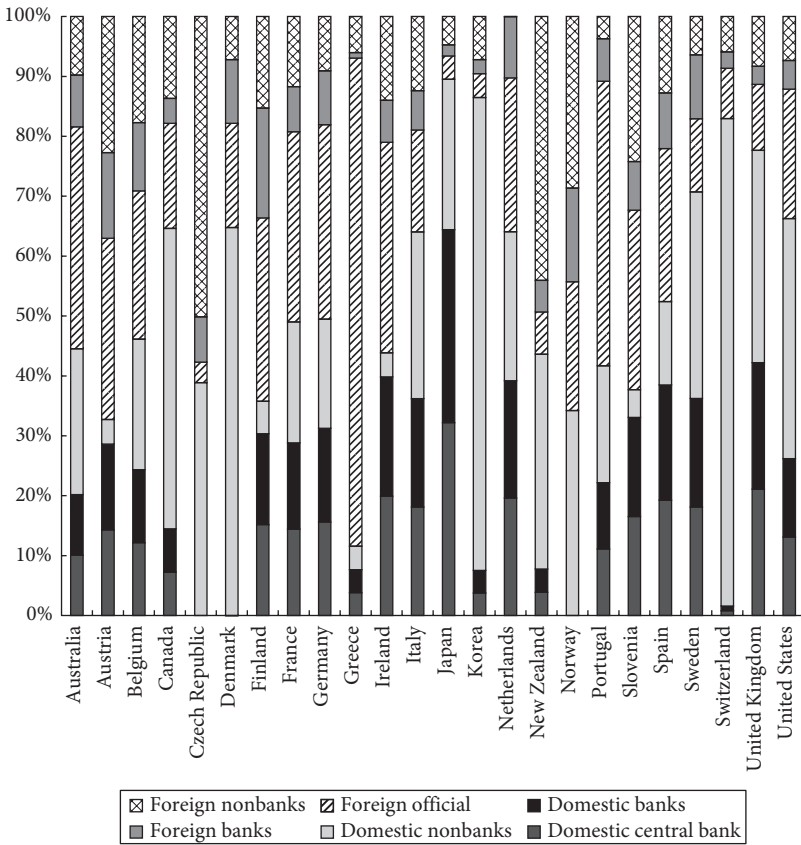


Figure 2.22 Advanced economies: holders of general government debt, end-2017 (in % of total amount outstanding)

Source: Arslanalp and Tsuda (2014a) updated.

decompositions of the investor base of the general government debt of Greece and Japan. Examining investors' country of origin can help assess spillover channels (e.g., euro area holdings of Greek debt), as well as emerging regional linkages (e.g., Chinese investment in Japan).

Finally, having a view of investors across countries is essential for understanding the dynamics of global demand for government debt. Changes in global investor's allocations among countries are important because they can affect many countries all at once. For example, during 2010–13, foreign official holders replaced almost all the foreign private holders of Greece's sovereign debt. In contrast, some of these foreign private investors appear to have shifted to safer assets, such as German bunds, as shown in Figure 2.25 for illustrative purposes.

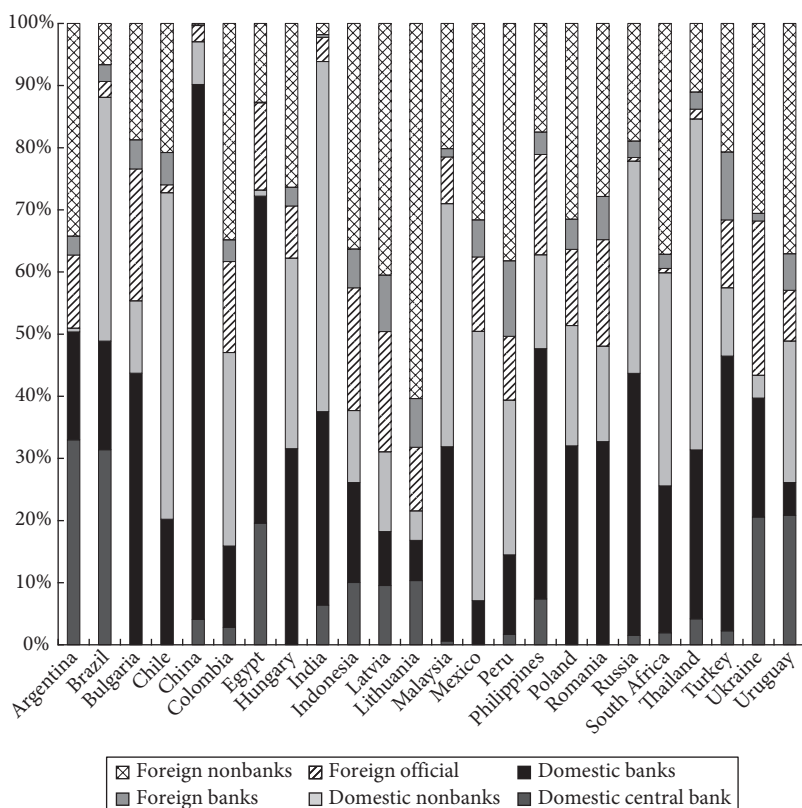


Figure 2.23 Emerging markets: holders of general government debt, end-2017 (in % of total amount outstanding)

Source: Arslanalp and Tsuda (2014b) updated.

5. Conclusions

When Fred Durst erected his debt clock in 1989, it was to raise awareness of what he saw as the United States' rising debt and the burden he thought it would cause future generations. But Mr. Durst's clock, and its imitators in other countries, provide an overly simplistic picture of government debt and fail to capture its many complexities.

Which entities are included in the measure of debt, which instruments are captured and how they are valued are all important pieces of information. Information on risks outside the balance sheet, such as contingent liabilities, should also be taken into account. And additional information on the currency of denomination, maturity, creditor profile, and legal jurisdiction would be needed to complete the picture on government liabilities. To complete the

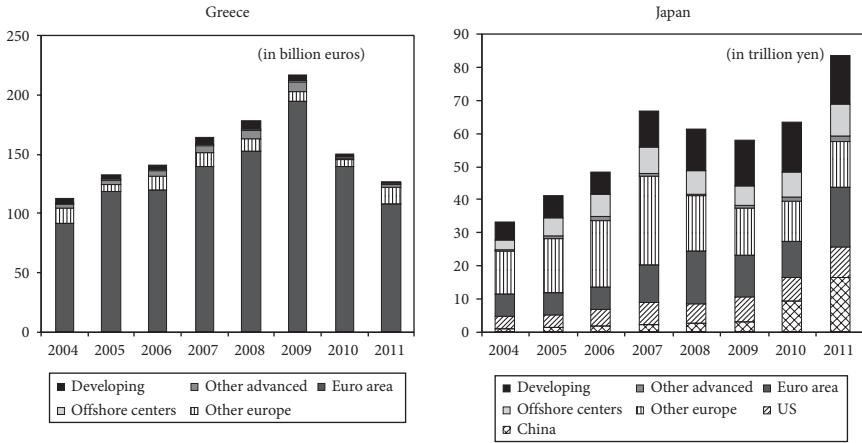


Figure 2.24 Foreign holdings of government debt by country of origin

Notes: Excluding foreign official loans and SMP holdings of foreign central banks. Regional groups are based on country classifications of BIS international banking statistics.

Sources: IMF CPISand authors' calculations.

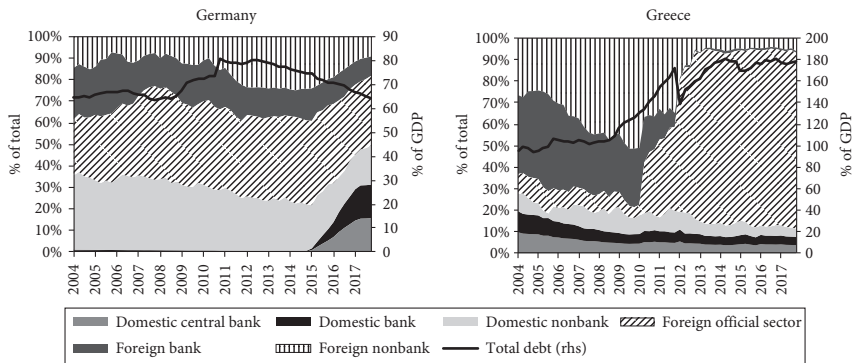


Figure 2.25 Holders of advanced economy general government debt, 2004–17 (components in %; total in % of GDP)

Source: Arslanalp and Tsuda (2014a) updated.

fiscal picture, one would also need to incorporate information on a country's public sector liabilities outside government, in state-owned enterprises, as well as the assets the public sector owns.

A debt clock or headline measure of debt can be seen as analogous to the odometer in a car, measuring the total debt acquired at a certain point in time using a set metric. However, what may really be needed to successfully pilot your macroeconomy may be a suite of different measures of stocks and flows that more closely resembles the cockpit of a jumbo jet. This chapter provides an overview of the reasons why the answer to the question “What

is the national debt of the United States?” can generate answers differing by trillions of dollars and, as with all macroeconomic statistics or accounting data, highlights the importance of metadata to ensure you fully appreciate how to interpret the data.

Annex 1. A country coverage in IMF debt sustainability analysis

The IMF takes a keen interest in the public finances, and the debt, of its member countries. IMF Article IV reports include fiscal tables and Debt Sustainability Analyses (DSA) for its member states, which are presented to the IMF Board, and published online. In addition, the IMF releases databases and publications (such as the World Economic Outlook and Fiscal Monitor) which provide information on government debt.

Despite IMF attempts to codify debt, and provide standard definitions, for example in the 2011 IMF *Public Sector Debt Guide for Compilers and Users* and the *Government Finance Statistics Manual 2014* and earlier editions, debt data used by the Fund for DSA remains a mixture of central government, general government, and other types of coverage, such as the nonfinancial public sector. This variation in which entities are included in debt, although disclosed in metadata, reduces the extent to which debt data in IMF publications and databases is cross-country comparable.

<i>Last DSA Issuance</i>	Total	AE	EM
General government	59	27	32
Central government	31	4	27
Nonfinancial public sector	9	0	9
Consolidated public sector	8	2	6
Other*	5	0	5

Annex 2. Statement of fiscal risks (taken from Everaert et al. 2009)

A statement of fiscal risks can be structured by grouping similar risks: macroeconomic risks (e.g., from growth, terms-of-trade, and exchange and interest rates); contingent obligations (e.g., government guarantees); risks due to the operations of public–private partnerships (PPPs) and state-owned enterprises (SOEs); central government backing of subnational levels of government; risks related to natural disasters; and fluctuations in the value of public sector assets. To avoid moral hazard, implicit risks—including those from the banking system and ongoing litigation against the state—in principle should not be disclosed. However, actions already announced or undertaken should be fully disclosed and discussed.

For each type of relevant risk, the statement could discuss past realization and forward-looking risk estimates. The discussion and quantification of past risks provides background to policies aimed to reduce such risks in the future. For instance, systemic revenue overestimation points to the need for more detailed analysis of the underlying assumptions

and method for estimating revenue, including the economic growth assumption. Similarly, frequent bailouts of PPPs, SOEs, and subnational levels of government may call for strengthening the monitoring and central control of their activities.

Forward-looking risk estimates can draw on existing country practices for disclosing risks, that is, (i) sensitivity analysis to key macroeconomic variables, alternative macroeconomic scenarios, stress tests for fiscal aggregates, or fan charts that illustrate the probability distribution for outcomes; (ii) debt sustainability analyses; (iii) description and quantification of budget exposure to government guarantees through option pricing models, stochastic simulation, or risk ratings approaches; (iv) description of government guarantees in PPP projects, alongside the projects' face value, expected cash flow payments by the government and their net present value; and (v) the nature and scope of ongoing litigation against the state.

In addition, full-fledged general government or public sector accounts and timely audited SOE accounts provide a good source of information for a statement of fiscal risks.

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The Motive to Borrow

*Antonio Fatás, Atish R. Ghosh, Ugo Panizza,
and Andrea F. Presbitero*

1. Introduction

The issuance of public debt is an important tool of economic policy. Borrowing can help governments deal with negative shocks, undertake countercyclical fiscal policy, and finance exceptionally large expenditures, such as public infrastructure investments. Many governments, particularly in advanced economies, responded to the Global Financial Crisis with exceptionally large debt-financed fiscal stimulus. In the United States, for instance, the Obama administration in 2009 approved the USD831 billion (5.5 percent of GDP) American Recovery and Reinvestment Act to help boost investment and job creation. US government debt increased from 64 percent of GDP in 2007 to above 100 percent in 2012. In advanced economies, the average debt-to-GDP ratio rose from about 60 percent in 2007 to over 90 percent in 2016. Stimulus spending and cyclically-lower revenues also resulted in higher public debt—at various levels of government—in many emerging markets as well. China is a case in point. The government embarked on a massive infrastructure and public investment program, spending more than 6 percent of GDP in discretionary stimulus measures and allowing public debt to increase from 29 percent of GDP in 2007 to 44 percent of GDP by 2016. More recently, the big infrastructure push associated with the China's Belt and Road Initiative is contributing to growing public debts and possibly to sustainability risks in some emerging market and developing countries (Case Study 3.1).

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Case Study 3.1 Balancing investment needs with debt sustainability, the case of Ethiopia

The 2030 Sustainable Development Agenda set ambitious targets for inclusive development, which will require a large scale up of investment over a long period of time. While the private sector should play a key role to mobilize resources, public investment is expected to increase significantly in several countries. At the same time, rising public debt is a source of concern in many developing countries, especially in Africa, where, after the sharp decline of debt levels thanks to the debt relief initiatives of the early 2000s, debt-to-GDP ratios are rising again—driven mostly by large primary deficits and the scaling-up of public investment (IMF 2018a). Rising debts and external imbalances are undermining debt sustainability and could pose a threat for future investment plans and sustained economic growth.

A case in point is Ethiopia. Public investment was above 7 percent of GDP in the 2000s and further accelerated in the last seven years (public investment was at about 15 percent of GDP between 2014 and 2017). This massive scale up of investment was funded by external concessional and non-concessional financing (including large Chinese investment flows), and partly facilitated by restrained government consumption, financial repression and an overvalued exchange rate (World Bank 2016). This policy mix allowed the expansion of a substantial physical infrastructure and the development of large projects, like the Grand Ethiopian Renaissance Dam and the railway connecting Addis Ababa with the port of Doraleh in Djibouti, which will significantly reduce trade costs and improve access to global markets for Ethiopian firms. The dam is estimated to cost almost USD 5 billion—about 5 percent of GDP—and once completed it will be the largest hydroelectric power plant in Africa, supplying energy also to Sudan and Egypt.

The large investments in infrastructure undertaken in recent years have started bearing fruits, as Ethiopia experienced a sustained rapid growth in the last decade, with real GDP growth averaging 10 percent annually. At the same time, poverty declined substantially and the provision of key public services has improved. The share of the population with access to electricity, for instance, has increased from 14 percent in 2005 to 43 percent in 2016.

Continued

Case Study 3.1 *Continued*

Significant gaps still remain, however. According to estimates from the Global Infrastructure Hub, Ethiopia faces an investment shortfall of about USD 285 billion to achieve the targets set by the 2030 Agenda. But further investment has to be planned keeping in mind that the model used in the past to finance the infrastructure expansion is starting to show its limits in terms of debt sustainability, crowding out of private credit, and weak external competitiveness due to exchange rate appreciation (World Bank 2016). In particular, although the debt-to-GDP ratio declined from 107 percent in 2002 to 38 percent in 2009 (thanks to debt relief), since then it started to increase sharply and reached 62 percent in June 2018. Even in the presence of sustained economic growth, the adverse debt dynamics is reflected in the IMF and World Bank assessment, according to which Ethiopia is at high risk of debt distress (IMF 2018b). Moreover, absorptive capacity constraints could undermine the projects' success rate and reduce the dividend of public investment (Presbitero 2018). As a result, investment has recently started declining and the large external imbalances and the public debt burden are constraining future growth.

The experience of Ethiopia, although unique in a number of respects, can be generalized to other developing countries, at least with regard to the trade-off between investment financing and debt sustainability. A key lesson for policy makers is that, even in presence of strong growth and large investment needs, any investment scaling up has to consider the risks that debt-financed public investment and higher public debt could pose on debt sustainability and future economic growth.

While there are good reasons to issue debt, there are also political failures that induce governments to borrow too much—leading, in some cases, to public debt levels that are hard to rationalize as the optimal decision of a benevolent social planner. Such excessive debt accumulation may be costly inasmuch as it circumscribes future capacity to stabilize the business cycle or impairs economic growth, either by crowding out private investment or by increasing uncertainty about future tax and inflation rates. (Risks of public debt becoming unsustainable and leading to a debt crisis are discussed in Chapter 4.)

This chapter discusses why governments borrow, separating good reasons for issuing debt (Section 2) from bad ones (Section 3). Next, it describes the

link between public debt and economic growth (Section 4) before offering some concluding remarks (Section 5).

2. Good Motives to Borrow

Budget deficits are the buffer that governments use to delink intertemporally spending and revenues. Why not always balance the budget? The principle of tax smoothing states that during periods of exceptionally high spending the government should run a deficit to finance those expenditures with future taxes. These periods may be the result of various shocks (wars, natural disasters, etc.) or spending decisions that reflect an expected economic, financial, or social benefit. Increasing spending during recessions can smooth the business cycle—raising employment, output, and incomes. Public investment can lead to faster growth. Accommodating the need for structural reforms via short-run deficits can pay off in the future via higher GDP and higher tax revenues. In all these cases, the principle of tax smoothing states that the government should run a deficit. At the same time, the government must be mindful that the spending will indeed reap the expected benefit—and that it is not undertaking the expenditure simply because there is easy financing available.

In this section we begin by elaborating on the principle of tax smoothing and then discuss some of the cases where attention needs to be paid to the returns on investment. We finish by presenting an additional argument for the government to issue debt—namely to provide the private sector with a safe asset.

A. The logic of tax smoothing

Governments have long financed extraordinary expenditures by issuing debt—most notably, when fighting wars.¹ Often, it would have been socially and politically unacceptable to try to finance such a level of expenditure through contemporaneous taxation alone, so the government resorted to issuing debt.² But there is also a sound economic rationale. If the government can only raise distortionary taxes, and if the cost of the economic distortion is convex

¹ One of the few non-war related examples of “public” debt was the perpetual bonds issued by the water authority of Lekdijk Bovendams of the Netherlands in 1648. The Lekdijk Bovendams water authority, though not a sovereign government, had taxation powers over the residents protected by the dam; the bonds issued in 1648 continue to pay interest to this day.

² It is even possible that the government raises tax rates by so much that revenues *fall* (i.e., taxes are on the “wrong side” of the Laffer curve), making it physically impossible to finance the spending.

(i.e., increasing at an increasing pace) in the tax rate, then it makes sense to try to “smooth” taxes over time in order to minimize the total distortionary cost.

One of the first to articulate the concept of tax smoothing explicitly was US Secretary of the Treasury, Albert Gallatin (1807), who argued:

It appears necessary to provide revenues at least equal to the annual expenses on a peace establishment, the interest on the existing debt, and the interest on loans that may be raised. [As to] whether taxes should be raised to a greater amount or loans be altogether relied upon for defraying the expenses of the war... the losses and privations caused by war should not be aggravated by taxes beyond what is strictly necessary. An addition to the debt is doubtless evil, but experience having now shown with what rapid progress the revenue of the Union increases in time of peace; with what facility the debt, formerly contracted, has been reduced; a hope may be confidently entertained that all the evils of war will be temporary and easily repaired; and that the return of peace will, without any effort, afford ample resources for reimbursing whatever may have been borrowed during the war.³

The idea was formalized by Barro (1979), who assumed a convex cost function, and showed that minimizing the present value of the distortionary burden involved equalizing the marginal cost of levying taxes over time. For a given tax base, this implies that the tax rate should be constant over time. If public expenditure is fixed, governments should run deficits and accumulate debt in bad times (when the tax base is cyclically low) and run surpluses and pay down debt in good times (when the tax base is high).⁴

While the logic of tax smoothing is clear, the problem that governments confront is that their expenditure is unlikely to be smooth—the classic example being that of a war. But the argument applies more generally: whenever there is some “lumpiness” in the government’s spending, there will be a divergence between the time path of expenditure and the (optimally) constant taxes—with deficits (and hence debt) making up the difference. In fact, it can be shown that optimally, the government’s overall balance should equal the present discounted value of expected future *changes* in government spending (Ghosh 1995a). Thus, tax smoothing applies only to temporary changes in spending: if there is a permanent increase or decrease in spending, then the

³ See Hall and Sargent (2014).

⁴ If taxes are not distortionary, Ricardian equivalence holds, and there are no transactions costs in the trading of government securities, then a form of the “Modigliani–Miller” theorem of public finance obtains—and the level of government debt at any moment is indeterminate (Barro 1979; Stiglitz 1988; Chan 1983). As discussed in section 2.D, however, there may still be good reasons for the government to issue debt—e.g., to provide a safe asset for financial markets.

expected change is zero, and the government should run neither a deficit nor a surplus. If the change in spending is permanent, then its burden cannot be spread over time to reduce the distortionary cost of the associated taxes. On the contrary, running a deficit in the face of a permanent rise in government spending would imply that—if the government is to respect its budget constraint (and not default)—eventually, it would have to raise taxes by even more to pay for both the higher spending and the interest on the accumulated debt thus violating the principle of tax smoothing.

Taking the logic one step further, if the government recognizes that it may face unexpected shocks (that raise spending above its normal level), it may want to “save for a rainy day” by accumulating assets or paying down debt (Aiyagari et al. 2002).⁵ Calibration exercises for the US government by Bhandari et al. (2016) suggest that in the long-run, the government should hold a positive, albeit small, net asset position as precautionary savings against future spending shocks. In general, the government will want to hold a portfolio of debt and financial assets that minimizes the risk that it will have to alter tax rates across time or states of nature (Bohn 1990; Barro 1995). Building on this premise, numerous academic papers have explored the optimal capital structure of the government’s assets and liabilities in a stochastic setting.⁶

Three points are noteworthy about the tax-smoothing argument for issuing debt. First, for a given the level of output (GDP), unless the government is borrowing from foreigners, the issuance of public debt does not increase the resource envelope of the economy (except when the fiscal stimulus raises output, as in the Keynesian models discussed in section 2.B below). Domestic public debt then necessarily crowds out private absorption (consumption or investment). Therefore, the only purpose of such borrowing would be to smooth taxes and thus lower the distortionary cost to the economy. But if the government borrows from foreigners—either directly or indirectly (i.e., issues debt to residents who in turn borrow from abroad)—then such borrowing would also expand the economy’s real resource constraint, allowing the

⁵ This idea was also anticipated by Gallatin, who in his 1807 Report wrote “A previous accumulation of treasure in time of peace, might, in a great degree, defray the extraordinary expenses of war, and diminish the necessity of either loans or taxes. It would provide during periods of prosperity, for those adverse events to which every nation is exposed, instead of increasing the burdens of the people when they are least able to bear them” (Gallatin 1807: 359). Again, this is in direct analogy to the intertemporal current account literature where uncertain national cash flow leads to the country running a larger surplus or smaller deficit than it would under certainty (Ghosh and Ostry 1997).

⁶ See, for example, Kingston (1991), Zhu (1992), Chari et al. (1994), Barro (1995), Judd (1999), Angeletos (2002), Buera and Nicolini (2004), Marcet and Scott (2009). Berck and Lipow (2011) discuss how the tax-smoothing motive gets modified when the risk premium on government bonds is endogenous.

private sector to also smooth consumption against shocks to government spending. In such cases, there will be a positive association between the issuance of public debt and external (private or public) debt.

Second, while the government's ability to issue debt is welfare improving—*inter alia*, because it allows for tax smoothing—the debt itself becomes a dead-weight loss once issued. Even purely domestic debt—“a debt we owe ourselves”—represents an economic loss, equal to the present value of the economic distortions associated with the taxes necessary to repay it.⁷ (If the public debt is held externally, then there is an additional real resource transfer that will need to be made to non-residents.) The greater the inherited debt, the higher the taxes required to service it. If taxes are distortionary and fall on any factor (e.g., labor or private capital) that is complementary to the productivity of public capital, then—optimally—a government that inherits a higher level of public debt will undertake less public investment, with corresponding effects on output and growth (Ostry et al. 2015).

Third, the logic of tax smoothing seems to apply regardless of the cost of borrowing. Intuitively, however, for a given spending shock, a government will want to borrow less the higher the interest rate it must pay on its debt. In fact, this result follows from the tax-smoothing argument. The simplest example is when output (the tax base) and government spending are constant. Taxes would then be set to equal government spending plus the interest on the stock of debt. In such a situation, if there was an unexpected, temporary increase in government spending (e.g., a war), then the government should deficit-finance the higher spending. Taxes would (by tax smoothing) be immediately and permanently raised to cover the additional interest on the debt that will have been accumulated during the period of exceptional spending. Now, if the government faces a high interest rate on its borrowing, then taxes have to be raised correspondingly high. But since taxes are raised immediately to their permanent higher level, for a given spending shock, a government that faces a high interest rate on its debt would run a smaller deficit (i.e., borrow less) than a government that faces a low interest rate.

⁷ Even with purely domestic public debt, it makes a big distributional difference to who is the “we” and who is the “ourselves.” In the Lucas and Stokey (1983) framework, the debt is held by a single representative agent but the government has only distortionary taxes at its disposal for servicing the debt. The optimal policy in this situation would obviously be for the government to default on its debt (since it is owed to the representative agent who also pays all taxes, but the act of servicing the debt imposes a deadweight distortionary cost on the economy). Since Lucas and Stokey rule out default by assumption, the time-consistent solution consists of a series of “mini-defaults” with each successive government manipulating the interest rate—by issuing more debt (which boosts current period consumption, and reduces the interest rate payable on the inherited debt).

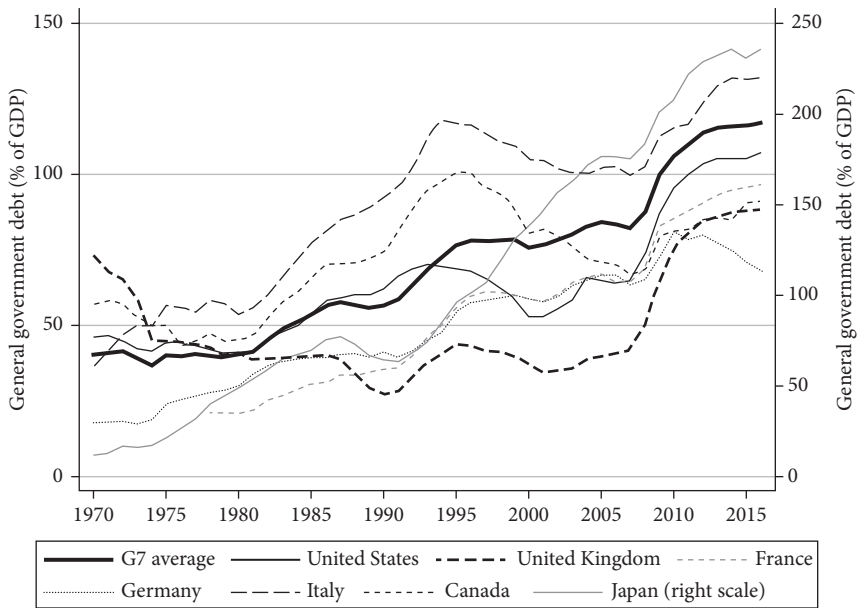


Figure 3.1 The evolution of the debt-to-GDP ratio in G7 countries

Source: Global Debt Dataset (Mbaye et al., 2018).

Summing up, the tax-smoothing argument suggests that countries should accumulate public debt to finance large and lumpy expenditures. While there is ample evidence that countries do accumulate debt during wars, tax smoothing is hard to reconcile with long-term debt accumulation during tranquil periods (the average debt-to-GDP ratio of the G7 countries rose from about 40 percent in 1970–80 to over 80 percent by 2007, see Figure 3.1). The link between debt accumulation and investment is even less clear. A simple regression that controls for country- and year-fixed effects shows a positive correlation between the debt-to-GDP ratio and public investment in advanced economies, implying that a 1 percentage point change in the debt-to-GDP ratio is associated with a 0.04 percentage point increase in public investment (Figure 3.2). This suggests that, typically, only a small percentage of debt issuance (4 percent) is used to finance public investment projects.⁸ Bacchiocchi et al. (2011) find a negative correlation between debt and public investment in countries with a high debt ratio, and a positive correlation between debt and public investment in countries with low debt ratios. This may help explain the

⁸ In emerging and developing economies, the correlation between public debt and public investment is instead negative but not statistically significant.

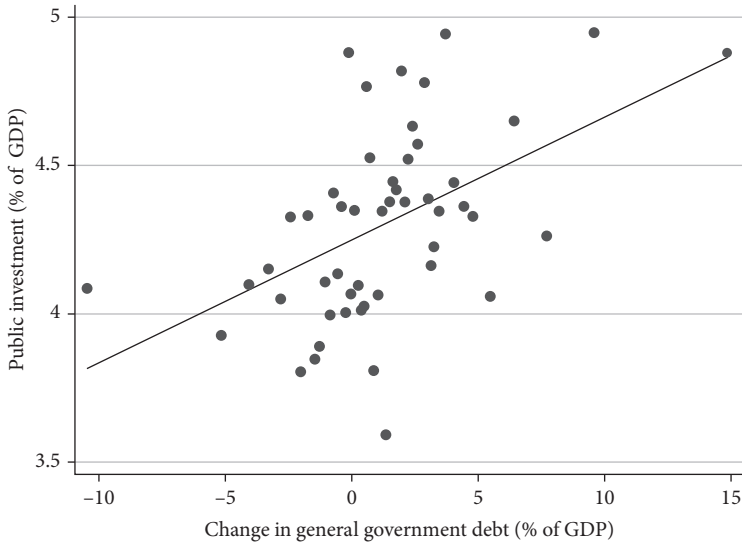


Figure 3.2 Correlation between change in public debt and contemporaneous public investment

Notes: A regression of the ratio of public investment over GDP at time t against the change in the ratio of general government debt over GDP between t and $t-1$, controlling for year and country fixed effects, gives a coefficient on the debt variable of 0.041 (p-value of 0.011), meaning that a 10% increase of the debt-to-GDP ratio is associated with 0.4% lower ratio of public investment over GDP. To generate the binned scatterplot, starting from the sample of nineteen OECD economies (data on general government for New Zealand are not available), the change in the ratio of general government debt over GDP between year t and $t-1$ (x-axis) and public investment (as a % of GDP, y-axis) in year t are regressed against year and country fixed effects. Then, the x-residuals are grouped into fifty equal-sized bins and the chart plots, for each bin, the mean of public investment (as a % of GDP) in year t , within each bin, holding the controls constant. The diagonal line is the linear fit of the OLS regression of the y-residuals on the x-residuals. The number of observations is 899.

Source: Global Debt Dataset (Mbaye et al., 2018) and World Economic Outlook.

diversity of empirical results regarding the link between public debt and output growth, explored further in Section 4 below.

B. Keynesian demand stimulus

One example of temporary increases in spending is countercyclical fiscal policy that governments often implement during recessions. While in many ways this fits our previous logic of tax smoothing, it adds a second dimension and justification for that spending. The discussion thus far has taken output as given and considered optimal fiscal policy for an exogenous path of GDP. But during recessions, governments also try to boost output, so a full assessment of the benefits of running deficits must take account of this as well.

Why countercyclical policy is needed

In most macroeconomic models, monetary and fiscal policy are effective tools to stabilize the business cycle. In open economies, the Mundell–Fleming results imply monetary policy will be ineffective under fixed exchange rates and an open capital account, so only fiscal policy is available. The traditional Keynesian IS-LM model shows how changes in spending and taxes help stabilize aggregate demand by acting as a counteracting force to changes in private spending, which forms the basis of most policy discussions on the need for countercyclical policy (IMF 2008). More sophisticated (New Keynesian) models can also validate the IS-LM intuition in dynamic and optimizing environments (Beetsma and Jensen 2005).

In these models, monetary and fiscal policies are, in a sense, substitutes for stabilizing output. While monetary policy may be implemented faster and be less subject to political interference than fiscal policy—except in regard to automatic stabilizers, Taylor (2000)—there may be instances when monetary policy cannot achieve the first-best result, even with a flexible exchange rate.⁹ For instance, monetary policy may be constrained by the zero lower bound on interest rates—as was the case for many central banks during the Global Financial Crisis—so the burden necessarily falls on fiscal policy (Eggertsson and Woodford 2004). More generally, in the presence of more than one distortion in the economy, not just price rigidity, monetary policy may not suffice to bring the economy to its first-best outcome and could be usefully complemented by fiscal policy (Blanchard and Gali 2010).

The normative statement that fiscal policy should be countercyclical is not always borne out empirically, however—especially in emerging markets, Latin American economies in particular (Gavin and Perotti 1997; Kaminsky et al. 2004). In part, this may be because the scope for deficit financing during downturns is more limited in such countries, while the lack of fiscal discipline during the upswing may reflect political economy considerations (as discussed in Section 3, below). Recent evidence—notably post-Global Financial Crisis—is more encouraging (Frankel et al. 2013).

The evidence for OECD or European economies is mixed. Fiscal policy is countercyclical but occasionally it turns procyclical, as in the case of recent fiscal consolidations in European countries (Égert 2012; Fatás 2018). One problem is judging the output gap in real time; especially after a financial

⁹ When the government is not indifferent to the level of the exchange rate (or its external balance), monetary policy has traditionally been “assigned” to the external objective and fiscal policy to the internal objective (i.e., minimizing the output gap and maintaining full employment).

crisis, the trajectory for potential output—and hence the output gap—may have changed. Procyclical policy has negative economic consequences as it leads to higher output volatility and lower growth (Aghion et al. 2007).

Countercyclical policy, deficits, and debt

How do we characterize countercyclical fiscal policy? A commonly-used indicator of the fiscal policy stance is the change in the inflation-adjusted budget balance as a ratio to GDP (Blanchard 1993). Spending directly affects aggregate demand while taxes help stabilize disposable income and therefore private spending. The effects of taxes and spending might not be identical, but the budget balance comes close enough to capture their combined effect. This establishes a direct connection between stimulative fiscal policy and debt. When growth is below trend, governments will run deficits, and thus debt will accumulate.

It is important to distinguish between automatic and discretionary changes, even if from the perspective of aggregate demand this is largely irrelevant—it is the overall balance that matters. Automatic stabilizers capture changes in the budget balance that are the result of tax or spending laws that were not decided or modified as a result of current economic conditions. What is needed is not always strong cyclicity in taxes or spending. In fact, the largest source of automatic stabilizers in advanced economies is *acyclicity* of public spending. If the government maintains spending constant when GDP is falling, then even if taxes are proportional (so there is no extra countercyclicity in the tax schedule), deficits will increase. In this stylized case, the magnitude of the automatic stabilizers is simply proportional to size of government. The data show that the majority of automatic stabilizers among advanced economies comes from this effect (Fatás and Mihov 2012).

Beyond automatic stabilizers, governments also engage in discretionary fiscal policy changes. These changes follow the same logic as they also contribute to deficits and accumulation of debt during downturns. There is evidence, among advanced economies, that discretionary fiscal policy is used more aggressively in those countries that have the weakest automatic stabilizers (because of their smaller government size)—highlighting the substitutability between these two types of fiscal policy (Fatás 2009).

From cyclical deficits to accumulation of debt

Governments should—and do—run deficits during downturns. But if governments plan properly, then this should have no effect on public debt over the long run as debt would rise during downturns but decline during

recoveries.¹⁰ As discussed in the section considering why countercyclical policy is needed, however, public debt was increasing in many advanced economies—despite the booming world economy—even before the Global Financial Crisis and the ensuing Great Recession.¹¹ Can this trend be related to the dynamics of stabilization policy over the cycle? Is there an asymmetry? And if so, why?

There are at least several possible sources of asymmetries. First, while governments are ready to apply countercyclical policies during recessions, they are less likely to follow the same logic during expansions. This is related to our earlier argument about observed procyclical policies (or not enough countercyclical policies). Empirically this is the case, at least for some countries (see Fatás and Mihov (2010) for a sample of European countries or Alesina et al. (2008) for a larger sample). The next section discusses the political distortions that may lead to such asymmetry.

The second reason is not so much about the political incentives of governments but about excessive optimism or pessimism when forecasting GDP growth. For example, during periods of strong growth, governments produce forecasts of potential output growth that are too optimistic. As the data confirm, estimates of potential output and its growth rate tend to be highly procyclical and this leads to excessive expansionary fiscal policy in good times (Mc Morrow et al. 2017). As an example, in December 28, 2000, President Clinton announced that the United States was on course to eliminate its government debt within the following 10 years. The macroeconomic scenario supporting this forecast did not incorporate the 2001 and 2008 recessions (nor, in fairness, did it foresee the Afghanistan and Iraq Wars).¹²

Is this bias in growth forecasts only present in good times? Not quite; we also observe excessive pessimism during downturns when potential output estimates are revised downwards. This leads to excessively tight fiscal policy during recessions, which in principle should offset the effect on debt of the excessive optimism during expansions. Beyond the difficulties in predicting turning points and lags in the implementation of discretionary fiscal measures (which can result in a net bias toward larger deficits and higher debt on

¹⁰ This was part of UK Chancellor Gordon Brown's "Golden Rule"—that, balanced over the economic cycle, public debt should not increase for current expenditures.

¹¹ Contrary to the dictates of tax smoothing, moreover, many advanced economies were running up debt even though they faced rising health and other public expenditures related to aging populations.

¹² See https://clintonwhitehouse4.archives.gov/WH/New/html/Fri_Dec_29_151111_2000.html

average) there are two other sources of asymmetry that can generate a drift of debt ratios:

1. There could be an interaction between procyclical GDP forecasts and political economy considerations (discussed in section 3.A below) whereby the procyclical forecast bias during expansions is acted upon while the bias during recessions is (intentionally) ignored. If this is the case, the overall bias will be towards higher debt.
2. But there is also an asymmetry in terms of the way the economy reacts to procyclical fiscal policy as multipliers tend to be larger during recessions than during booms (Freedman et al. 2010; Auerbach and Gorodnichenko 2013; Jordà and Taylor 2016). As a result, the procyclical nature of fiscal policy will cause more damage to GDP during downturns than during expansions—especially when monetary policy is constrained by the zero-lower bound (and unable to stabilize output). There may even be hysteresis (i.e., permanent effects of cyclical shocks) such that the negative effects on GDP are permanent, validating the unfounded pessimistic expectations of governments. Such dynamics can lead to the perverse situation where a government engages in contractionary fiscal policy to reduce debt ratios but ends up instead with *higher* debt-to-GDP ratios. This is what the literature calls self-defeating fiscal consolidations (see Fatás 2018; or DeLong and Summers 2012). In this case, the resulting bias is again towards more debt despite the government's pessimistic view about GDP growth leading it to be overly conservative in its fiscal policy. Unlike in the previous cases, however, the solution here is for a more aggressive policy (larger deficits during crises) to avoid the negative effects on GDP.¹³

The accumulation of debt in times of crisis is not solely the result of standard Keynesian countercyclical policy but may also reflect government bailouts of the financial sector, which can result in as large or even larger increases in debt than stimulus spending (Campos et al. 2006; IMF 2015). This is important because, even if potential GDP forecasts are unbiased, estimates of debt will be too optimistic if they do not take account of the occasional support for the financial system during crises. Once these—hopefully rare—events happen, debt levels will be higher than expected. At that point, the logic of tax

¹³ Of course, larger deficits are the optimal response assuming that there are no borrowing constraints by governments. In practice, some governments might see risk spreads and interest rates increase in a way that makes additional borrowing impossible.

smoothing that we have discussed earlier implies that debt levels will remain higher for a long time as the adjustment is optimally spread over many years (Ostry et al. 2015).¹⁴

C. Long-term investment and deficits

Investment projects financed by the government fall into the category of lumpy spending that, according to our tax-smoothing argument, should be financed by deficits. But unlike other forms of spending (i.e., government consumption), here the government is acquiring an asset that will deliver services in the future. This strengthens the argument for financing investment with debt.¹⁵

The welfare effects of debt-financed investment will depend on the social returns of the projects. Although this is also true for any other form of government spending, investment is typically assumed to deliver a social or even a financial return that justifies the spending, which might even generate the taxes necessary to repay the debt in the future. The greater the reliance on some nebulous social benefit in making the case for the investment, the greater the risk that the project turns out to be a white elephant. More generally, limited absorptive capacity could constrain the growth dividend of additional public investment projects, especially in periods of rapid acceleration of public investment (Presbitero 2018)—increasing the likelihood that the government later runs into debt-servicing difficulties (Case Study 3.1).

There are other instances where the government might also be acquiring assets and issuing debt to finance its purchases. One example is the issuance of external debt to finance the accumulation of foreign exchange reserves (which provide valuable FX liquidity during sudden stops or export shortfalls). Another example is financial sector bailouts that expand the government's balance sheet (Reinhart and Rogoff 2009; Laeven and Valencia 2013; Amaglobeli et al. 2017). When governments need to recapitalize the banking system, they acquire a financial asset (the equity stake in the bank), which they typically finance by issuing debt (in fact, the recapitalization often takes the form of a government bond). In this case we potentially have several arguments that justify these decisions. Stabilizing the financial sector can lead to a reduction

¹⁴ Mauro (2011) surveys fiscal adjustment episodes by comparing ex-post outcomes with ex-ante plans.

¹⁵ If the government were to buy this service from the private sector (i.e., the roads are built with private investment and then its services sold to the government) this would spread the spending naturally over time without the need for deficits.

in the severity of the decline of GDP. Not only will this be welfare enhancing, it will also raise tax revenues for the government. In addition, the assets acquired might be undervalued by the market because of fire sales or panic. In this case the assets could deliver a return that will partly or fully compensate the financial costs of issuing debt. A recent study on the fiscal costs of systemic banking crises over the period 1970–2011 shows that the median cost of direct government intervention in the banking sector amounted to about 7 percent of GDP (factoring in the indirect fiscal costs raises the impact of banking crises to 12 percent of GDP, International Monetary Fund (2015)).

A final case where deficits can be justified even if the government is not acquiring a physical or a financial asset is to support structural reforms. The political economy of structural reforms means that it is very difficult to find support for them in democratic environments (Fernandez and Rodrik 1991). This difficulty is the result of the uncertainty about who are the winners and the losers of those reforms. One way to ensure support would be through spending or tax measures that make those benefits immediate and reduce the potential uncertainty about the long-term benefits. In this case the government is investing in the necessary credibility needed to deliver structural reforms that will produce a social and even financial return in the long run (Banerji et al. 2017).

D. Asset management and government debt as safe asset

In Section 2.C, we emphasized the importance of looking at the asset side of the government's balance sheet to understand the existence of debt. The liability side may also be important. For instance, public debt may be issued not to meet the government's borrowing needs but to provide financial markets with risk-free instruments. Indeed, at the national level, government debt markets have often played a key role in developing nascent financial markets, including extending the yield curve to longer maturities and providing a benchmark.¹⁶ International Monetary Fund (2012) highlights the overall benefits of safe assets. Abbas and Christensen (2010) show that moderate levels of non-inflationary government debt have a positive overall impact on economic growth. Gorton and Ordoñez (2013) analyze the benefits of government debt as a safe asset during crisis to show that within their

¹⁶ The government debt market ("consols") was instrumental in the growth of Britain's financial markets, including the stock exchange, money markets, etc.) see Michie (2001: chs 1 and 2).

model “The decline in output during a crisis is lower to the extent that there are more government bonds outstanding.”¹⁷

At the international level, there is a similar need for safe assets, and these assets are likely to be associated to one of the major reserve currencies (US dollar, euro, yen). In fact, the Global Financial Crisis—because of a combination of flight-to-safety and several sovereigns losing their AAA status—has resulted in a shortage of global safe assets with a variety of consequences (see Caballero et al. 2008; Gourinchas and Jeanne 2012; Brunnermeier et al. 2017, among others).

E. Dynamic inefficiency

Dynamic inefficiency—whereby the private sector cannot optimally provide vehicles to transfer wealth across generations—provides another potential rationale for government debt. In such an environment, issuing additional government debt is not only sustainable but also optimal (Blanchard 1985, 2019). For dynamic inefficiency to hold, it requires that the rate of return of an economy must be below its growth rate. Interest rates on government debt are often below GDP growth rates, but what matters is the rate of return on capital.¹⁸ In a seminal study, Abel et al. (1989) provided strong evidence for six advanced economies that the criterion for dynamic inefficiency was not met. However, recent decades have seen substantial reductions in real interest rates on safe assets, which suggests it could be worth revisiting their findings. Geerolf (2017), concludes that dynamic inefficiency cannot be ruled out for several advanced economies. But whether the evidence is sufficiently compelling to warrant a clear policy recommendation in some of these countries remains an open question (Blanchard and Summers 2017; Blanchard 2019).

3. Bad Reasons to Issue Debt

Budget deficits, and the resulting accumulation of debt, can be optimal during recessions or in the presence of exceptional events such as war, natural

¹⁷ Singapore is an interesting case of a government that has persistent surpluses but still issues debt to supply the financial system with a safe asset. Gorton and Ordoñez's (2013) results might not apply to countries that have difficulty financing large debts. As Jorda et al. (2011) show, countries that enter a financial crisis with high levels of debt have worse outcomes.

¹⁸ While observed interest rates are often somewhat below GDP growth rates, if that were true on a persistent basis, then the government would effectively not face an intertemporal budget constraint.

disasters, or financial crises. Borrowing may also be justified by the need to finance large investment projects—though there is only limited evidence of a link between increases in public debt and surges of public investment (Figure 3.2).

A benevolent social planner would borrow up to the point at which the social marginal cost of an additional unit of debt (this includes principal, interest repayment, and any possible externality brought about by higher debt levels) equals the social return of an additional unit of debt-financed government expenditure. Overborrowing refers to a situation in which the government borrows more than is socially optimal. Yared (2019) suggests that the accumulation of public debt in recent decades is due to overborrowing driven by political distortions which leads to time inconsistent preferences and a bias towards present consumption.

A. Why do governments overborrow?

Just as it is wrong to compare the behavior of the government with that of a household—because the government is a large player and its borrowing decisions can have important spillovers, positive and negative, on the economy—it is also wrong to assume that policymakers always try to maximize social welfare. While it is reasonable to assume that the decision of a household head to borrow aims at maximizing the household's welfare, a policymaker's decision to contract public debt may be less benign. In order to understand why sovereigns overborrow, it is necessary to move from normative to positive theories of public debt (Alesina and Tabellini 1992).¹⁹ The economics literature has emphasized four potential sources of excessive debt accumulation: (i) political budget cycles and rent seeking; (ii) intergenerational transfers; (iii) strategic manipulation; and (iv) common pool problems.

Political budget cycles and rent seeking

The literature on the political budget cycle suggests that politicians cut taxes and increase spending to increase the likelihood of being reelected. At the most basic level, the presence of a political budget cycle requires that voters suffer from “fiscal illusion.” Only voters who do not fully understand the intertemporal nature of fiscal policy may be tempted to vote for politicians

¹⁹ See Yared (2019), Alesina and Passalacqua (2016), and Battaglini (2010) for recent detailed reviews of the political economy of public debt.

who cut taxes or provide more public services without increasing taxes. In the traditional public choice literature, fiscal illusion is amplified by the asymmetric application of Keynesian stabilization policies, with policymakers happy to run budget deficits during recessions but less inclined to run surpluses in a period of rapid economic growth (Buchanan and Wagner 1977).

Political budget cycles models do not necessarily require voters to be irrational. For instance, Rogoff and Sibert (1988) develop a model in which the presence of fully rational but imperfectly informed individuals leads to a political business cycle because pre-electoral budget deficits are the only mechanism through which policymakers can signal their competence (the reason being that only competent politicians will be able to balance the budget after the election). Another implication of these types of models is that policymakers may engage in more visible, but not necessarily more efficient, types of public expenditure (Rogoff 1990).²⁰

Political business cycle models implicitly assume that policymakers want to remain in power. This may be because of ego-rents or because, by staying in power, they can implement their favorite policies. It is, however, also possible that policymakers want to be in power to extract resources from the economy. Yared (2010) studies the behavior of politicians who try to extract rents and need to decide whether to extract a limited amount of resources in each period or extract everything they can in one period and then lose power. One of the implications of the model is that a high level of debt reduces the politicians' incentive to extract the maximum amount of rent and makes her more likely to behave as a social planner.

Intergenerational transfers

Individuals can leave positive bequests to their offspring but private negative bequests cannot be enforced by law. But individuals who would like to leave a negative bequest can use public debt to redistribute resources from future to current generations. Cukierman and Meltzer (1989) use an overlapping generations model to study an economy with two types of individuals: citizens who would like to leave a positive bequest to their children and constrained citizens who would like to leave a negative bequest. The first group only cares about public debt through its effect on the economy. Bequest-constrained

²⁰ A somewhat different strand of literature studies the link between public debt and political actions that go beyond voting. Using insights from behavioral economics Passarelli and Tabellini (2013) suggest that a perception of unfairness may lead to costly riots and that, in order to prevent such riots, the government will borrow more than what would be optimal if the citizens had full information on the available resources. In this case, excessive debt accumulation is a second best optimum.

individuals, instead, would like to issue more debt because this relaxes their constraint. In such a set-up, the level of debt depends on the bequest constraint faced by the median voter.²¹

Other models that focus on intergenerational transfers include Tabellini (1991) who develops a model with defaultable debt and wealthy and poor voters. In this setting, higher levels of debt (up to a point) create an incentive to repay the debt by linking intergenerational with intragenerational transfers. Song et al. (2012), instead, study a model in which the young and the old have different preferences for public goods and taxation is distortionary. In this setting, the level of debt is determined by these preferences (that can vary across countries) and the political power of the two groups. Jackson and Yariv (2015) show that if there are two groups of individuals and one group (the old) cares less about the future than the other group (the young) a government that aggregates the preferences of these two groups may suffer from a present bias. Yared (2019) shows that theory is consistent with the fact that there is a positive cross-country correlation between the growth rate of public debt and aging of the population. It is worth noting that the standard social planner model would predict the opposite correlation.

Strategic manipulation

On February 18, 1981 President Reagan described his program for economic recovery in a joint session of the US Congress. Among the topics discussed in his speech, there was the high level of public debt, which was approaching \$1 trillion (this was total US Federal debt, Federal debt held by the public was about \$770 million or 25 percent of GDP).²² Eight years later, the US federal debt held by the public had surpassed \$2.1 trillion (a 100 percent increase in real terms) and reached 39 percent of GDP.

Why would a conservative like President Reagan accumulate so much debt, and why are large and persistent primary surpluses often associated with left-of-the center governments (Eichengreen and Panizza 2016)? Persson and Svensson (1989) show that, in the presence of two parties with different preferences for spending and taxation, left-of-the-center parties (which prefer more public goods at the cost of higher taxes) may decide to run budget

²¹ In the presence of imperfect capital markets individuals may prefer higher levels of debt to undo credit constraints faced by households. In such a set up a higher level of debt could be Pareto optimal and would not necessarily lead to any intergenerational transfer.

²² The US national debt is approaching \$1 trillion. A few weeks ago I called such a figure, a trillion dollars, incomprehensible, and I've been trying ever since to think of a way to illustrate how big a trillion really is. <http://www.presidency.ucsb.edu/ws/index.php?pid=43425>

surpluses so that the right-wing party will inherit a low level of debt and will not have a strong incentive to reduce public expenditure. Similarly, the right-wing party will increase the level of debt so that the left wing party will have to limit spending when in power.²³ In effect, debt is a state variable that the party in power can use strategically to constrain the actions of successor governments.²⁴

While the model of Persson and Svensson (1989) shows how debt can be used to influence the actions of successive governments, it does not necessarily lead to excessive debt accumulation because deficits by right wing governments are canceled with surpluses by left wing governments. Alesina and Tabellini (1990) develop a model in which political parties have preferences for different types of public expenditure and accumulate debt in order to constrain the choices of future governments. In this setting, the level of debt depends on the likelihood of being reelected. Governments which are sure to stay in power behave like a social planner and issue no debt. However, governments with low probability of reappointment will overborrow.

Common pool

Common pool problems originate from the presence of externalities that lead to the private benefit of an additional unit of public expenditure being different from the social marginal cost of funding it (Olson 1965 and Ostrom 1990). The presence of concentrated interests amplifies the common pool problem. When policy actions benefit a certain group and are funded with a general tax, the relatively small group of people who benefit from the policy will have strong incentives to lobby in favor of the policy (for a classic analysis of the role of pressure groups see Buchanan and Tullock 1962). The much larger, but dispersed, group of actors that bears the cost of this action will have weaker incentives to act against it.

Common pool problems may explain why fiscal adjustments based on spending cuts, albeit desirable, are often hard to implement. For instance, Mauro and Villafuerte (2013) show that, while almost 90 percent of fiscal adjustment plans implemented by EU countries envisaged large spending cuts partly compensated by lower taxes, the data reveal that expenditure cuts often did

²³ Müller et al. (2016) develop a similar model with similar implications (in normal times a left-of-the center government issues less debt because it wants to be able to implement countercyclical policies in bad times), but in this case the incentive of the right-wing government to issue debt does not depend on its likelihood of remaining in power.

²⁴ Papers that emphasize the strategic role of debt include Persson and Svensson (1989), Aghion and Bolton (1990), Alesina and Tabellini, (1990), Tabellini and Alesina (1990) and Lizzeri (1999).

not materialize and that this lack of expenditure cuts either resulted in smaller budget surpluses (or outright deficits) or was compensated by temporary measures aimed at increasing revenues. This is clearly suboptimal as there is ample evidence that expenditure-based fiscal adjustments are preferable and more likely to be long-lasting than revenue-based fiscal adjustments.

The exact way in which the common pool problem manifests itself depends on the institutional setting. There is a large literature in political science (dating back to Weingast et al. 1981 and Baron and Ferejohn, 1989) that models common pool problems and pork-barrel spending in the US Congress. However, common pool problems also apply to situations in which the budget law is prepared by the government and then sent to the legislative body for approval. In such a setting, it is possible to think of a strategic interaction between the Ministry of Finance, which worries about the overall budget constraint, and the spending ministries which are subject to pressure from different interest groups (Alesina and Perotti 1996). Hierarchical rules in which the Ministry of Finance first decides the overall budget envelope and then the line ministries decide on the allocation may help reduce excessive spending (more on this in Section 3.B below).

Although common pool problems may lead to overspending, it does not necessarily follow that they will result in excessive budget deficits and debt accumulation as the higher spending could be matched by higher taxes. If property rights are not well defined, however, and each group fears that any residual government asset will be appropriated by the other group, each group may find it optimal to demand large transfers and push the government to its borrowing limit (Tornell and Lane 1999 and Velasco 2000).²⁵

Political turnover amplifies common pool problems because if parties have different preferences for different types of public goods they will have an incentive to overspend on their favorite good when in power—the more so the lower the likelihood of being re-elected (Aguiar and Amador 2011). Empirically, Woo (2003) finds that budget deficits tend to be larger in countries characterized by deeper political cleavages and party fractionalization.

Common pool problems can also lead to overborrowing if legislators do not know whether they will be part of future governing coalitions. Battaglini and Coate (2008) show that adding uncertainty to a dynamic common pool model leads to two contrasting forces which unify the main findings of the normative literature on public debt (e.g., Barro 1979 and Aiyagari et al. 2002)

²⁵ Krogstrup and Wyplosz (2010) show that the presence of international externalities common pool problems can justify the presence of supranational debt ceilings.

with those of the positive literature that emphasizes the role of political failures (e.g., Alesina and Tabellini 1990). On the one hand, there is a self-insurance incentive: policymakers want to accumulate assets in order to insure against future shocks (as in Aiyagari et al. 2002). On the other hand, there is a political distortion: policymakers accumulate debt because they may not be part of future governing coalitions and higher levels of debt constrain the behavior of future policymakers as in the strategic models described above. When debt levels are low, political distortions dominate the self-insurance incentive and the government overborrows. As debt increases, the self-insurance motive becomes more important and fiscal policy becomes similar to the policy that would be chosen by a social planner (albeit with a higher equilibrium level of debt).²⁶

B. Controlling overborrowing

The economics literature identifies three possible avenues to limit overborrowing. The first focuses on the electoral system, the second on fiscal rules, and the third on budgetary institutions.

Electoral systems

Battaglini (2010) shows that a simplified version of the model of dynamic electoral competition, discussed in Battaglini (2014), yields the unambiguous prediction that proportional electoral systems suffer from a deficit bias compared to majoritarian electoral systems. This prediction is in line with a large number of papers that show that democracies with a proportional electoral system accumulate more debt than democracies with a majoritarian system (e.g., Roubini and Sachs 1989; Grilli et al. 1991).²⁷

A related literature that compares presidential and parliamentary democracies finds that the former tend to have smaller governments than the latter (and, within parliamentary democracies, majoritarian systems have smaller governments than proportional systems). The literature also finds that in parliamentary democracies increases in government spending during recessions

²⁶ This literature tends to study the bargaining process within a legislature that includes representatives from different districts. There are also papers that focus on the electoral process and study how different parties choose a policy platform with the objective of winning an election (Battaglini 2014 and Battaglini and Coate, 2008).

²⁷ The degree of proportionality is usually measured with the size of electoral district (Taagepera and Shugart 1989; Lijphart 1994).

are less likely to be reversed during economic expansions (Persson and Tabellini 2003, 2004). If taxes remain constant over the business cycle, this behavior may lead to a ratchet effect and to a deficit bias in parliamentary democracies.

Fiscal rules

Fiscal rules aim at addressing the time inconsistency problem and limit debt accumulation by imposing an upper limit on budget deficits. A government that implements a fiscal rule trades off a constraint on its own action (something it does not like) against a constraint on successor governments (something it does like). Fiscal rules have become increasingly popular: while in the mid-1990s there were fewer than twenty countries with a national or international fiscal rule, there are now nearly 100 countries that adhere to some type of fiscal rule.²⁸

The most extreme fiscal rule is the balanced-budget rule requiring zero deficits in every period. Such a rule may reduce welfare because it limits the government's ability to use countercyclical policies (or to smooth taxes).²⁹ A rule that aims at balancing the budget over the business cycle addresses this issue at the cost of being less transparent. Yared (2019) presents a detailed survey of these trade-offs by discussing the role of public information, the degree of enforcement (including the role of escape clauses), and the costs and benefits of rules based on specific targets (i.e., the total or primary deficits) vis-à-vis rules that concentrate on policy instruments (such as spending).

On empirics, there is a large literature on the effect of balanced-budget rules for subnational governments (especially US states see, for instance, Poterba 1996) as well as numerous studies of the fiscal rules adopted by many European countries. The results of this latter literature are mixed. On the one hand, Debrun et al. (2008) and Bergman et al. (2016) find that fiscal rules play a significant role in limiting budget deficits in European countries; on the other hand, Von Hagen (2006) suggests that the fiscal rules imposed by the Maastricht Treaty did not constrain the behavior of the largest countries in the euro area. The main challenge is to go beyond simple correlations and establish whether such rules have a causal effect on fiscal outcomes (Heinemann et al. 2018). Caselli and Wingender (2018), using an innovative

²⁸ For a recent discussion on fiscal rules see Eyraud et al. (2018). The IMF also maintains a comprehensive data set of fiscal rules. The data are available at: <https://www.imf.org/external/datamapper/fiscalrules/map/map.htm>

²⁹ Azzimonti et al. (2016) show that a balance budget rule is never welfare improving for economies with a positive level of debt.

identification strategy and a bunching estimation method, find that the Growth and Stability Pact has led to a bunching of fiscal deficits around the 3 percent Maastricht deficit ceiling.

Budgetary institutions

Preparing the budget is a complex exercise that involves several players within the government as well as interaction between the executive and the legislative. There is evidence that the institutions that regulate the preparation of the budget and guarantee its transparency have an impact on fiscal outcomes. In terms of budgetary process, hierarchical rules give more power to the ministry of finance, while collegial rules give more power to the spending ministries and allow the legislature to amend the budget. Hierarchical rules mitigate the common pool problem and are thus associated with smaller deficits and debt accumulation—albeit at the cost of democratic accountability (for surveys of the literature see Eichengreen et al. 2011; Hallerberg et al. 2009).

The transparency of the budget also matters. Rogoff and Sibert (1988) emphasize that imperfect information can lead to political business cycles and Milesi-Ferretti (1997) discusses how politicians who want to overborrow have incentives to window-dress their budget laws, even more so when the politicians are corrupt.³⁰ Standard strategies for manipulating the budget include keeping various items off-budget and adopting overoptimistic projections on either the state of the economy or on the effect of certain policies on tax revenues or expenditure.

Building on the intuition of Alesina and Tabellini (1990) and Rogoff and Sibert (1988), Beetsma et al. (2017) develop a model in which transparent budgets mitigate incentives to overborrow. This prediction is consistent with the empirical literature that finds that fiscal transparency is associated with lower levels of public debt (Alt and Lassen 2006; Alesina et al. 1999; Dabla-Norris et al. 2010).

C. The unexplained part of public debt

Thus far we have assumed that fiscal policy is the only driver of debt accumulation and that the stock of debt is equal to the sum of past deficits. However, debt accumulation is usually the sum of past deficits plus an unexplained

³⁰ Alesina and Cukierman (1990) show that politicians who favor policies which are different from those who would maximize their chances of reelection favor transparent budget procedures that do not reveal their preferences.

residual, sometimes referred to as the stock-flow reconciliation (or adjustment).³¹ In some cases, this residual can be very large.

Consider the case of Uruguay. At the end of 2001, its net debt-to-GDP ratio was 35 percent (gross debt was 55 percent of GDP) and at the end of 2002 it had reached 76 percent (gross debt 106 percent). Yet over 2002 Uruguay's total budget deficit was only 3.7 percent of GDP; the increase in debt was 17 percentage points of GDP higher than the deficit. The case of Argentina is even more striking. At the end of 2001, Argentina's gross public debt was 49 percent of GDP, by the end of 2002 it had reached 152 percent of GDP while the 2002 public deficit was recorded at just above 2 percent. Debt grew 101 percentage points of GDP more than the deficit!

Campos et al. (2006) show that debt explosions—well beyond recorded deficits—are not limited to the few cases described above, and Cafiso (2012) shows that this phenomenon is not limited to emerging market countries and that the stock-flow reconciliation accounted for nearly one-third of public debt growth in EU countries over 2008–10.

The main drivers of this “unexplained” part of debt are balance sheet effects linked to the presence of foreign currency debt (Eichengreen et al. (2005); currency depreciations in the presence of dollar debt explain the debt explosions of Argentina and Uruguay mentioned above), banking crises (Amaglobeli et al. 2017), hidden deficits (and thus borrowing) driven by governments' incentives to misreport public expenditure (Weber (2012) shows that more transparent budgets are correlated with lower stock flow adjustments), and all sorts of contingent liabilities linked to implicit subsidies and public guarantees.

While some of these fiscal risks are unavoidable, policymakers could implement policies aimed at mitigating them. For instance, a safer (from the point of view of the borrower) debt structure could mitigate some of the risks linked to balance sheet effects, and contingent debt instruments, such as GDP indexed bonds, could reduce fiscal costs at a time of crisis (Borensztein and Mauro 2004). The question is why these safer debt instruments are so seldom used.

Part of the answer is that local currency or indexed debt tends to be more expensive than what a fair insurance would predict—both because of market failures and because of the incentives (highlighted by Calvo 1988 and Tirole 2003) associated with local currency debt. However, political

³¹ The name derives from the fact that this residual entity reconciles the deficit, which is a flow variable with debt, which is a stock variable.

failures also play a role as domestic currency debt and contingent instruments more generally work as an insurance policy: their cost must be paid upfront but their payoff may not occur until years later (or never occur). As such they tend to be poorly understood by the public and may not be desirable for policymakers who may be afraid to pay the cost of an instrument that might end up benefiting their successors (for a detailed discussion see Borensztein et al. 2006).

4. Debt, Growth, and Investment

Regardless of the motives to borrow, high levels of government debt can have adverse effects on the economy, limiting policymakers' capacity to run countercyclical fiscal policy, crowding out private sector investment, tightening credit constraints, and creating the expectation of higher future distortionary taxation. Conversely, public borrowing—even if it results in a higher debt ratio—can be good for growth if used for productive investment or demand stimulus during downturns (see above, Section 2.C). Nevertheless, the increase of investment spending must be balanced against considerations of debt sustainability—a particularly pressing issue in many developing countries that need large investments to realize the 2030 Sustainable Development Agenda (see Case Study 3.1).³²

If Ricardian Equivalence does not hold, the decrease in public saving associated with debt accumulation will not be fully compensated by higher private saving and will lead to a lower stock of capital and thus higher interest rates and lower economic growth (Diamond 1965; Blanchard 1985). This is the classic crowding-out effect, which can also be obtained within a simple IS-LM model. Using the back-of-the envelope calculations of Elmendorf and Mankiw (1999) and Panizza and Presbitero (2013) show that this effect is not quantitatively large.³³ The crowding-out effect of public debt could, however,

³² However, the empirical literature on the growth effects of public investment is not conclusive. While there is evidence of a positive growth effect of debt-financed public investment in advanced economies (Abiad et al. 2016), a study of several episodes of public investment booms casts doubts on this positive narrative and suggests that the growth impact could be very limited, at the cost of larger ex-post public debts (Werner 2014).

³³ By assuming that an annual real GDP growth is 3 percent and a convergence speed of 2 percent, Panizza and Presbitero (2013) show that the steady-state change in output computed by Elmendorf and Mankiw (1999) implies that increasing debt by 50 percent of GDP would reduce annual GDP growth by approximately 10 basis points in the first 20 years. In a three-asset setting, Friedman (1978) argues that higher government debt can “crowd-in” private capital accumulation, depending upon the substitutability between assets in financial portfolios.

become large if government debt results in tightening credit conditions faced by private firms (Broner et al. 2014). The recent evidence of the European sovereign debt crisis has shown that the expansion of the share of government debt held by the banking sector in times of crisis crowds out private sector lending (Altavilla et al. 2017; Becker and Ivashina 2018).

High public debt can also have a negative effect on economic activity as investors anticipate lower real returns in the future—whether as a result of confiscation, inflation, or higher taxes (Cochrane 2011). Amidst sustainability concerns, moreover, rising debt can result in widening spreads, which are then transmitted to the rest of the economy, raising the cost of borrowing for the private sector (Codogno et al. 2003; Laubach 2009; Baum et al. 2013).³⁴

Governments generally react to increasing public debt with austerity measures, running smaller deficits or larger surpluses (Bohn 1998; Mendoza and Ostry 2008; Ghosh et al. 2013; Mauro et al. 2015). In this respect, high levels of public debt may also have a negative impact on growth as they could limit a country's ability to conduct countercyclical policies and, possibly, lead to self-defeating austerity policies thus increasing output volatility and reducing economic growth. As the relationship between the level of debt and the ability to conduct countercyclical policies is also dependent on the composition of public debt (Hausmann and Panizza 2011; De Grauwe 2011), countries with different debt structures may start facing problems at very different levels of debt.

A. What do the data say?

The rapid increase in public debt in the aftermath of the Global Financial Crisis sparked a large empirical literature on the growth effects of public debt. An influential paper by Reinhart and Rogoff (2010a) uses data for twenty advanced economies over 1946–2009 to plot average GDP growth for different levels of debt and shows that average and median growth is substantially lower when public debt surpasses 90 percent of GDP. This finding is robust to using more recent data from the newly available Global Debt Dataset (Mbaye et al. 2018), with average (median) growth declining from 3.7 percent when the debt-to-GDP ratio is less than 30 percent, to 2.6 (2.7) percent when the debt ratio is between 30 and 60 percent, and to 1.2 (1.6) percent when debt

³⁴ Indeed, the debt overhang literature (Krugman 1988; Sachs 1989; Aguiar et al. 2009) suggests that there is a level of debt at which these growth effects are so large that debt relief would benefit both debtors and creditors.

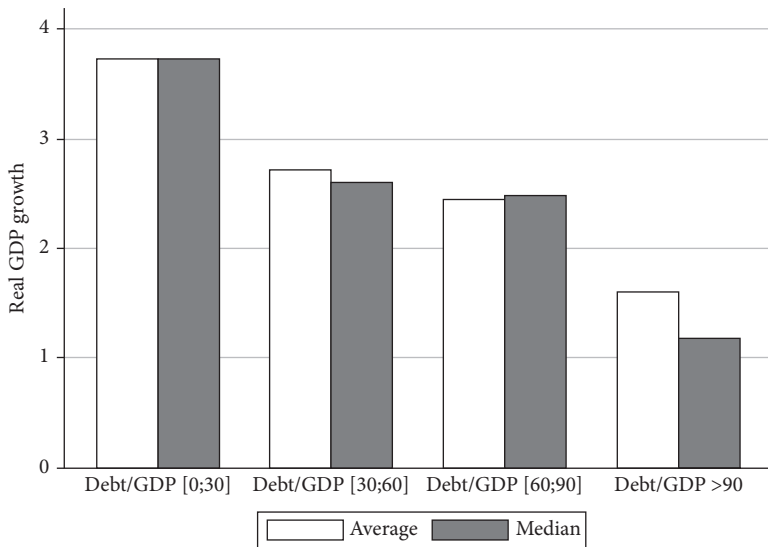


Figure 3.3 Government debt and growth, selected advanced economies; 1960–2016

Notes: The sample includes twenty advanced economies as in Reinhart and Rogoff (2010a, Figure 2): Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, the United Kingdom, and the United States. Data refer to central government debt, apart from the Netherlands, for which general government data have been used, because of data availability.

Source: Global Debt Dataset (Mbaye et al., 2018) and World Economic Outlook.

surpasses 90 percent of GDP (Figure 3.3). However, these differences are smaller when looking at a large sample of 119 low- and middle-income countries, where average growth declines from 4.4 percent for low-debt countries to 2.6 percent in high-debt (above 90 percent) countries (Figure 3.4).

Reinhart and Rogoff's (2010a) article was followed by a large number of papers aimed at assessing whether the correlation between debt and growth was robust to controlling for other variables in a formal regression set-up, and to instrumenting public debt to assess its causal effect on economic growth. Another set of papers focuses on non-linearities allowing for a non-arbitrary debt bracket.

By and large, there is strong evidence that public debt is negatively correlated with future economic growth. We corroborate the negative correlation between debt and growth by plotting current debt level and future growth and showing that, controlling for year- and country-fixed effects, there is a strong negative correlation between the debt-to-GDP ratio in year t and real GDP growth between t and $t+5$ (Figure 3.5). This negative correlation does not necessarily imply that high levels of debt *cause* lower growth. Indeed, the negative

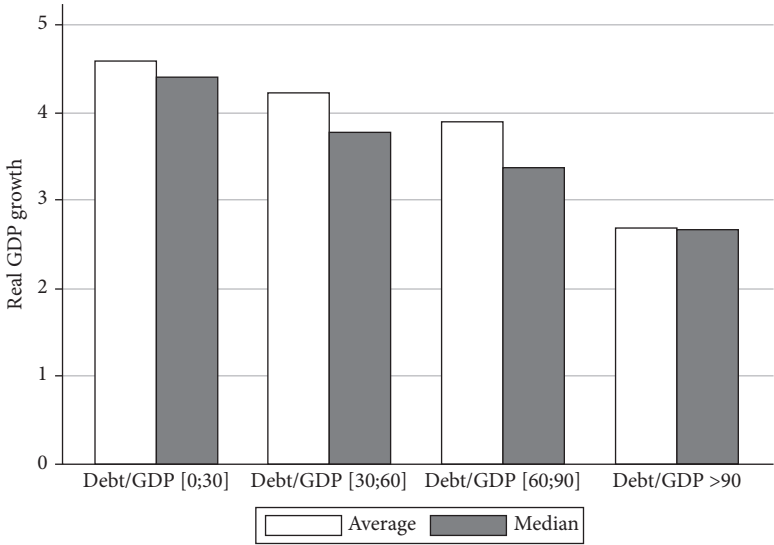


Figure 3.4 Government debt and growth, low- and middle-income countries; 1960–2016

Notes: Data refer to central government debt. The sample includes 131 low- and middle-income countries. Data refer to central government debt.

Source: Global Debt Dataset (Mbaye et al., 2018), World Development Indicators and World Economic Outlook.

correlation between debt and growth could be driven by unobservable omitted variables that are jointly correlated with debt and growth or by reverse causality. Slow economic growth, in fact, is an important factor explaining the rise of the public debt-to-GDP ratio (see, for instance, the Italian experience discussed in Case Study 3.2). This is not only because of the direct effect of growth on the denominator of the debt ratio, but also because the primary surplus depends on economic growth. In fact, absent any policy measure, low growth acts as a constraint to public revenues, while expenditures increase in line with inflation, leading to a larger deficit and a rising debt (Mauro and Zilinsky 2016).³⁵ There is also a third factor that goes beyond the mechanical impact of growth on GDP and revenues. Mauro et al. (2015) show that permanent growth slow down is often associated with increasing debt because policymakers often confuse changes in trend growth with temporary slowdowns and try to use expansionary fiscal policy to address a structural problem.

³⁵ Mauro and Zilinsky (2016) show that the difference in growth rates between Ireland and Italy after the global crisis is the main driver of the diverging debt trajectories. More generally, they show that economic growth is a key factor to explain the debt evolution in most advanced economies since the 1950s.

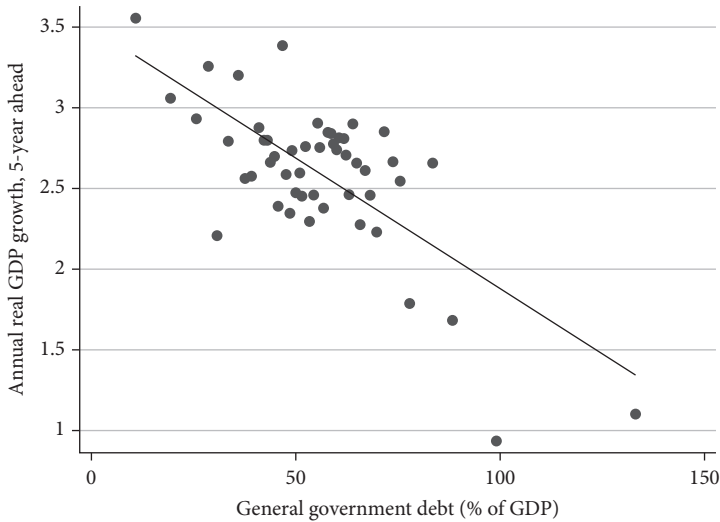


Figure 3.5 Government debt and subsequent GDP growth, selected advanced economies; 1960–2016

Notes: A regression of the annual real GDP growth between $t+5$ and t against the ratio of general government debt over GDP at time t , controlling for year and country fixed effects, gives a coefficient on the debt variable of -0.016 (p -value of 0.001), meaning that 10% higher debt-to-GDP ratios are associated with 0.2% lower future growth over five years. To generate the binned scatterplot, starting from the sample of nineteen OECD economies (data on general government for New Zealand are not available), the annual real GDP growth between $t+5$ and t (y -axis) and the ratio of general government debt over GDP at time t (x -axis) are regressed against year and country fixed effects. Then, the x -residuals are grouped into fifty equal-sized bins, then the chart plots, for each bin, the mean of the annual real GDP growth between $t+5$ and t , within each bin, holding the controls constant. The line is the linear fit of the OLS regression of the y -residuals on the x -residuals. The number of observations is 923.

Source: Global Debt Dataset (Mbaye et al., 2018) and World Economic Outlook.

Case Study 3.2 The evolution of Italian public debt after World War II

Italy has the fourth largest stock of public debt in the world, the second highest debt-to-GDP ratio in the G7 group of advanced economies, and the highest debt service ratio in the G7.

Italian public debt stood at 74 percent of GDP at the end of World War II in 1945, but dropped to 24 percent of GDP by 1947.¹ The main driver of this rapid debt reduction was high inflation (20 percent in 1946 and 62 percent in 1947) and the corresponding negative real interest rates (the

¹ All the data refer to gross debt. In Italy the difference between gross and net debt is not very large. For instance, WEO data for 2016 report a gross debt of 131% of GDP and a net debt of 119% of GDP.

Continued

Case Study 3.2 *Continued*

stock of debt still carried single digit interest rates). From this point on, it is possible to identify seven phases in the behavior of the Italian public debt: (i) a moderate increase (to 34 percent of GDP) during the postwar reconstruction period; (ii) a slight decrease (to 27 percent of GDP) over 1955–64; (iii) a rapid increase to (to 56 percent of GDP) over 1964–75; (iv) a period of relative stability in the second half of the 1970s; (v) a rapid increase over 1980–94, with debt peaking at 120 percent of GDP in 1994; (vi) a consolidation phase over 1995–2007, with debt bottoming at 103 percent of GDP in 2004; and (vii) a rapid increase after 2008, with debt surpassing 130 percent of GDP in 2016.

These different phases can be explained by different economic and political events. The increase in debt during the reconstruction period was driven by massive public investment, which was needed to rebuild and modernize Italian infrastructures (by the early 1960s, public investment still accounted for more than 20 percent of total public expenditure). Over 1955–64, debt reduction was driven by a combination of rapid economic growth and small overall budget deficits (composed of small primary surpluses that almost fully balanced interest payments; in the postwar period Italy never ran an overall budget surplus). In the second half of the 1960s, Italy started running increasingly larger primary deficits, hovering at around 2 percent GDP in the second half of the 1960s and going well above 4 percent of GDP in the 1970s. These large budget deficits are partly explained by the political economy theories illustrated in Section 3.3 as they were associated to a period of often short-lived coalition governments, a strengthening of the opposition Communist Party (which in late 1960s and early 1980s was receiving more than 30 percent of Italian votes), and a period of political and labor tensions that culminated in the “Hot Autumn” of 1969–70.²

The interesting fact is that while primary deficits led to a debt explosion in the second half of the 1960s and early 1970s, even larger primary deficits had almost no impact on debt in the second half of the 1970s. The explanation has to do with the conduct of monetary policy which, by the late 1970s was mostly driven by the need to finance growing deficits. Debt monetization

² The term “Hot Autumn” denotes a series of large strikes in the main industrial cities of Northern Italy.

led to high inflation and, with the help of some financial repression, negative real interest rates, which kept debt under control over 1973–80.³

The situation changed when, in 1981, the “divorce” between the Bank of Italy and the Treasury prevented the central bank from monetizing the deficit. The divorce led to a rapid reduction of inflation and a sudden increase of real interest rates.⁴ The conquest of fiscal dominance, however, was not followed by fiscal reforms, and Italy kept running primary deficits until 1991. The combination of prudent monetary policy and large primary deficits led to the explosion of public debt over the 1980s and early 1990s. Starting from 1991, Italy began running primary surpluses. However, with high real interest rates debt kept growing until 1994. In the first half of the 1990s, interest payments absorbed more than 20 percent of total public outlays (in 1992 Italy ran a primary surplus of 1.8 percent of GDP but the overall budget deficit was above 10 percent of GDP).

Starting in 1994, a combination of substantial primary surpluses and decreasing real rates lead to a process of debt reduction. This process of fiscal consolidation, driven by higher revenues (revenues reached 47 percent of GDP in 1997, partly due to special “below the line” operations) and unchanged primary expenditure (at about 41 percent of GDP), slowed down over 2000–05. Primary surpluses went from the 4–6 percent range of the late 1990s to a 1–3 percent range; as a consequence, the debt-to-GDP ratio started growing again in 2005–06. There was a brief moment of consolidation in 2007 immediately interrupted by the explosion of the global financial crisis in 2008/2009. The first half of the new millennium was thus a missed opportunity for further reducing public debt, and Italy entered the global financial crisis with a level of debt well above 100 percent of GDP.

The post global financial crisis period was characterized by fiscal restraint (with Italy running a small primary deficit in 2009 and 2010 and primary surpluses well above its European counterparts in the remaining years), but with a contracting economy, which lead to a rapid increase in the debt-to-GDP ratio. During the crisis, the high level of debt associated with past fiscal profligacy constrained Italy’s policy response and possibly contributed to magnifying the crisis. In this sense, the high level of inherited debt may have a led to suboptimal macroeconomic policies with a negative effect on Italy’s GDP growth during the crisis—and, correspondingly, worsening debt dynamics.

³ Consumer price inflation was almost always above 15% over 1974–82 (it was 12% in 1978) and peaked at 21% in 1980.

⁴ Inflation went from 21% in 1980, to 9% in 1985, 5% in 1987, and 2% in 1997.

Thus, establishing whether debt has a *causal* effect on growth requires an instrumental variable or a natural experiment that allows the researcher to isolate exogenous changes in public debt. In the presence of persistent variables like the debt-to-GDP ratio, the standard approach of using past values of the variables of interest as instruments does not solve the identification problem (Reed 2015; Bellemare et al. 2017). Panizza and Presbitero (2014) propose a strategy that uses valuation effects brought about by the presence of foreign currency debt as an exogenous driver of the change in public debt and find that public debt has no effect on future growth. One problem with this approach is that in their sample of advanced economies the share of foreign currency-denominated debt is relatively small, and hence the instrument is not very strong. Another way to achieve identification is to move from macro to micro data. Huang et al. (2017, 2018) match firm-level balance sheets with data on either public debt across a sample of sixty-nine countries or local government debt across 270 Chinese cities to show that government debt tightens financing constraints for private sector manufacturing firms. In a similar vein, Croce et al. (2019) identify a different channel through which debt can affect productivity and growth showing that, in the United States, higher government debt increases the cost of capital and has a negative effect on investment by R&D-intensive firms. There is, however, a trade-off between identification and the ability to assess the macroeconomic effects of debt accumulation. While firm-level analysis allows precisely testing one channel through which debt may have a negative effect on growth, it “hides” the potential macroeconomic links between debt and growth. For instance, it is possible that higher levels of debt increase investment for all industries and firms considered by Huang et al. (2017, 2018), but that investment increases less for credit-constrained firms.

Besides studying the average correlation between debt and growth, the economics literature also seeks to identify possible non-linearities and threshold effects. Some analyses indicate that the debt trajectory can have more important consequences for economic growth than the level of debt-to-GDP itself (Pescatori et al. 2014; Chudik et al. 2017), in line with recent evidence on how public debt could affect debt sustainability and market access (Bassanetti et al. 2019).

Moving to the presence of debt thresholds, the notion that there is a non-linearity in the debt–growth relationship and that this non-linearity is at a specific value of the debt-to-GDP ratio—often taken to be 90 percent—has become popular.³⁶ However, assessing non-linearities is complicated by

³⁶ Reinhart and Rogoff (2010a, 2010b) did not explicitly suggest the presence of discontinuities when debt reaches a certain level. Their view is that they “do not pretend to argue that growth will be

lack of statistical power due to the limited number of observations above the relevant threshold, and it is possible that the results of the literature are driven by the imposition of some parametric approach and on a few outliers.³⁷ Moreover, this literature imposes common coefficients and thresholds across countries, while the data suggest that there is substantial heterogeneity especially when looking at larger samples, which pool together developing and emerging economies as well (Eberhardt and Presbitero 2015; Chudik et al. 2017). Consider, for instance, Figure 3.6, which plots the outcome of a

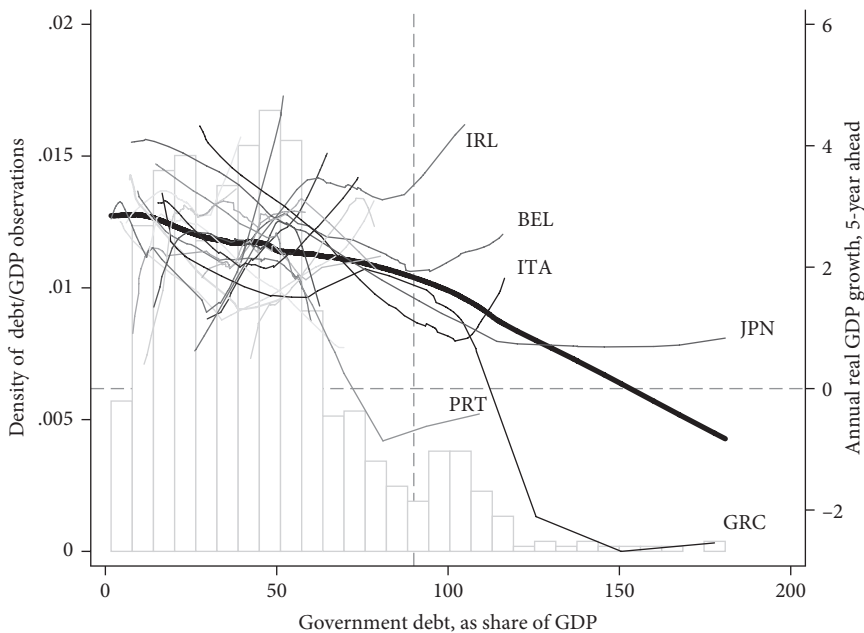


Figure 3.6 Non-linearities and heterogeneity in the debt–growth relationship

Notes: The solid black line plots smoothed values of the locally weighted regression of the annual real GDP growth between $t+5$ and t against the ratio of general government debt over GDP at time t for the whole sample. The thin lines plot the same smoothed values for single countries. The histogram shows the density distribution of the ratio of general government debt over GDP (x-axis). The sample includes twenty advanced economies as in Reinhart and Rogoff (2010a, Figure 2): Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, the United Kingdom, and the United States. Data refer to central government debt, apart from the Netherlands, for which general government data have been used, because of data availability.

Source: Global Debt Dataset (Mbaye et al., 2018) and World Economic Outlook.

normal at 89% and subpar (about 1% lower) at 91% debt/GDP any more than a car crash is unlikely at 54mph and near certain at 56mph.”

³⁷ The evidence of the actual presence of a common debt threshold in these studies is weak. See Panizza and Presbitero (2013) for an overview and Ash et al. (2017) for a replication of some of the

non-parametric regression based on a sample of twenty advanced economies over the period 1960–2016 and shows that (i) the average negative correlation between debt and future (5 years ahead) growth hides a large degree of heterogeneity across countries, and (ii) while the relationship between debt and growth is nonlinear there is no common threshold beyond which an increase in debt is associated with a growth slowdown.

One reason for the presence of country-specific thresholds is that the level at which public debt becomes “too high” must depend on country characteristics. For example, in the context of sovereign default, Reinhart et al. (2003) classified countries into clubs and “debt intolerance” regions, which depend not only on borrowers’ debt levels, but also on their credit and inflation history. Likewise, Ghosh et al. (2013), in calculating fiscal space, find that governments’ debt-sustainability thresholds depend on their historical track record of fiscal adjustment in response to rising public debt. Alternatively, Eichengreen et al. (2005) emphasized the role of debt composition. In the debt and growth literature, Kourtellis et al. (2013) explicitly modeled the possibility of different regimes depending on a large set of country characteristics and find that only when institutions are below a certain level does higher debt translate into lower GDP growth. As countries with poor institutions also have higher debt levels, these results provide a mechanism to interpret (and are consistent with) the general finding of a negative relationship between debt and growth. Specifically, countries with low-quality institutions may be more inclined to the political budget cycle and less able to control overborrowing. In addition, those countries could have a higher propensity to finance government consumption rather than productive investment, leading to higher debt and lower growth.

Other authors have looked at the dynamics between debt and growth from an historical perspective. Esteve and Tamarit (2018) focus on the Spanish economy for the period 1851–2013 and find some support for a negative relationship between public debt and growth, but no clear evidence of a debt threshold. Balassone et al. (2013) consider the experience of Italy since its unification in 1861 and find that when debt exceeds 100 percent of

most widely cited studies. For instance, Woo and Kumar (2015) run a simple growth model interacting the debt-to-GDP variable with three dummies for ratios: (i) below 30 percent, (ii) between 30 and 90 percent, and (iii) above 90 percent. In 2 (out of 4) specifications of their Table 5, they find that the coefficient of the debt ratio is negative and significant when larger than 90 percent, but this coefficient is lower than (equal to) that for debt between 30 and 90 percent in the OLS (GMM) estimates. In other words, they cannot test that the *correlation* between debt and growth is statistically higher when debt is larger than 90 percent of GDP. Checherita-Westphal and Rother (2012, Table 3), instead, run a quadratic model and report the confidence intervals of the turning point, which is 49–119 percent of GDP.

GDP its negative effect on growth becomes stronger. However, Eberhardt (2019) challenges this conclusion and, adopting a more flexible framework and data over more than two centuries for Great Britain, Japan, Sweden, and the United States, finds no evidence for any long-run non-linear relationship between debt and growth.

Overall, our reading of the empirical literature is that, at least in advanced economies, there is a negative correlation between public debt and subsequent economic growth but no convincing evidence of *causality*: high debt and low growth may just reflect a weak macroeconomic framework, which is driving both aggregates. A major complicating factor in any empirical analysis is that not all debts are equal: factors such as what the debt was used for, who holds it, its currency composition and maturity are all likely to affect any impact on future growth. While it is widely recognized that these should be taken into consideration (Eberhardt and Presbitero 2015; Chudik et al. 2017), the lack of data and of consistent cross-country definitions precludes most empirical analysis (Panizza and Presbitero 2013). Ultimately, the relationship between the accumulation of public debt and subsequent growth performance is likely to be highly complex, two-way, and country-specific. Some six years after Reinhart et al. (2012: 80) we still agree with them that the “endogeneity conundrum has not been fully resolved”.

Finally, it bears emphasizing that even if it is true (in a causal sense) that “debt is bad for growth” it does not necessarily follow that governments should pay down the existing debt (Ostry et al. 2015). In terms of social welfare (i.e., the distortionary cost), it may be more costly to pay down the debt than to live with it (provided, of course, the government does not face a funding crisis). In steady-state, this result follows directly from tax smoothing. Unless taxes are set to just service the debt indefinitely, they will either have to be increased in order to maintain sustainability against a growing debt, or they will have to be decreased once the debt has been repaid—either violates the principle of smoothing taxes to minimize the distortionary costs. Interestingly, the result also holds out of steady-state—at least for an important class of utility functions (i.e., iso-elastic). This is because, even though the presence of distortionary taxes implies wedges between private and social marginal products and rates of substitution, the market interest rate equals the discount rate of a benevolent government (i.e., that seeks to maximize the representative agent’s utility).³⁸ The government can choose to pay down \$1 of domestic debt today at a certain distortionary cost.

³⁸ See Chari et al. (1994) for an analogous result.

Or it can wait till tomorrow, when the debt and the cost will have grown by $(1+r)$, the market interest rate. But the government discounts the future at precisely $(1+r)$, so it is indifferent between paying down the debt today or tomorrow. Since the same argument holds across all periods, the steady-state result—that it is optimal to just live with the inherited debt—obtains even out of steady state.

5. Concluding Remarks

Governments issue debt for a variety of reasons—both good and bad. Among the good reasons are intertemporal tax smoothing, fiscal stimulus during economic downturns, and asset management, including providing financial markets with safe assets. While such motives can explain some of the increases in public debt—in particular, after wars or major financial crises—they cannot plausibly account for all of the observed changes. The correlation between public investment and public borrowing—supposedly a major non-wartime motivation for issuing debt—is surprisingly weak. Indeed, the behavior of governments is sometimes quite at odds with these theories. A notable example is the build-up of public debt in many advanced economies during the early 2000s, when the world economy was booming, and the looming prospect of aging-related costs should have spurred public saving.

Counter-cyclical fiscal policies with implementation delays and forecast biases might be part of the explanation for the upward trend in public debt in many advanced economies. But a full accounting needs to go beyond purely economic rationales and consider social, political, and institutional factors that might be at play. Politicians pursuing their own self-interest and seeking to maximize their chances of re-election may engage in a political business cycle that results in debt rising over time. Strategic manipulation whereby the party in power seeks to circumscribe its (possible) successor's ability to spend public funds by deliberately running up public debt will likewise result in a positive debt bias. And common pool problems, which result in the private benefit of an additional unit of spending exceeding the social marginal cost of funding this extra unit of expenditure, provide a third political economy explanation. More generally, where the “safety-valve” of inflation is unavailable (e.g., under a currency board regime or membership in a monetary union), competing demands by different socioeconomic groups is often (temporarily) resolved through rising public debt.

But why does overborrowing matter? And what can be done about it? Other chapters in this volume explore some of the consequences of excessive

government borrowing—including debt sustainability problems and possible crises. Even in the absence of crises, however, public debt can be costly. In welfare terms, the cost of public debt is the present discounted value of distortions associated with the taxes necessary to service that debt. Empirically, there is a negative relationship between public debt and output growth. The jury is still out on whether that relationship is causal—higher levels of public debt impeding growth—and in reality, the answer must depend on what the debt was used to finance, how it is expected to be repaid or serviced, and a host of other country-specific factors.

As to measures that democracies can take to limit overborrowing, the literature has identified three key avenues: electoral systems, fiscal rules, and budgetary institutions. While their effectiveness will depend on country circumstances, all imply some trade-off between the flexibility to respond to shocks and to issue debt for good economic reasons and the need to discipline policymakers from borrowing excessively.

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Debt Sustainability

*Xavier Debrun, Jonathan D. Ostry, Tim Willems,
and Charles Wyplosz*

1. Introduction

Why does Japan defy gravity with gross public debt levels above 200 percent of GDP and others default on a considerably smaller stock of obligations (e.g., 30 percent of GDP in Ukraine in 1998)? This is an example of the vexing question of debt sustainability that this chapter seeks to answer. Doing so requires us to tackle at least four different difficulties:

First, is the *definitional* challenge. Theory generally equates public debt sustainability with government solvency (i.e., the ability for the public sector to honor all its future financial obligations). However, theoretical clarity does not always translate into operational convenience, in part because sustainability is an inherently forward-looking concept, and, thus, an informed judgment on a known unknown. Thus, practitioners have been struggling to give a concrete meaning to the very notion of sustainability.

Second, standard macroeconomic analysis operates under the presumption that the government is solvent. It seems clear, however, that the benefits of default may in some cases exceed the costs, at least ex-ante, putting into question the *credibility* of commitments to always repay obligations in full. The very risk of default brings market beliefs into the picture, and with them, the issue of self-fulfilling prophecies whereby mere liquidity crises triggered by senseless panic can lead otherwise solvent governments to default.

Third, there is the operational challenge of modelling *uncertainty*. The evolution of public debt reflects a broad array of shocks hitting the public sector balance sheet. These range from unexpected policy changes to economic and financial disturbances that can depress government revenues, raise financing

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costs, or lead to the realization of contingent liabilities. From an operational perspective, analysts must balance the importance of forming a comprehensive view of the relevant risks to debt sustainability with the need to preserve technical tractability and transparency in their assessment. This explains why extensive stress tests and probabilistic models feature prominently in modern toolkits for debt sustainability analysis.

Fourth, not all debts are born equal. Some are more prone to rollover and *liquidity* risks than others. The currency composition (local vs. foreign), maturity structure (long- vs. short-term), and ownership of the debt (resident vs. non-resident) matter a great deal because they directly affect exposure to adverse shocks. The type of creditor (private investors, banks, official institutions, ...) and debt contract (traded bonds, bank loans, official loans at a subsidized interest rate, ...) must also be taken into account when assessing sustainability.¹

The aim of this chapter is to survey the knowns and unknowns of debt sustainability, including the range of tools at our disposal to understand vulnerabilities and inform what will always remain a difficult judgment call under considerable uncertainty. The chapter builds around the nexus between fiscal policy behavior and the determinants of gross public debt dynamics (mainly interest rates and growth), showing that debt sustainability is as much a political issue as an economic one. The implied complexity has prevented the emergence of a holistic, consistent, and broadly-accepted framework for practitioners, and we do not embark on the impossible mission to build such a framework. Instead, we take the more modest approach to review some of the key economic principles and statistical methods that form today's leading practice in debt sustainability assessments.

The chapter is structured as follows. Section 2 defines debt sustainability, reviewing the basic concepts such as solvency and the deterministic arithmetic of the government's budget constraint. In Section 3, we discuss quantitative assessments of government credibility, exploring the reasons why a government may find itself to be either unable or unwilling to meet its obligations. The notion of debt limit receives particular attention. Section 4 introduces the common tools to capture uncertainty. It looks into the main sources of uncertainty surrounding debt dynamics and shows how they can be incorporated in sustainability assessments. As solvency concerns (founded or not) usually erupt in the form of sudden interruptions in short-term financing, Section 5

¹ A case in point is the specific debt sustainability framework applied to low-income countries, as these tend to rely mostly on official financing at concessional terms.

discusses ways to include liquidity considerations in sustainability assessments. Section 6 explores several issues that may gain greater prominence in the future, including the role of specific monetary regimes (currency union, reserve currency issuer), the persistence of low interest rates, and the growing interest in broader views of sustainability reflecting the entire public sector balance sheet. Section 7 concludes.

2. Defining Sustainability

Debt sustainability perfectly illustrates the difficulty of deriving simple operational definitions from well-defined economic concepts. A broad consensus exists to consider public debt as sustainable when the government has a high probability of being solvent—that is, *able to honor its current and future financial obligations*—without having to resort to unfeasible or undesirable policies (see, e.g., IMF 2013). However, because solvency boils down to a mere prediction about *future* budget balances over an indefinite horizon, it has no clear operational implication. Thus, the concrete approaches to assess debt sustainability have focused on sufficient (but by no means necessary) conditions for solvency; and since one can think of many such conditions, the debt sustainability literature has inevitably been quite eclectic.

After a brief discussion of the government budget constraint, we use the simple arithmetic of the debt-to-GDP ratio to derive a formal definition of solvency and a common operational condition satisfying the solvency constraint, that is, the stabilization of the debt-to-GDP ratio. The section concludes with a discussion of a widely used econometric test of debt sustainability proposed by Bohn (1998).

A. The government budget constraint

The idea behind any budget constraint is simply that nobody can have their cake and eat it, although this does not have to be the case every period. In modern economies, financial intermediation—mainly through markets and banks—allows some to spend more than their income, but only if others, in the domestic economy or elsewhere, spend less than theirs. The level of interest rates is expected to balance the demand and supply of funds.

For such a system to work, any debt contracted by an agent in deficit must be considered as an asset (wealth) by the agent in surplus. That is why debt

contracts must ultimately be honored. In short, solvency is essential to the stability of the system.²

The government is a special borrower on several counts. First, it is usually not expected to die or disappear so that there is no obvious end-period when all debts should be repaid. Second, default by the government is a particularly scary prospect because the size of the entity typically entails a considerable destruction of wealth, a collapse in national income, and guaranteed misery for those who cannot insure against such risks, usually the less affluent in society (Borensztein and Panizza 2009). Third, a government is sovereign. Concretely, this means that (i) it cannot be liquidated (there is no well-defined bankruptcy procedure giving lenders any claim on its assets), (ii) that it can often create fiat money to meet its obligations denominated in domestic currency, and (iii) that it can also raise revenues at discretion by hiking taxes—at least up to the point when tax rates become so toxic for the economy that revenues ultimately fall in response to higher rates (i.e., the Laffer curve effect).

Government's specialness implies that its budget constraint does not bind ex-ante and that servicing the debt is essentially a strategic choice, the outcome of a cost–benefit analysis. This brings political considerations, blurring the conceptually neat distinction between the willingness to service the debt and the ability to do so. For anyone trying to predict whether the government will meet its financial obligations over the foreseeable future, this constitutes a serious complication.

Of course, specialness has its limits. The budget constraint may not bind ex-ante, but it always binds ex-post. Thus, debt sustainability is not about whether the government budget constraint will be fulfilled (it always will) but whether the strategies used to stick to it are feasible and desirable. At the most fundamental level, the solvency requirement rules out default (complete or partial, negotiated or not) as a desirable option. Raising inflation to reduce the real value of nominal obligations (denominated in local currency) is also usually excluded from the set of acceptable strategies to stick to the budget constraint. The “inflation tax” is not only a shadow form of default, it is also hard to envisage in a world that has come to value independent central banks for their success in anchoring inflation expectations to harmless levels. The perceived costs of abandoning monetary credibility often seem exceedingly high and may explain the evidence that countries sometimes prefer an outright

² The expectation that governments will honor their debt in all states of the world is ultimately what makes their bonds safe. This characteristic has economy-wide benefits, if only for the stability of the financial sector, the viability of pension funds, and the conduct of monetary policy.

default (or to seek debt restructuring) on domestic debt to inflating it away (Reinhart and Rogoff 2009).

Handling these various considerations, and the interactions between them, requires extensive analysis and, in the end, a lot of judgment. While it is illusory to think that debt sustainability could ever be inferred mechanically from the government's balance sheet, comprehensive frameworks such as those developed by the IMF seek to organize a rich set of relevant data informing that judgment.

B. Government solvency and public debt stability

Since government solvency is the consensual *necessary* condition underlying debt sustainability, it is worth asking what makes a government able to honor its financial obligations in full. Some minimal arithmetic is required to fix ideas and understand why solvency cannot yield an operational definition of debt sustainability.

In any given period t , total government spending must be covered by revenues and bond issuance. To keep the notation as simple as possible, we make the conventional assumption that public debt consists of one-period bonds. The stock of inherited debt (D_{t-1}) must be repaid at the end of the period plus interest due (applying a rate r_t). The period- t government budget constraint thus writes as follows:

$$G_t + (1 + r_t)D_{t-1} = T_t + D_t, \quad (1)$$

where G_t is the non-interest (or primary) expenditure and T_t represents total tax revenues.³ At the end of period t , public debt D_t is the stock of past obligations D_{t-1} to which we add the interest bill $r_t D_{t-1}$, and subtract the difference between total revenues and primary expenditure, known as the *primary balance*: $PB_t \equiv T_t - G_t$.

$$D_t = (1 + r_t)D_{t-1} - PB_t. \quad (2)$$

Because the economy's taxable income roughly grows with nominal GDP, it is common to scale the nominal amounts in identity (2) in terms of ratios to nominal GDP (denoted by Y_t). The idea is that if government revenues can

³ Non-tax revenues (including interest-sensitive ones, and those related to monetary policy operations) are ignored here for convenience.

grow indefinitely, so can expenditure and debt. Assuming that Y_t grows at an annual rate θ_t , we can transform equation (2) as follows (with lower-case letters denoting ratios to nominal GDP):

$$\begin{aligned}\frac{D_t}{Y_t} &= (1+r_t) \frac{D_{t-1}}{Y_{t-1}} \frac{Y_{t-1}}{Y_t} - \frac{PB_t}{Y_t}, \\ d_t &= \left(\frac{1+r_t}{1+\theta_t} \right) d_{t-1} - pb_t\end{aligned}\tag{3}$$

At time t , the public debt-to-GDP ratio d_t results from the interest burden of past debt, the economy's rate of growth and the present primary balance.

The impact of the interest bill on debt-ratio dynamics depends on nominal growth. Under the conventional assumption that the interest rate exceeds growth ($r_t > \theta_t$),⁴ the debt-to-GDP ratio increases automatically because the rise in GDP (higher denominator) cannot counterbalance the additional debt (higher numerator) that would be required to pay the interest bill with borrowed funds. In that case, debt could snowball out of control unless part of the interest bill is funded with own revenues. The resulting primary surplus contributes to lower the debt ratio ($pb_t > 0$), although this might not be enough to ultimately stabilize or reduce the debt ratio. If instead newly borrowed funds in period t exceed the interest bill, a primary deficit ($pb_t < 0$) further adds to debt in that period.

To fully understand the hydraulics of the government budget constraint, we need to acknowledge the possibility to roll over public debt indefinitely. At the same time, it is intuitively clear that there could never be any "terminal" debt stock the government could conveniently dispose of at some hypothetical "end of times." Nobody in the economy would ever accept holding a bond that could not be realized to finance some future spending (e.g., O'Connell and Zeldes 1988). Technically, the impossibility to be in debt at the "end of times" is known as a "transversality" condition. Under normal conditions for growth and interest rates, this condition implies that for the government to be solvent, its debt d_t cannot exceed the present value of all *future* primary

⁴ In macroeconomic theory, this assumption is known as dynamic efficiency. It ensures that budget constraints are well defined by ruling out Ponzi schemes. However, that condition can be violated in practice, as discussed in Section 6.

balances. Equivalently, primary deficits must at some point be fully offset by surpluses. Thus, the government solvency condition writes as follows:⁵

$$d_t \leq \frac{pb_{t+1}}{\left(\frac{1+r_{t+1}}{1+\theta_{t+1}}\right)} + \frac{pb_{t+2}}{\left(\frac{1+r_{t+1}}{1+\theta_{t+1}}\right)\left(\frac{1+r_{t+2}}{1+\theta_{t+2}}\right)} + \dots \quad (4)$$

The concrete challenge of assessing solvency is immediately clear: given d_t , it amounts to predicting future fiscal policy (primary balances) over an infinite horizon. As if that was not hard enough, the simple deterministic arithmetic above ignores that such prediction is subject to considerable uncertainty surrounding (nominal) economic growth, borrowing costs, and the primary balance itself. The bottom line could be that government solvency is a genuine “known unknown,” and that assessing it is “mission impossible” (Wyplosz 2011).

However, regardless of the immense practical challenges, knowing whether (4) holds or not (without resorting to toxic strategies) is vital. One concrete approach derived from the above arithmetic is to look at the determinants of debt dynamics. This leads to intuitive indicators that are easy to interpret and widely used in debt sustainability frameworks.

From the public debt accumulation equation (3), the evolution of debt over time is given by:

$$\Delta d_t \equiv d_t - d_{t-1} = \left(\frac{r_t - \theta_t}{1 + \theta_t}\right) d_{t-1} - pb_t. \quad (5)$$

Changes in d_t are driven by the interest–growth differential, whose impact is directly proportional to the initial debt level, and the primary balance. As governments know that Ponzi strategies (i.e., paying interest with new debt) cannot be sustained forever, they are usually assumed to cater for solvency by generating higher primary balances in response to rising debt.⁶ Hence, debt dynamics are shaped by two opposing forces: the debt-increasing power of the “snowball” of the interest rate minus the growth rate (the interest–growth differential); and the debt-reducing effect of the primary balance.

⁵ Denoting $R_t \equiv (1 + r_t) / (1 + \theta_t)$, a more compact expression is: $d_t \leq \sum_{j=1}^{\infty} \Pi_{k=1}^j \frac{1}{R_{t+k}} pb_{t+k}$.

⁶ Section 3 discusses this assumption in greater detail.

If we parametrize the response of the primary balance to debt by setting $pb_t = \rho d_{t-1}$ (where $\rho > 0$), we can see from equation (5) that if such a response more-than-offsets the automatic debt buildup that would arise if interest payments were covered with borrowed funds, the debt ratio would revert to some historical mean pinned down by the long-run (or “steady-state”) values of the interest–growth differential and the primary balance.⁷ In other words, the condition $\rho > \frac{r-\theta}{1+\theta}$ ensures dynamically stable public debt trajectories.

Assessing whether the debt-to-GDP ratio belongs to a dynamically stable trajectory is at the core of debt sustainability frameworks, such as those developed at the IMF (see Annex 1). Although operational challenges remain daunting, the object of judgment (i.e., the stability of the debt path over the medium term) is more palatable than guessing the present value of future primary balances over an infinite horizon.⁸

The focus on short-to-medium-term debt dynamics also allows defining indicators that link debt sustainability to convenient measures of policy adjustments potentially required to preserve it. One such measure is the gap between the actual primary balance and the size required to stabilize public debt at a certain level over a given horizon. In its simplest incarnation, the indicator is the difference between the primary balance that would stabilize the debt ratio between t and $t+1$ and the projected primary balance for year $t+1$. The debt-stabilizing primary balance pb_{t+1}^o is easily found by solving equation (5) for $\Delta d_{t+1} = 0$, which yields $pb_{t+1}^o = \left(\frac{r_{t+1} - \theta_{t+1}}{1 + \theta_{t+1}} \right) d_t$. The debt-stabilizing primary balance is proportional to the inherited debt level with a proportionality factor given by the interest-growth differential. The resulting year-on-year gap is defined as $pb_{t+1}^o - pb_{t+1}$ (Blanchard 1990).⁹

⁷ Note that this stability condition applies regardless of the sign of $\frac{r-\theta}{1+\theta}$ (Bartolini and Cottarelli 1994) and is therefore robust to situations of persistently negative interest–growth differentials (as analyzed in Blanchard 2019). It nevertheless remains standard to assume that in steady state, the interest rate is greater than GDP growth (i.e. $\frac{r-\theta}{1+\theta} > 0$).

⁸ Note that one class of *theoretical* macroeconomic models—known as the Fiscal Theory of the Price Level—suggest that stable public debt dynamics around a well-defined steady-state is a precondition to ensure price stability when central banks use the interest rate as their policy instrument and public obligations are nominal (see Leeper 1991; Sims 1994; and Woodford 1994).

⁹ For instance, if public debt is at 60 percent of GDP and the differential between the interest rate and growth is 100 basis points, a primary surplus slightly below 0.6 percent of GDP keeps the debt ratio constant year on year.

While a large gap signals significant challenges to keep the debt ratio under control in the short term, closing the gap in one year may not be feasible nor desirable. Moreover, one year is an exceedingly short horizon to inform us whether debt is on a stable path or not. Therefore, similar metrics have been defined over a longer horizon. For instance, the European Commission's "S1" indicator calculates the constant yearly adjustment in the *structural* primary balance (i.e., adjusted for temporary influences on the budget, including the economic cycle and "one-off" expenditure or revenue items) needed to reach a given debt level at a predetermined date.¹⁰

While sustainability indicators capture the size of fiscal adjustment that is eventually required for debt to remain on a stable path, they say nothing about the realism of these hypothetical policies. Yet such realism is at the center of conventional definitions of debt sustainability which stipulate that solvency be maintained without enacting unrealistic or undesirable policies. One way to address this issue is to look at the tax-to-GDP ratio needed to stabilize debt at a certain level over a given horizon (given projected expenditure). The difference with the actual tax ratio may give a better sense of the policy *effort* required to stabilize debt (Blanchard 1990). The required fiscal adjustment can also be compared to historical norms. For instance, Abiad and Ostry (2005) suggest estimating "fiscal reaction functions" to get a sense of realistic primary balances one could expect in a specific context (as determined by history, external anchors, and institutions' quality). Similar work by Mauro et al. (2015) and Debrun and Kinda (2016) indicates that the debt-stabilizing response of fiscal policy varies with the level of interest rates, long-term growth, and inflation. The IMF DSA template reflects this approach by comparing the projected fiscal adjustment for the country under review to the distribution of observed fiscal adjustments in a large panel of countries.

Of course, realism must also apply to the macroeconomic assumptions underlying projected debt trajectories. Similarly to unrealistic policy effort, overoptimistic projections for growth, interest rates, or exchange rates can create the illusion of a sustainable debt position. The case of Greece discussed in Case Study 4.1 illustrates the criticality of realistic macro-fiscal projections to make credible debt sustainability assessments.

¹⁰ The algebra is obviously more involved than for the year-on-year gap but remains straightforward. Escolano (2010) provides complete derivations.

Case Study 4.1 Greece: A Case of Unrealistic Macro-Fiscal Assumptions

Recent experience with Greece underlines the importance of using realistic fiscal and macroeconomic projections. When the first signs of deep fiscal troubles emerged in 2009, it became clear that major fiscal adjustment was necessary to put public finances back on a sustainable path. At the time, Greece’s ability to turn dynamics in the primary balance around was, however, significantly overestimated and the primary balance undershot projections by an average of 3.2 percentage points per year during 2010–17 (Table 4.1).

The fact that fiscal projections were based upon general growth projections that were overly optimistic (Table 4.2), was a major contributor to the discrepancy in Table 4.1. Since both forms of over-optimism endured over time, originally envisaged projections for the debt-to-GDP ratio quickly became unrealistic. At the time of Greece’s first IMF program request (in May 2010, see IMF 2010), it was expected that Greek government debt would peak at 149 percent of GDP in 2013, subsequently declining to 120 percent of GDP by 2020. In reality, debt quickly shot up to about 180 percent of GDP before stabilizing. At the time of writing, the latest IMF projections suggest that Greek debt is highly unsustainable and, under the baseline scenario, the debt ratio is projected to exceed 300 percent of GDP by 2080 (IMF 2017a).

The fact that growth over-optimism was already present in Greece’s macroeconomic framework *prior to the crisis*, might have contributed to its origination. In October 2008, the IMF WEO predicted that average growth over the years 2009–12 would be 2.8 percent per year (a number in line with the consensus at the time). Because of this relatively benign assessment, neither creditors nor the Greek government seemed overly

Table 4.1 Primary fiscal balance in Greece, May 2010 forecast versus realization

	2010	2011	2012	2013	2014	2015	2016	2017
May 2010 forecast	−2.4	−0.9	1	3.1	5.9	6.0	6.0	6.0
Realization	−5.3	−3.0	−1.5	0.4	−0.0	0.7	3.8	3.7
Forecast—realization	2.9	2.1	2.5	2.7	5.9	5.3	2.2	2.3

Source: IMF (2010) and IMF WEO database.

Table 4.2 Real GDP growth in Greece, May 2010 forecast versus realization

	2010	2011	2012	2013	2014	2015	2016	2017
May 2010 forecast	−4.0	−2.6	1.1	2.1	2.1	2.7	2.7	2.7
Realization	−5.5	−9.1	−7.3	−3.2	0.7	−0.3	−0.2	1.4
<i>Forecast—realization</i>	1.5	6.5	8.4	5.3	1.4	3.0	2.9	1.3

Source: IMF (2010) and IMF WEO database.

concerned about Greek debt sustainability and credit continued to flow into the country. Growth over the period 2009–12, however, ended up disappointing by an average of 9.4 percentage points per year, implying that the borrowing which took place during the wave of relative optimism had led to a debt level that was now unsustainable.

Beaudry and Willems (2018) investigate the link between growth (over-) optimism and (over-)borrowing more systematically. They show that more optimistic growth projections typically induce countries to accumulate more debt—a response consistent with the idea of consumption smoothing. Such a response is not without risk though, as Beaudry and Willems also find that countries for which growth forecasts have been overly optimistic in the past, are more likely to develop debt crises in the future. If past borrowing decisions are based upon elevated growth expectations that fail to materialize, it is no surprise that servicing the accumulated debt might become problematic.

C. Econometric approaches to debt sustainability

Because the past can reveal useful information about the future, economists have proposed formal econometric tests of debt sustainability using time-series data. These tests can tell whether public debt and primary balance behavior have historically been consistent with solvency. Thus, any forward-looking assessment hinges on the assumption that the future will look sufficiently like the past.

Chalk and Hemming (2000) review early government solvency tests based only on historical data. They note that these tests capture sufficient conditions for solvency. That line of research revolves around the statistical property of *stationarity* of the two relevant time series in equation (4), namely public debt and the primary balance.

The unconditional distribution of a stationary time series does not change over time, implying that a stationary variable has no trend in its mean.¹¹ In a seminal study, Hamilton and Flavin (1986) argue that if the solvency condition holds, stationarity in the primary balance series implies that public debt is also stationary. Trehan and Walsh (1988) show that even if debt and the primary balance are non-stationary (or integrated), solvency is satisfied if both series move together (are “cointegrated”), with higher debt systematically associated with higher primary balances.

In a celebrated article, Bohn (1998) goes one step further, arguing that tests based purely on time-series properties of debt and the primary balance miss the general equilibrium conditions linking fiscal policy to the rest of the economy. Bohn’s “model-based-sustainability” suggests estimating the conditional relationship between public debt and the primary balance. This is done with a single-equation model explaining the primary balance by public debt and *temporary* variations in government expenditure (g_t) and output (y_t):

$$pb_t = \beta_0 + \beta_1 g_t + \beta_2 y_t + \rho d_{t-1} + \varepsilon_t \quad (6)$$

Bohn showed that a positive conditional response of the primary balance to public debt (i.e., $\rho > 0$) is sufficient to fulfill the solvency condition in a general equilibrium model under reasonable assumptions. This test has been widely used in the literature to assess whether fiscal policy was “responsible” in the sense of being broadly consistent with solvency. For instance, using a large panel comprising emerging-market and advanced economies over a 25-year period beginning in the early 1990s, Mendoza and Ostry (2008) show that government policy seems consistent with fiscal solvency in many countries (not just the United States, as investigated by Bohn).

Of course, a critical issue is the long-term perspective underlying that approach: the fiscal policy response to debt must be sufficiently systematic and stable over time to be meaningful. If that response is positive for a decade but subsequently fades away, no clear inference can be drawn in terms of whether fiscal behavior is consistent with debt sustainability. And indeed, the Bohn condition ($\rho > 0$) does not seem to be satisfied always and everywhere (Mauro et al. 2015). Mendoza and Ostry (2008) also document important differences between advanced and emerging-market economies, including a tendency of the latter to respond more strongly to debt developments than advanced economies, at least up to a certain debt level—around 50 percent

¹¹ A stationary series has neither a deterministic trend nor a “unit root” (that would imply the absence of convergence to some long-term value).

of GDP—beyond which the response weakens dramatically. The contrasted experiences of Germany and Japan discussed in Case Study 4.2 further illustrate how a stable and positive response of the primary balance to debt shape debt trajectories in otherwise fairly similar economies.

Case Study 4.2 A tale of two advanced economies: Germany and Japan

In many ways, Germany and Japan are similar. They are sizable economies that rely on a strong industrial base favoring export-led growth. Politically, they are stable parliamentary democracies that involve well-established political parties. And, yet, while broadly similar for a long time, the evolution of their public debt could not be more different (Figure 4.1). While debt ratios had been creeping upward in both countries until the late 1980s, the situation then changed radically in Japan. By now, the (gross) debt of the Japanese government is by far the highest among advanced economies. The puzzle is that despite studies consistently showing that there was no fiscal space in Japan, debt kept rising at a breathtaking pace until the mid-2010s

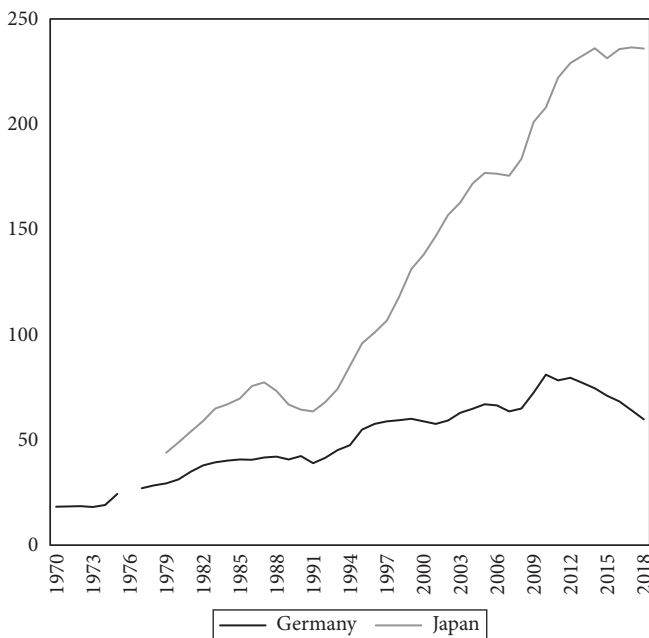


Figure 4.1 Germany and Japan: gross public debt (in % of GDP)

Sources: WEO.

Continued

Case Study 4.2 *Continued*

without causing the slightest concerns among lenders (the Japanese public itself, for the most part). In contrast, Germany successfully contained the debt buildup, reversing it after 2014.

The debt pickup in both countries around 1990 corresponds to a structural slowdown in growth rates, from an average of 2.5 percent over 1970–89 to an average of 1.7 percent in 1990–2018 in Germany, and from 4.8 percent to 1.2 percent in Japan. In addition, Germany's reunification also weighed on public finances during the early 1990s. In general, explanations for upward trends in public debt include:

- implicit or explicit strategy of eventually defaulting;
- confusion between trend and cycle: the authorities observe lower growth and adopt expansionary policies that fail to deliver the expected sustained boost;
- conflict with the central bank that responds by raising interest rates;
- lack of domestic support for fiscal discipline, which leads to destabilizing budgetary cycles when fiscal fatigue sets in.

The first explanation can be ruled out in both cases. This is obvious in the case of Germany but it also applies to Japan whose public debt is mostly held by local financial institutions, the central bank, and households. It would just be too costly to default. The second explanation is implausible over the long run but may have played a role for a while in both countries. The third explanation can be justified by central bank statements at various junctures, but there is no evidence that central banks systematically raised their policy rates in response to debt buildup and that higher policy rates are a significant deterrent for deficits.

The fourth explanation would imply a wrongly-signed coefficient on debt in the Bohn's fiscal reaction function (i.e., $\hat{\rho} < 0$). This is not the case in Germany, where the estimated coefficient is positive and highly significant (0.0357). For Japan, however, it is negative and highly significant (−0.300). This might reflect the non-linearity discussed later in the text but the scatterplot in Figure 4.2 suggests an alternative interpretation. While visual inspection confirms that the debt coefficient is negative for the overall period, it points to instability over time, with four distinct subperiods. The first one (1970–89), displays increasing efforts, eventually successful, at reducing the debt. The following period (1990–2000) is characterized by a

Case Study 4.2 *Continued*

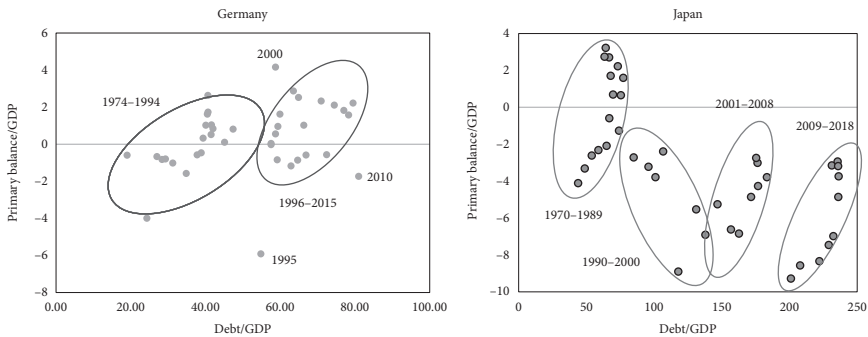


Figure 4.2 Germany and Japan: primary balance and debt (in % of GDP)

Sources: WEO.

clearly negative link between the primary budget balance and debt. Then come two periods of positive relationship (2001–08 and 2009–18), which debt-stabilization efforts of diminishing intensity from one period to the next. The opposite seems to characterize Germany. After 1996, the stabilizing response to higher debt appears to have become more vigorous.

From a practical angle, a major issue is that statistical tests of long-term conditions do not provide guidance on the debt paths and levels that we could safely consider as sustainable. For instance, knowing that the primary balance and the debt level should tend to move together is useful, but it does not rule out rising debt for a long time and to levels most observers, including market participants, would deem “unsustainable.” One reason for this is that the Bohn test does not imply any boundary on the primary balance, which makes too many debt paths and levels consistent with solvency. We address this issue in Section 3, showing how upper bounds on feasible primary balances defines “debt limits” beyond which the government cannot credibly commit to stabilize the debt.

3. Quantifying Credibility (“Debt Limits”)

As made clear above, solvency is secured if the government can *credibly* commit to generate sufficiently large primary surpluses at some point in the future. However, credibility is in the eye of the beholder so that solvency alone does not map into precise properties that any sustainable debt and fiscal policy path should exhibit.

This section first discusses how credibility might be questioned if governments find themselves unable to service their debt. The fundamental reason is that the primary balance cannot rise indefinitely. An upper limit on the primary balance implies that debt also has an upper bound beyond which fiscal policy could not avoid explosive debt dynamics. The section then turns to the strategic dimension of debt sustainability, suggesting that even if it were able to keep debt under control, a government might be unwilling to do so.

A. Fiscal fatigue and debt limits

A straightforward way to characterize a debt limit can be found in models that feature “fiscal fatigue” (Ostry et al. 2010; Ghosh et al. 2013b). Such models capture the notion that there exists a threshold for the primary balance beyond which the government can no longer keep up with higher interest payments—either because of economic forces (the Laffer curve) or political feasibility (incompressible spending). In such an environment, there will necessarily be a debt level above which debt dynamics become explosive. At that point, the government must either undertake extraordinary fiscal adjustment (where extraordinary means a break with its historical fiscal reaction function) or default on its debt. Default in this setup occurs because of an inability to pay, not for strategic reasons.

Of course, creditors will not be willing to lend to the sovereign at or near the point where default is imminent and will instead demand an increasing risk premium as debt approaches its limit. The general stochastic case, discussed and solved in the aforementioned papers, is rather complicated owing to the joint endogeneity of the risk premium and the default probability, but Figure 4.3 provides a heuristic treatment. The solid line is a stylized representation of the behavior of the primary balance as a function of debt. At very low levels of debt, there is little response of the primary balance to debt. As debt increases, the balance responds more vigorously, but eventually the adjustment effort peters out as it becomes increasingly difficult and costly to raise taxes or cut primary expenditures. The dotted line in the figure represents the effective interest rate schedule. At low debt levels, the interest rate is the risk-free rate and, assuming that output growth is independent of the level of public debt or the interest rate, this schedule is simply a straight line with slope given by growth-adjusted risk-free real interest rate.

The lower intersection A between the primary balance and interest rate schedule defines the long-run public debt ratio d^* to which the economy is

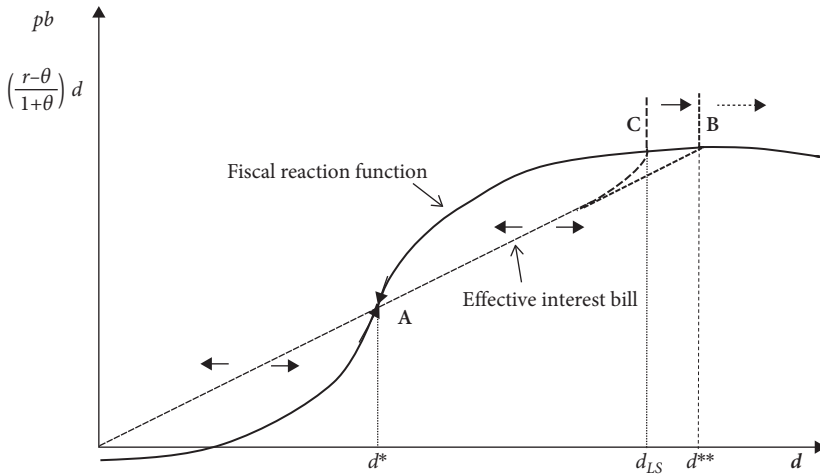


Figure 4.3 Determination of debt limit

expected to converge. This equilibrium is conditionally stable: if a shock raises debt above this point (but not beyond the upper intersection), the primary balance in subsequent periods will more than offset the higher interest payments, returning the debt ratio to its long-run average.

There is another (upper) intersection as well, however. Abstracting from stochastic shocks and the endogeneity of the interest rate, this intersection B yields a debt limit d^{**} above which debt is unsustainable: if debt were to exceed this point, it would rise forever because, in the absence of extraordinary adjustment, the primary surplus would never be enough to offset the growing debt service. At such a point, the interest rate becomes infinite as the government loses market access and is unable to rollover its debt. In the presence of stochastic shocks to the primary balance and an endogenous response of the interest rate to rising risk, the interest rate schedule of course is not simply the extrapolation of the risk-free rate, but rather bends upward as debt approaches its limit. In such a case, the debt limit d_{LS} is defined by the point C at which there is no finite interest rate that solves the “fixed-point” problem between the default probability and the interest rate (as debt rises, default risk rises which requires a higher yield to compensate investors; and the higher yield in turn raises the default probability).

In an attempt to operationalize these theoretical concepts, Ostry et al. (2010) and Ghosh et al. (2013b) estimate non-linear fiscal reaction functions on a cross-country data set covering twenty-three advanced economies over the period 1970–2007. These papers find evidence to support the notion that

fiscal reaction functions display fiscal fatigue, giving rise to debt limits: the relationship between the primary balance and public debt seems to be well-approximated by a cubic function. At low levels of debt there is no, or even a slightly negative, relationship. As debt increases, the primary balance also increases but the responsiveness eventually weakens and then actually decreases at very high levels of debt. This relationship is robust to the addition of a multiplicity of conditioning variables and a variety of estimation techniques. They then use their empirical results to compute *fiscal space*, defined as the difference between current debt ratios and estimated debt limits (Figure 4.4).¹²

That said, one should keep in mind that debt limits in no way represent normatively-desirable levels of public debt. The potential for surprises argues for normatively-desirable debt levels that are far below estimated debt limits (see Debrun et al. 2019). More generally, a key rationale for low public debt is

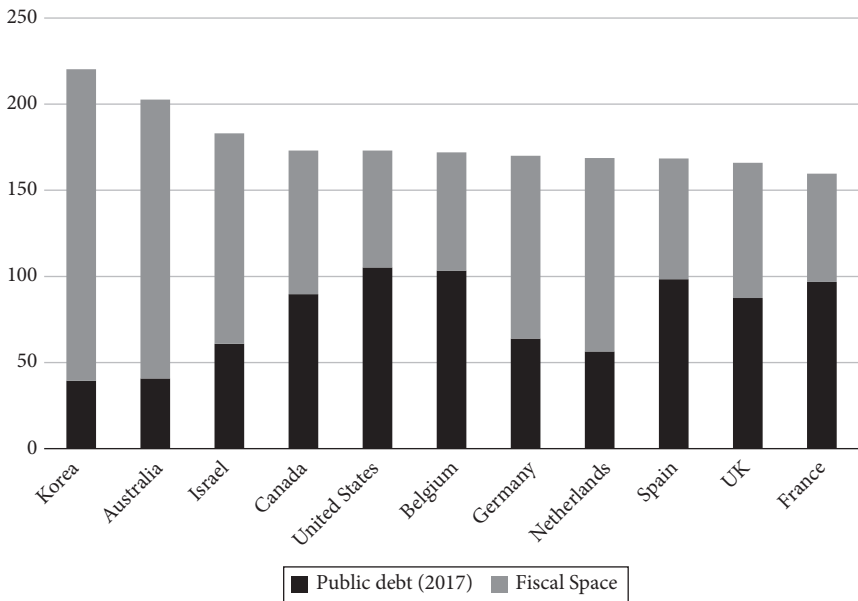


Figure 4.4 Selected advanced economies: debt limits and fiscal space (in % of GDP)

Note: The actual gross public debt at end-2017 and fiscal space sum up to the debt limit.

Sources: Ostry et al. (2010), Table 3; and October 2018 IMF Fiscal Monitor.

¹² Note that, as argued in Kim and Ostry (2018), the exact nature of the debt contract can affect fiscal space. For a given level of debt, countries will tend to have more fiscal space if their debt stock is of longer maturity. GDP-linked bonds could fulfill a similar role.

risk *management*: the desire for additional margins to cope with unanticipated or contingent risks. As emphasized by Barro (2006), for example, the option value of lower debt is particularly high if there are risks of catastrophic events such that the government would need to ramp up borrowing massively. If debt is high when such a shock occurs, a heavy penalty may be exacted as sovereign premiums rise and, in extreme cases, a shutout from markets would ensue.¹³ In other words, lower debt is needed today as insurance against the potential risk of a sovereign crisis tomorrow.

B. Why do countries with sustainable debts default?

Governments sometimes default because they cannot service the debt. At other times, they conclude that it pays to default. In a seminal contribution, Eaton and Gersovitz (1981) dissect the strategic choice to pay or not to pay the debt. In their view, defaults result from a cost–benefit analysis. Since defaulting amounts to a capital gain, there must be associated costs. Without them, default would always be the government’s preferred option, and it could never borrow. Hence, the very existence of public bonds is predicated on the presence of costs of defaulting. We now discuss what these costs may be.

Market exclusion

Eaton and Gersovitz (1981) assume that the penalty imposed in the event of a default is the inability to borrow. In principle, market exclusion must be permanent, otherwise new lenders would replace the defaulted-upon lenders. Also, the cost of permanent exclusion must exceed the gain from defaulting. As that gain is proportional to the total debt, lenders impose limits on total lending. In practice, the evidence is that exclusion is never permanent (Panizza et al. 2009), and rarely exceeds a few years (see, e.g., Sandleris et al. 2011; Richmond and Dias 2009; Sandleris 2016).

In order to explain temporary exclusions, Kovrijnykh and Szentes (2007) suggest that it may be profitable for creditors to resume lending after a default caused by a series of adverse shocks. Eventually, positive shocks will allow the lender to recover some of the defaulted debt *and* to make profits on new loans. To prevent the defaulting government playing lenders against each

¹³ Of course, as emphasized by Reinhart et al. (2015), countries have also availed themselves of a range of heterodox policies to deal with unpleasant shocks in an environment of initially high public debt. But the point about the benefit from relatively low debt, including for the future path of output following a financial crisis (see e.g. Romer and Romer 2018), remains.

other, all lenders should be bound by common rules, such as bondholders' committees and *pari passu* agreements enforceable in the lenders' jurisdictions.

Market discipline

Reputation loss is another cost of defaulting because it affects the risk premium demanded by creditors. The empirical evidence suggests that, following a default, borrowing costs rise once the country re-accesses markets. The increase may be steep initially, but it often dies out quickly (Borensztein and Panizza 2009). This result confirms the conclusion drawn by Bulow and Rogoff (1989) that reputation effects alone are unlikely to sustain lending.

Legal sanctions

Lenders may seek legal authorizations to impose a variety of sanctions.¹⁴ In theory, the defaulter's assets may be seized and trade forbidden, either directly by withholding trade credit or through the banking system to settle payments. In practice, however, courts' ability to constrain sovereigns remains limited. Following the adoption in 1976 by the USA of the Foreign Sovereign Immunities Act (FSIA), several countries have followed suit. While the FSIA allows private lenders to sue sovereign entities (governments and their agencies), restrictive conditions apply, which makes the legal firepower far more limited than in the case of disputes among private entities.

A standard court decision is to allow defaulted-upon lenders to seize assets such as pledged collateral, state-owned subsidiaries, exports of state-owned firms, payments for exports, government assets, and central bank reserves. While courts have become more open to order asset seizure, defaulting (or would-be defaulting) countries have managed to shield much of their assets.¹⁵

Collective negotiation

The more effective is a post-default negotiation process, the more lenders can impose costs. In the presence of many lenders, the process may be cumbersome, usually to their detriment. This explains the spread of collective action clauses, which are now standard in many jurisdictions. Recently, however, the emergence of distressed debt funds or vulture funds have complicated matters. These funds first buy securities at deep discount on the secondary market and then initiate litigation to obtain better terms than the investors who reached an agreement

¹⁴ For an extensive review, see Panizza et al. (2009).

¹⁵ A striking example is foreign exchange reserves that are deposited with the Bank for International Settlements, where they are protected by an international treaty.

with the sovereign through collective action. The holdouts buttress their position by asking to attach assets that are part of the agreement, which inevitably undermines the agreement.

The precedents have been in flux. While courts have recognized the rights of holdouts to litigate, they have often seen value in upholding agreements between sovereign and a strong majority of bondholders. The situation changed in 2014 when a New York Court backed a group of vulture funds that was blocking the agreement reached after more than a decade between Argentina and a majority of its creditors. One of these funds achieved a return of about 1,000 percent. Faced with this precedent, some countries contemplate legislation against holdouts.

Domestic costs

Defaulting may also entail large domestic costs. Some are related to sanctions, for example on trade or on loss of market access for the private sector, that weakens domestic financial institutions and therefore depresses domestic borrowing (Mendoza and Yue 2012). A default can also be a bad signal on the government (Sandleris 2016). It can affect investment decisions by firms, saving decisions by households, lending strategies of banks, or trade union militancy. The evidence shows that in all cases, a default can generate domestic disturbances and capital outflows that result in a deep recession and lead to economic and political turmoil.

4. Modelling Uncertainty

As any forward-looking exercise giving a key role to forecasts, debt sustainability assessments require awareness of the uncertainty surrounding medium-term debt projections. Clearly, two otherwise similar countries will be assessed differently if one exhibits highly volatile growth, interest rates, or budget numbers, and the other stable patterns in these variables. Unexpected developments can affect both policy implementation and economic and financial conditions, possibly pushing debt trajectories way off the “baseline.” Like the determinants of fiscal behavior, growth and interest rates, the sources of policy uncertainty and macroeconomic volatility are country-specific. DSA tools typically rely on two distinct methodologies to assess uncertainty: stress tests and probabilistic approaches displayed in the form of “fan charts.” This section reviews these two approaches.

A. Stress tests

In a purely deterministic world, the determinants of debt dynamics would suffice to inform debt sustainability assessments. In an uncertain world, however, that is not the case. Relative to the baseline, growth could disappoint, interest rates could skyrocket, the exchange rate could collapse, fiscal measures may not be implemented as planned (or have unexpected effects), and contingent liabilities could materialize. While good surprises could also happen, the real concern is that the trajectory of the debt-to-GDP ratio could be significantly more worrisome than envisaged in the baseline.

One approach to account for such uncertainties is to design adverse scenarios that capture particularly bad events for debt dynamics. These so-called “stress tests” aim at gauging the sensitivity of the relevant debt (service) indicators to unfavorable conditions. Typical scenarios include shocks to the primary balance, real GDP growth, the rate of interest, and/or the exchange rate (see e.g. IMF 2013). The bare-bone stress tests typically consider worse-than-expected realizations for one single determinant of debt dynamics taken in isolation, leaving projections for all other variables unchanged (which is a major drawback of this approach, since it neglects equilibrium effects). As Figure 4.5 suggests in the case of Italy, a broad range of adverse shocks could derail medium-term debt dynamics, pointing to significant vulnerabilities despite a relatively stable baseline projection. Corresponding simulations for the country’s gross financing needs also emphasize potential short-term stress in coping with higher deficits given the large stock of existing obligations coming due (see Section 5).

Simple stress tests are usually calibrated on country-specific circumstances as described by unconditional distributions of relevant variables. Calibration should typically strike a plausible balance between the intensity of the shock and its persistence. For instance, real growth could be assumed to be one-standard deviation below the baseline for two consecutive years or two-standard-deviations below the baseline for one year only, depending on the expected anatomy of a growth shock in the specific circumstances facing the country.

Beyond macroeconomic variables, stress tests are also used to analyze the impact of the materialization of contingent liabilities. These are potential liabilities, such as the need to cover losses in state-owned enterprises (SOEs), systemically important private companies, or public–private partnerships (PPPs).¹⁶

¹⁶ A public–private partnership is an arrangement in which a private party provides a public service (being paid for by the government). These arrangements have significant fiscal implications for governments—not only as the PPP contract might require the government to purchase the provider’s

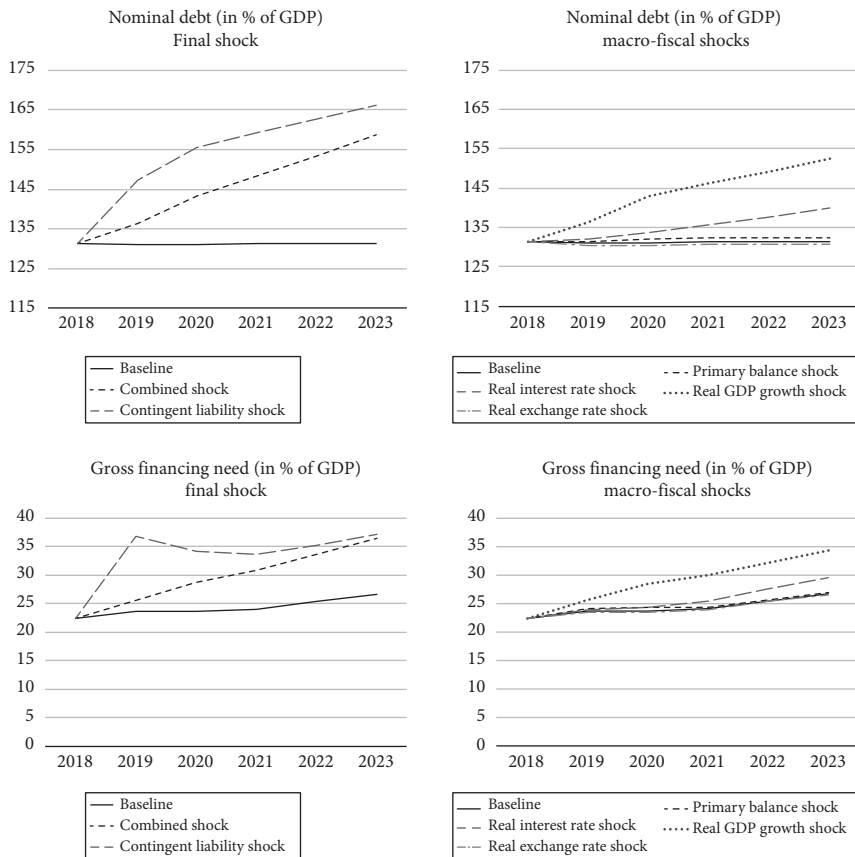


Figure 4.5 Italy: stress tests

Note: Primary balance shock: baseline minus half of the 10-year historical standard deviation. Real GDP growth shock: real GDP growth is reduced by 1 standard deviation for two consecutive years, starting in 2019. Interest rate shock: nominal interest rate increases by the difference between the maximum real interest rate over history (last 10 years) and the average real interest rate level over the projection period. Exchange rate shock: the maximum historical movement of exchange rate over ten years. Combined shock: incorporates the largest effect of individual shocks on all relevant variables. Contingent liability shock: one-time increase in non-interest expenditure that is standardized to about 10% of banking sector assets. This is assumed to be accompanied by lower growth for two consecutive years by $-1\frac{1}{2}\%$ points, and lower inflation by $\frac{1}{2}\%$. The primary balance is assumed to worsen by 11% of GDP in 2019.

Sources: IMF (2019).

Proper calibration requires extensive information about the government's on- and off-balance sheet operations, including exposure to potential SOEs' losses, the size of the financial sector (which is of systemic importance in

services for a certain amount of time, but also because the PPP might end up in distress (bringing significant transaction/renegotiation costs).

most countries), and the stock of PPPs. While countries following leading international practice in fiscal transparency publish detailed reports on contingent liabilities, this is not the case everywhere, and most stress tests end up being grossly calibrated (e.g., a one-off shock of x percent of GDP).

While well-designed stress tests should in principle inform analysts about sensible boundaries to potentially bad realizations of debt trajectories, they remain a deterministic exploration. In other words, any individual stress scenario, regardless of the care and sophistication underlying its design, has zero chance of ever materializing exactly. Shortcuts consisting of standardized stress tests do save time and resources, but they may come at the cost of being mostly irrelevant. Indeed, knowing the impact on the projected debt path of a one-standard-deviation reduction in GDP growth for one year (while nothing else happens in the economy compared to the baseline) is not particularly informative.

B. Fan charts

A more comprehensive approach to assess uncertainty is to prepare a very large number of different scenarios to obtain distributions of possible debt outcomes for each year of the forecast. Such information can be summarized in the form of a chart showing these distributions around the baseline (median) debt path. Those so-called “fan charts” not only give a more informative visual of the uncertainty around debt forecasts, but they also allow for an explicitly probabilistic analysis of debt sustainability (allowing for statements saying that public debt has a less than 10 percent probability of reaching its official target by the time of the next election, which sends a very clear message to voters and market participants).

Fan charts allow an illustration of how an economy’s intrinsic volatility—to the extent that is revealed by its own history of shocks—can affect the riskiness of its public debt level. For the sake of illustration, take two advanced economies (Italy and Portugal). For both, we can estimate a simple empirical model providing information on average relationships between the determinants of debt dynamics—namely GDP growth, the interest rate, and the primary budget balance—as well on the typical volatility of these variables given the estimated relationships among them. According to the empirical model, both countries

have similar steady state growth-adjusted interest rates, but Portugal faces a higher volatility of growth and interest rates than Italy.

The resulting fan charts are quite different and can be used to illustrate the intrinsic riskiness of each country's public debt (Figure 4.6). First, observe that the wider the fan, the greater the uncertainty surrounding public debt ratios, with each band capturing a probability mass of 10 percent, except the two extreme, lighter-shaded bands, that each represent an area where the debt ratio has a 5 percent chance of materializing. One obvious use of a fan chart is to calculate the probability of reaching a certain debt level at one point into the future. For instance, eyeballing the chart for Portugal shows that it has a roughly 30 percent chance (i.e., two shaded bands below the median) of seeing its debt ratio stabilize or fall below its initial level after six years.

Another useful application of such charts is to help countries develop a risk-management approach to fiscal policy. In Figure 4.6, each chart is built with a hypothetical starting debt level (in year 0) such that there is a 5 percent chance of reaching or exceeding the country's debt limit—represented by the horizontal line and taken from Ostry et al. (2010)—after six years. The lower volatility of public debt determinants in Italy explains why this starting public

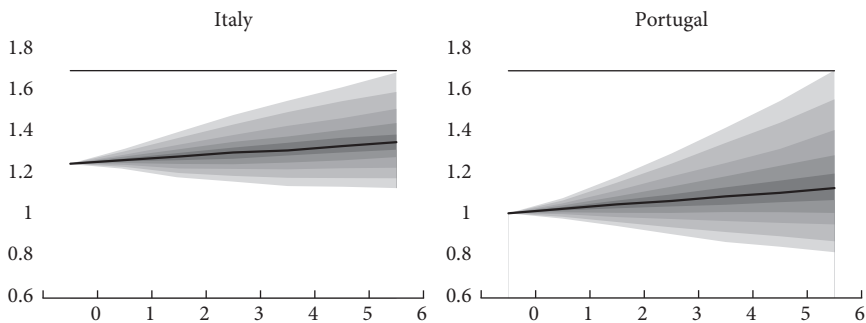


Figure 4.6 Italy and Portugal: fan charts debt-to-GDP ratios

Note: For each country, the initial debt ratio at year 0 is calculated to correspond to a 5% probability of exceeding the median debt limit for the sample of advanced economies considered by Ostry et al. (2010) at the end of a 6-year forecasting horizon. The limit is depicted by the horizontal line. Each colored band around the median projection represents a 10% probability mass for projected debt trajectories to belong to the corresponding interval. The two extreme light-colored bands capture a 5% probability mass. The fan charts show the distribution of 1,000 debt projections and were generated using a variant of the Celasun et al. (2006) routine.

Sources: Debrun et al. (2019).

debt level is around 120 percent of GDP, some 20 percentage points higher than the equivalent debt level for more volatile Portugal. In other words, the fan chart suggests that while a debt ratio of up to 120 percent of GDP is no cause for concern to a stable economy, it might be much more worrisome for a country more exposed to shocks.

That said, fan charts are only as informative as the inputs and methods used to generate them. There are indeed many ways to simulate thousands of randomly generated debt paths, and they can differ greatly in terms of information contents. Transparency about the “black box” behind random simulations is therefore essential.

In a nutshell, there are two polar approaches to building a probabilistic DSA. A simple but rather crude method is to randomly generate alternative debt paths that reproduce past forecast errors. This “reduced-form” approach thus shows analysts how uncertain their current assessment is if they can be assumed to remain as wrong in the future as they were in the past. At the other end of the spectrum, empirical relationships between all relevant variables for debt dynamics (mainly growth, interest rate, and exchange rates) can be estimated and used to generate a series of shocks over the forecasting horizon as well and forecasts for the determinants of debt consistent with those shocks (see Garcia and Rigobon 2004; and Celasun et al. 2006; Penalver and Thwaites 2006).¹⁷

Although it is more demanding in terms of data requirements and maintenance, the second approach is *a priori* much richer. First, econometric models such as Vector Autoregressions (VAR) are well suited to (i) capture the dynamic linkages between the determinants of debt as well as their underlying steady state values, (ii) to generate plausible sets of random disturbances, and (iii) to produce consistent forecasts for all relevant variables feeding into the debt accumulation equation. The second key advantage of a model-based approach is the possibility to incorporate an estimated fiscal reaction function, since governments tend not to stay idle in the face of rising public debt. An estimated reaction function also allows the incorporation of empirically plausible shocks emanating directly from the budget process and to account for more structural dimensions of a country’s capacity to generate primary surpluses, such as good institutions. Table 4.3 compares stress testing to the probabilistic DSA.

¹⁷ A host of intermediate options exist to generate random shocks and the corresponding debt paths, including ad-hoc shock distributions.

Table 4.3 DSA and risk assessment

	Deterministic stress-testing	Probabilistic approach (model-based)
Diagnostic based on...	... a few stylized, isolated shocks; exogenous policies	... many random shocks drawn from an estimated joint distribution; endogenous fiscal policy.
Calibration of shocks	Fraction or multiple of historical standard deviations of underlying variables	Based on the estimated joint distribution of disturbances
Output	Large temporary shocks provide a probabilistic upper bound to the debt ratio; small permanent shocks delineate interval of most probable outcomes	Frequency distributions of the debt ratio over time, “fan charts.” Gives a sense of the most likely range within which future values of the relevant debt (service) indicators are likely to lie
Main advantages	Amenable to standardized stress tests across countries; low data requirement	Better reflection of country specificity (in terms of shocks and fiscal policy behavior); explicitly probabilistic output

Source: Adapted from Celasun et al. (2006).

5. Incorporating Liquidity

So far, this chapter has focused on solvency, which is by essence a medium-to-long-run concept. As such, it largely ignores constraints that may bind in the short-term and that may jeopardize a debtor's ability to honor financial obligations. Liquidity problems, as they are known, have the same effects as the sudden realization of insolvency: default, restructuring, or other expedients.

As noted by Wyplosz (2011), the IMF (2002) definition of sustainability goes beyond pure solvency issues and covers circumstances typical of illiquidity. First, by considering “major corrections” in fiscal policy as inconsistent with debt sustainability, the definition implicitly captures what happens in a liquidity crisis, when in the absence of new financing at reasonable conditions, public spending should instantly match revenues to stick to the period budget constraint. Second, the explicit reference to the “costs of financing” acknowledges the role of market expectations and risk aversion, as reflected in sovereign risk premiums. By referring to sustainability as the ability to service debt, IMF (2011) effectively lumps together solvency and liquidity.

It remains the case that a perfectly solvent government can suffer from liquidity crises, and an insolvent one can go on for a long time before hitting the wall of illiquidity. This is the ugly face of the so-called multiple equilibria (Calvo 1988). As long as lenders' expectations converge on good outcomes

(solvency/sustainability), borrowing costs can remain low enough for public debt to stay on a sustainable trajectory. However, if for some reason, views about the riskiness of a country's public debt change, liquidity stress can suddenly arise, borrowing costs explode, and solvency can instantly become a problem. The self-fulfilling nature of sovereign debt crises complicates sustainability assessments.

Clearly, liquidity must be an important consideration in any comprehensive debt sustainability assessment. Here too, judgment is central, and it concerns lenders' willingness to cover the government's gross financing needs (that is the sum of the deficit and rollover needs) without sharp increases in risk premiums. To inform that judgement, indicators of the risks surrounding the debt trajectory will prove useful. In addition, detailed information about the debt structure in terms of maturity, bondholders' profile (domestic vs. foreign), the repayment schedule (smooth vs. lumpy), and the quality of debt management will help to obtain a more reliable forecast of gross financing needs and a better understanding of refinancing risks.

To assess liquidity risks in practice, the literature has relied upon so-called early warning models, as well as analyses of sovereign spreads. We now describe each approach in greater detail.

A. Early warning models

The early warning literature is rooted in studies that aim to find the determinants of fiscal stress episodes, typically defined as instances of a default, a restructuring, or an IMF-supported program of significant size. By aiming to explain general episodes of fiscal stress, such studies also capture crises that are predominantly caused by solvency-related considerations. But as most fiscal crises have an important liquidity component as well, contributions to this literature are thought to carry important lessons for liquidity-related aspects of debt sustainability.

An early contribution to the early warning literature was made by Manasse et al. (2003). Combining data from forty-seven emerging markets over the period 1970–2002 with logistic regression, they find that fiscal crises are more likely in the presence of high external debt, high short-term debt, high debt-service payments, a negative current account balance, tight US monetary policy, low real GDP growth, high inflation (volatility), as well as political uncertainty.

Empirical analyses that explore the determinants of fiscal stress can be used to estimate the probability of stress given a country's characteristics. As the

debt level is a determinant of that crisis probability, thresholds above which debt (or debt service) is deemed unsustainable can be inferred. This is the approach underlying the IMF's debt sustainability framework for low-income countries (see IMF 2017b). The idea is to set a cutoff probability π^* above which the risk of a fiscal crisis occurring (as implied by the regression equation) is deemed too high.¹⁸ One can then back-out the associated threshold values of the debt (service) indicators which would imply a π^* probability of a fiscal crisis, given average values for other crisis determinants in the equation. Table 4.4. shows the resulting debt thresholds in the IMF's current debt sustainability framework for low-income countries.

B. Sovereign spreads

As a liquidity crisis is characterized by a sovereign's inability to borrow at reasonable rates, liquidity risks can also be gauged from sovereign spreads. These spreads, often closely watched by financial market participants, can be obtained from bond prices or from Credit Default Swaps (or CDS, financial agreements whereby the seller guarantees to compensate the buyer in case of default on an underlying debt contract). Of these two, the latter offers the most precise signal of default because bond spreads may also embed other

Table 4.4 Thresholds in the IMF's debt sustainability framework for low-income countries

Debt carrying capacity	PV of PPG external debt		PPG external debt service		PV of total public debt
Weak	30% of GDP	140% of exports	10% of exports	14% of revenue	35% of GDP
Medium	40% of GDP	180% of exports	15% of exports	18% of revenue	55% of GDP
Strong	55% of GDP	240% of exports	21% of exports	23% of revenue	70% of GDP

Note: Debt carrying capacity is country-specific and determined by a country's score on a composite indicator, combining the quality of institutions, its growth rate, remittances, reserve levels, and world growth. PV = present value. PPG = public and publicly guaranteed.

Source: IMF (2018).

¹⁸ These probabilities can for example be chosen using data on past fiscal crises, with the objective of minimizing erroneous predictions, i.e. missed crises and false alarms.

information such as inflation expectations (Aizenman et al. 2013). However, for countries that borrow in foreign currency (e.g., US dollars or euros, as many emerging markets do), the inflation premium can be ignored. Consequently, many studies analyzing sovereign spreads in emerging markets have used the EMBIG spread index.¹⁹ Thus, both CDS and bond spreads embed a probability of default that can be backed out by making assumptions on “loss-given-default” and on the (time-varying) degree of risk aversion of creditors.

The most relevant empirical question in the context of this chapter is whether the conventional indicators of fiscal health have the expected influence on sovereign spreads. The literature analyzing the determinants of sovereign spreads goes back to Edwards (1984), who find a positive but statistically weak association with the debt- and debt-service-to-GDP ratios. By contrast, higher investment and international reserves (also scaled to GDP) tend to reduce spread, with the latter playing a particularly big role.

While the variables included in Edwards’ regression mostly capture a country’s *ability* to service its debt, a country’s *willingness* to do so is important as well (Bulow and Rogoff 1989). Proxying willingness by the level of external payment arrears, Boehmer and Megginson (1990) find that countries that signal a reluctance to service debt (by accumulating arrears) face higher spreads. Using bond-based primary yield data,²⁰ Min (1998) identifies a wider set of variables to play a role in determining the spread—including the terms-of-trade, the real exchange rate, the rate of inflation, and the level of net foreign assets. Like Edwards (1984), Min (1998) does not find a significant role for fiscal variables in explaining spreads. Other studies report mixed results.

However, once one accounts for the *composition* of fiscal policy, a clearer picture emerges: bond markets seem to distinguish between government spending and government investment—with Peppel-Srebny (2017) reporting that a higher deficit solely due to higher public investment lowers borrowing costs. This suggests that markets believe that the return on public investment improve the sustainability of a given debt level. Akitoby and Stratmann (2008)

¹⁹ JP Morgan’s emerging markets-focused EMBIG database includes Brady bonds, Eurobonds, traded loans denominated in US dollars, and local market debt instruments. Only issues with a remaining maturity of 2.5 years or more (and face value greater than USD 500 million) are included (see JP Morgan (1999) for details).

²⁰ As argued by Eichengreen and Mody (2000), looking at secondary spreads is preferable, and care should be taken in using primary yields. The reason is that results from primary issuances are likely to suffer from a selection bias: when financing conditions toughen, riskier borrowers might drop out of the market and not place any new bonds. As a result, it is possible that poor market conditions lead to a situation in which primary and secondary spreads move in opposite directions.

moreover find that revenue-based adjustment reduces spreads more than spending-based adjustment, while debt-financed spending widens spreads. This should serve as a warning that debt limits and budget balances thresholds should be taken with a grain of salt.

6. Emerging Issues

Despite the many conceptual and practical complexities related to public debt sustainability, it is still assessed using remarkably blunt tools that combine medium-term debt projections and basic indicators of the uncertainty surrounding those projections. In this section, we draw attention on three issues that might prove increasingly relevant in the foreseeable future.

A. Debt sustainability in members of currency unions

The recent episodes of acute sovereign debt stress in the euro area have been powerful reminders that governments operating in a currency union are special in at least two important aspects. First, monetization is not an obvious way out for them. Even if a new national currency could be created as an expedient, these countries would still have to confront the fact that their debt would be denominated in what would effectively become a foreign currency. Second, the members of a currency union might also be more likely to benefit from explicit or implicit bailouts or external guarantees. Indeed, because of the public good dimension of debt sustainability in any currency union, the will of the union's members to preserve the stability of their shared currency would void the credibility of no-bail-out commitments. In practice, many analysts in the business of gauging debt sustainability tend to treat members of a currency union differently (see Ghosh et al. (2013a) for a formal analysis).

On balance, participation in a currency union is often considered as negative for debt sustainability. For instance, a rating agency like Standard and Poor's assigns lower ratings, all else equal, to debt issued by currency union members, citing obstacles to a central bank backstop. Of course, countries might be reluctant to call on last-resort central bank lending in the face of sovereign stress. However, in stressed financial conditions, the very absence of such monetary backstop might increase a government's exposure to self-fulfilling debt crises—that is, a situation where higher debt causes higher lending costs which ultimately makes it impossible to stabilize the debt. Corsetti and Dedola

(2016) show this, arguing that central bank purchases of government debt (in exchange for currency and/or reserves) amount to swapping a claim subject to default for another one with a guaranteed face value (central bank money). Since money is subject to an inflation risk, an institution with strong anti-inflationary credentials is in a better position to provide such a backstop, which in the end can reduce the risk of self-fulfilling prophecies to the point that no actual debt purchase takes place in equilibrium.

Although the presence of such a monetary backstop seems easier to achieve in countries with their own currency, the ECB commitment to do “whatever it takes” to save the euro is not materially different from a lender-of-last resort function.²¹ The announcement of the so-called Outright Money Transaction (OMT) Program in August 2012 seems to have worked exactly as intended. The risk of self-fulfilling debt crises in the euro area has abated even though the program never had to be activated (Saka et al. 2015).

B. Low interest rates

As shown earlier, the link between the intertemporal budget constraint and conventional approaches to debt sustainability is based on the premise that the (risk-free) interest rate exceeds the economy’s growth rate. Absent this dynamic efficiency condition, the government budget constraint does not really bind. In terms of debt sustainability, it means that the debt-to-GDP ratio can be stabilized or even decline without forcing the government to run a primary surplus. In that sense, Ponzi behaviors can be consistent with debt sustainability.

In reality, episodes of negative interest-growth differentials are the norm more than the exception. For the United States Federal Government, Ball et al (1998) shows that the effective interest rate on public debt—measured as the ratio between the interest bill and the debt stock—was below nominal growth rates on average during 1871-to-1992, 1920-to-1992, and 1946-to-1992. Relatedly, Blanchard (2019) shows that the 1-year US Treasury bill rate has only consistently exceeded the nominal growth rate of the economy during the period extending from the late 1970s until 1990. Finally, for developing economies, Escolano et al. (2017) document large and negative differentials, reflecting mainly negative real interest rates in these countries.

²¹ ECB President Mario Draghi also observed in his 2014 Jackson Hole Luncheon Address that “public debt is in aggregate not higher in the euro area than in the US or Japan. [T]he central bank in those countries could act and has acted as a backstop for government funding. This is an important reason why markets spared their fiscal authorities the loss of confidence that constrained many euro area governments’ market access.”

Financial repression—a mix of regulatory measures creating a captive domestic market for government bonds—is often cited as the main culprit for this situation (Reinhart and Sbrancia 2015). This was certainly the case in industrial economies during the decades that followed World War II, and it still is by and large the case in many developing economies. However, this explanation is difficult to square with the persistence of negative interest-growth differentials in financially-open, advanced economies during much of the 2000s, and certainly since the 2008 financial crisis.

Regardless of whether very low interest rates are here to stay, the implications of this situation for debt sustainability analysis are important and require a discussion beyond the obvious aspects of debt arithmetic. Blanchard (2019) provides a comprehensive analysis of public debt in a low-interest environment. He concludes that even though low rates might appear to make public debt a free lunch, there remain welfare costs associated with high debt, albeit smaller than they would be with higher rates. Perhaps the strongest cautionary word against letting public debt grow to very high levels is the risk of self-fulfilling prophecies that invariably come with it. Aside the issue of multiple equilibria, there is a distinct risk that negative interest-growth differentials might quickly reverse as soon as governments are perceived as deliberately engaging in “Ponzi-gambles” (Ball et al, 1998). In the end, the most important item on the researchers’ agenda may well be to refine our understanding of public debt limits, including how financial markets and the rest of the economy react to a government approaching such limits. As long as a country has substantial fiscal space left, Ostry et al. (2015) argue that governments should not actively pay down the debt by running overall budgetary surpluses (because the insurance benefit of lower debt in such cases is likely to be smaller than the efficiency losses from temporarily raising taxes or cutting productive spending); instead they should allow growth or non-distortionary revenues (such as privatization receipts or royalties) to organically reduce debt ratios.

C. Beyond debt

Like all economic agents, the government has a balance sheet, an account that collects the *stock* of all assets and liabilities of the public sector. However, unlike most private agents, and certainly listed companies, it is often difficult to know what that balance sheet really looks like, either because it is not published or not even constructed. Ignoring the government balance sheet is

more than a mere issue of fiscal transparency. It forces us to ask whether the focus on gross public debt—only one component of the balance sheet—might not be too narrow.

Assembling a government balance sheet is a daunting task. The asset side includes items such as the present value of future tax revenues, financial assets, publicly owned natural resources waiting to be extracted, and non-financial assets such as public infrastructure, national parks, architectural wonders, and cultural treasures, all of which have no market value and whose price is consequently unknown. Aside gross public debt, liabilities include pension obligations and other civil service benefits, clearly big-ticket items in countries with unfunded pension systems. The difference between assets and liabilities—the “bottom line”—is the government net worth.

Like solvency, net worth is a theoretically clear-cut notion, and a conceptually attractive basis to define “sustainability.” And like solvency, net worth is fully intertemporal and defined over the very long-term. Arrow et al. (2004) suggested that a *non-decreasing net worth* is the right concept of sustainability.

However, like solvency, achieving a non-decreasing intertemporal net worth (INW) has no operational meaning and is arguably too far from anyone’s immediate concerns. This likely explains why most countries do not explicitly refer to net worth in the framework guiding the conduct of fiscal policy. For the sake of transparency, more and more countries publish a balance sheet and the related analysis. However, the very fact that nobody seems concerned with abysmally negative numbers for net worth is telling. Either they do not realize that they are contemplating sovereign insolvency, or nobody (especially bondholders) cares.

Aside conceptual considerations, the impracticalities related to INW are comparable to those associated with solvency.²² Data availability and valuation issues are pervasive and the intertemporal nature of INW makes it highly sensitive to assumptions about discount rates, just as the intertemporal budget constraint can be fulfilled with small variations in long-term growth or interest rate assumptions.

In practice, interest in the balance sheet approach suggests considering net public debt instead of gross debt to assess sustainability. For countries with significant liquid financial assets, DSA tools could arguably be run using a net

²² Solvency and the INW are intimately linked. For instance, the European Commission estimates the INW as the difference between the current net worth and the present value of all future primary balances *required to fulfill the intertemporal budget constraint* (the so-called S2 indicator). The Commission’s S2 sustainability indicator is simply the wedge in the intertemporal budget constraint (i.e. the difference between current gross debt and the present value of all future primary balances).

debt metric, an approach supported by the IMF when a country's own fiscal framework uses net debt as a reference (or anchor). That said, question marks remain about whether fire sales of state assets would be feasible to cope with severe liquidity stress, even if the capital losses that such sales could entail should be compared to the costs of outright default.

Regardless of the value of the INW for sustainability, a complete government balance sheet gives a better grasp on the risks facing the public sector. Shocks to the balance sheet are often absorbed by public debt, and the design of stress tests could only benefit from a reliable balance sheet and a careful assessment of the related risks (Clements et al. 2016).

7. Concluding Remarks

Assessing public debt sustainability is as critical as it is complicated. It is critical because unsustainable debts often end up in some costly combination of default, high inflation, and a broken financial system. It is complicated because sustainability is inextricably linked to solvency, that is the government's ability to honor all its current and future obligations. Thus, sustainability is a purely forward-looking concept, and assessing it amounts to making a prediction about the unknowable future.

As much as the consequences of insolvency are dramatic and visible, solvency cannot be precisely pinned down in real time with well-defined indicators, such as the debt-to-GDP ratio or the share of tax revenues allocated to debt service. And even though we can identify critical values of such indicators beyond which a government could be deemed *unable* to pay (e.g., a debt limit), we would still miss the fact that the decision to default (explicitly or implicitly) has a *strategic* dimension informed by a non-trivial cost-benefit analysis and shaped by political constraints. While conceptually neat, the difference between a government's *ability* to pay and its *willingness* to pay is difficult to capture in practice. Better understanding the determinants of (past) debt crises could nevertheless help identify critical debt thresholds that also reflect strategic considerations.

Faced with conceptual fuzziness and multi-layered complexities, practitioners have developed simple sustainability frameworks aimed at informing their judgment. These frameworks typically build on (i) medium-to-long-term projections for relevant debt ratios, (ii) indicators of the uncertainty surrounding these projections, and (iii) indicators of potential liquidity stress. Since the turn of the century, the DSA frameworks used at the IMF have

evolved to reflect both accumulating experience and the progress of applied research. In particular, the treatment of uncertainty has grown more sophisticated to include ex-ante assessments of the realism of the underlying macrofiscal forecasts as well as probabilistic tools (fan charts) complementing or replacing traditional stress tests.

One safe prediction looking forward is that preparing credible debt sustainability analyses will remain highly challenging. First, the persistence of interest rates below the nominal growth rate of the economy relaxes budget constraints to the point of making Ponzi games consistent with stable or declining debt ratios. This forces economists and practitioners to think hard about what a plausible debt limit could look like in such an environment, a key question being how market expectations could turn around and bring interest rates back above economic growth. Second, the aftermath of the 2008 financial crisis has emphasized the critical role that credible central banks can play in stabilizing sovereign bond markets and mitigating the risk of crisis despite high and rising debt levels. Beyond central banks, the behavior of bond investors warrants due consideration. The existence of a stable demand for assets considered as safe—e.g. because of the strong home bias of a large domestic investors' base or the reserve-currency status of the country—certainly matters when assessing debt sustainability. Third, as DSA frameworks evolve to incorporate more sophisticated techniques (like probabilistic methods), the resulting opacity should not make us lose the intrinsic value of simplicity when communicating about debt sustainability.

Annex 1. Debt sustainability analysis at the IMF

Public debt sustainability analyses play a key role in the work of the IMF: both in cases of surveillance (where the analysis is used to inform policy advice), as well as for IMF lending decisions (since the IMF is in principle banned from lending to a country if it believes public debt to be unsustainable).

To assess the sustainability of debt, the IMF employs two different frameworks: one for countries with market access (MACs, which focuses on total public debt) and one for low-income countries (LICs, where DSA focuses upon external public and publicly guaranteed debt). LICs tend to rely more on concessional financing, implying that the nominal value of debt is not necessarily a good indicator of their actual debt burden. Consequently, the IMF's debt sustainability framework for low-income countries places *the present value* of public debt at its core. The present value is inferior to its nominal value when the loan is provided at below-market interest rates or is accompanied by a grace period (during which the debtor is relieved from making repayments, without accumulating interest).

Central to the IMF's debt sustainability frameworks for both types of countries are debt dynamics equations (discussed in Section 2.B). Combined with forecasts for key macroeconomic variables, they yield projections for the debt ratio going forward. An assessment is subsequently obtained by analyzing this projected path and judging whether it passes the "sustainability bar." For both MACs and LICs, that assessment is guided by econometric analyses of past episodes of fiscal stress. Those approaches can either lead to "debt thresholds" (critical ratios, typically in terms of debt-to-GDP or debt service-to-GDP, beyond which debt sustainability is deemed in doubt) or indicators conveying the likelihood of future debt distress (for which one can set a tolerance level). Both tolerance and threshold levels are determined to minimize a weighted average of the rate of false alarms and missed crises over the sample period.

At the same time, both frameworks recognize that liquidity factors play an important role as well (see Section 5). Overall, the IMF's sustainability assessments are not solely informed by projections for debt ratios but by a broad range of indicators that take liquidity considerations into account. Particular attention is paid to indicators like the change in the share of short-term debt, liquid assets available to the government, spread levels, and gross financing needs (defined as the amount of financing required by the government, consisting of the overall deficit, amortization, and funds needed to address possible realizations of contingent liabilities). Gross financing needs and spreads often show significant co-movement, particularly around crises.

Finally, both IMF DSA frameworks also take uncertainty into account—particularly with respect to future paths for debt and debt service indicators. They do this through both fan charts and stress tests. While fan charts seem conceptually superior (see Section 4), they also require more data inputs, which does not always render them feasible.

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Debt Management

Thordur Jonasson, Michael G. Papaioannou, and Mike Williams

1. Introduction

Sound public debt management is a key element in ensuring debt sustainability. Debt structures that are robust to interest rate, exchange rate, or other shocks potentially allow countries to sustain higher debt levels at times of difficulty. Sound public debt management practices help them to finance their borrowing requirements and lessen risks embedded in their public debt portfolios, reducing the risks to government balance sheets and to wider financial stability (Jonasson and Papaioannou 2018). The identification of possible funding sources for financing needs, along with the identification, measurement, and management of public debt portfolio risks, are critical in determining appropriate debt strategies.

In assessing and deciding debt strategies, a debt manager traditionally analyzes a broad set of issuance strategies (e.g., foreign- vs. domestic-currency debt, fixed- vs. floating-rate debt, short- vs. long-term maturities). These strategies are designed to finance a pre-defined fiscal deficit, but are typically constrained by the country's debt risk indicators (IMF-WB 2014). In essence, each debt issuance strategy is assessed on the basis of its implied debt service costs and its impact on the relevant risk indicators. Stress tests determine the impact of changes in risk factors (e.g., exchange rates, interest rates) and the underlying macroeconomic conditions, on relative debt costs and risk indicators. Based on the robustness of these strategies to risk shocks, the debt manager ranks the different strategies.

For most middle-income and low-income countries, balancing cost and risk often remains an aspirational objective. Many developing countries have limited access to capital markets, domestic and external, and debt managers do not have the opportunity to choose from an array of options.

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Instead, they are usually faced with limited, and relatively risky, sources of financing. Consequently, a debt manager in a developing economy will often be preoccupied with seeking to develop debt markets, to establish new financing options. Objectives are broader and could include: (i) building a yield curve facilitating the private sector's pricing of risk; (ii) extending public debt maturities; (iii) creating benchmark issuances and building liquidity of secondary markets; (iv) diversifying the country's investor base, by attracting foreign investors or a new investor class, or developing new financial products for existing markets (e.g., inflation-linked bonds, zero coupon bonds); (v) supporting financial sector development, and in general promoting financial stability; and (vi) building sufficient foreign exchange reserves to weather a crisis (either from within or abroad).

The chapter is organized as follows: Section 2 presents the main debt management objectives from (i) a portfolio perspective and (ii) a wider policy perspective; Section 3 outlines the drivers of risk in debt structures, and the related issues of contingent liability management and debt sustainability; Section 4 presents some domestic and external debt issues, including the concept of "original sin" and an assessment of the investor base for advanced economies; Section 5 provides an overview of critical aspects of financial markets for debt management; Section 6 touches on some institutional and governance issues, including the interplay between cash and debt management, and the role of debt as a safe asset for the financial sector; Section 7 concludes with some comments on the lessons from recent experience.

2. Debt Management Objectives

A. From a portfolio perspective

The main objective of public debt management is 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. Prudent risk management to avoid risky debt structures and strategies (including monetary financing of the government's debt) is crucial. The macroeconomic consequences of a public debt default and the magnitude of the ensuing output losses can be especially severe (see Chapter 7). These costs include business and banking insolvencies as well as the diminished long-term credibility and capability of the government to mobilize domestic and foreign savings.

Minimizing cost, while ignoring risk, should not be an objective. Transactions that appear to lower debt servicing costs often embody significant risks for the government and can limit its capacity to repay lenders. Managing cost and risk therefore involves a trade-off. Judgments will have to be made based on the risk tolerance of the government, keeping in view other policy objectives and policy buffers. The conceptual approach underpinning the preparation of a debt management strategy is outlined in Case Study 5.1.

Case Study 5.1 Developing a medium-term debt management strategy

The medium-term debt management strategy (MTDS) operationalizes a country authorities' debt management objectives; it is a "plan that the government intends to implement over the medium term (typically 3–5 years) in order to achieve a desired composition of the government debt portfolio, which captures the government's preferences with regard to the cost–risk tradeoff" (IMF and World Bank 2009). In this context, "cost" is the cost of servicing the debt, usually expressed as a ratio of GDP; and "risk" is the volatility of debt servicing costs. The basic methodology explores how different issuance strategies perform against a range of macroeconomic scenarios.

Conceptually the task is to identify efficient issuance mixes. This can be expressed in the form of a cost–risk boundary (or indifference curve) where policymakers can choose their preferred trade-off between cost and risk. This choice is essentially a political one, because of the implications it has for inter-generational equality—see Figure 5.1. As Herbert Hoover said, "blessed are the young because they will inherit the national debt."

The same principles apply to assets as well as liabilities, and more developed countries try to integrate the management of assets and liabilities by matching the cash flows, at least of sub-portfolios (for example borrowing to finance a project and on-lending to the relevant executing agency on the same terms and conditions). In that way, they are better hedged against shocks. Insofar as this matching is possible across most assets and liabilities, the framework boils down to matching the present value (PV) of the fiscal position (i.e., the PV of future taxes less the PV of future expenditures) with the PV of debt, which is the equivalent of deferred taxes. On this approach, the ideal debt structure generates servicing costs positively

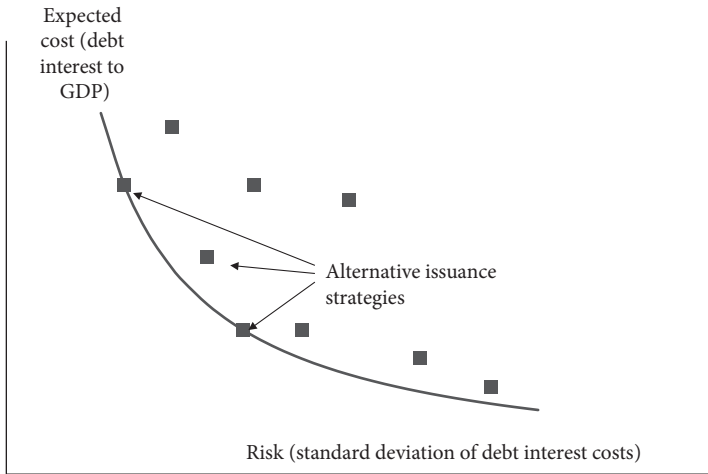


Figure 5.1 The cost–risk trade-off

linked to government revenues, sometimes referred to as “fiscal insurance.” If the impact of adverse economic shocks can be minimized in this way, it reduces the risk of having to increase taxes and the losses that that imposes on the economy. Similarly, countries that are susceptible to demand shocks may choose to issue index-linked debt (because revenues and servicing costs will tend to move together); but if there are greater risks from supply shocks that might be exactly the wrong strategy (see Chapter 9).

Cost-at-Risk (CaR) techniques can be used to rank different issuance strategies and liability management operations on the basis of their performance under different shocks. The ranking is determined within an optimization framework, where an objective function (the debt costs and risk indicators) and constraints (the available instruments and the prevailing macroeconomic framework) are explicitly specified by the debt manager. Stochastic simulations of scenarios allow each debt strategy or instrument mix to be assessed on the basis of how relative debt costs and risk indicators respond. The simulations assess the robustness of the different debt strategies by showing the probability of debt servicing costs exceeding a specified threshold (the CaR), and the strategies are ranked accordingly. It should be noted that the CaR approach does not take into account refinancing and credit risks, and that the implied debt issuance strategies and/or liability management operations may not always be feasible.

The CaR approach does allow an assessment of debt costs with a probability structure. Monte Carlo simulation methods are used to derive a

Continued

Case Study 5.1 *Continued*

cost–risk efficient frontier for portfolio structure or debt composition; on the efficient frontier, the cost of any debt composition is the lowest for any chosen risk level. The set of all such compositions reflects the cost–risk trade-offs that are faced by the debt manager. Given the government’s choice of an acceptable level of risk (or the maximum acceptable level of cost, which may in practice be determined by debt sustainability considerations), it is possible to choose a specific optimal debt portfolio on the frontier, that is, the benchmark portfolio. The target benchmark portfolio can then be used to design a country’s actual issuance schedule and liability management operations.

Developed economies, which typically have deep and liquid markets for government securities, often focus primarily on market risk, and, together with stress tests, may use sophisticated portfolio models for quantifying and measuring this risk. In contrast, emerging market and low-income economies, which may have only limited (if any) access to foreign capital markets and also relatively undeveloped domestic debt markets, should give higher priority to refinancing risk, that is, the risk of much higher interest rates or of difficulty accessing the market when it is time to refinance a bond. Where appropriate, policies to promote the development of the domestic debt market should be included as a prominent government objective. This objective is particularly relevant for countries where market constraints are such that short-term, floating rate, and foreign currency debt may, in the short run at least, be the only viable alternatives to monetary financing.

Poorly structured debt portfolios, in terms of maturity, currency, or interest rate composition and large contingent liabilities, have been important factors in inducing or propagating economic crises. For example, irrespective of the exchange rate regime, or the debt currency involved, crises have often arisen because of an excessive focus by governments on possible cost savings associated with short-term or floating rate debt (see Case Study 5.2 below for Mexico’s 1994 experience). Issuance of large volumes of such debt instruments has left government budgets seriously exposed to changing growth and financial market conditions, including changes in the country’s creditworthiness, when this debt has to be refinanced.

Excessive reliance on foreign currency debt poses particular risks, as it can lead to exchange rate and/or monetary pressures if investors become reluctant

to refinance the government's debt. This reluctance may be driven by external events; for example, many countries found external sources of finance drying up or becoming more expensive following the East Asian crisis of the 1990s. By reducing the risk that the government's own debt portfolio will become a source of instability for the private sector, prudent government debt management, along with sound policies for managing contingent liabilities (discussed further in Section 3.B), can make countries less susceptible to contagion and financial risk. Further, a debt portfolio that is robust to shocks leaves the government better placed to manage financial crises.

B. From a wider policy perspective

Sound debt management strategies can be instrumental in supporting financial stability, by creating a liability structure for public debt that sustains low refinancing risk for the sovereign throughout the business cycle. Debt management policies also interact with other government policies. Financial institutions typically hold a significant share of public debt in most countries. It is primarily the responsibility of the regulatory authorities to set and monitor financial institutions' prudential standards. But debt managers must recognize that their actions can have a very major impact on these institutions' balance sheets. Moreover, given the usually high level of interdependence of financial institutions, the effects can potentially have systemic implications.

This impact is relevant not only when discussing possible sovereign liability management and debt restructuring operations, but also when assessing the targeted debt composition. For example, although short-term debt involves higher refinancing risk, which could pose a higher risk to financial stability, longer-term debt may leave the holders' assets more exposed to the impact of interest rate fluctuations on their market value, that is, they represent higher value at risk (VaR) for the debt holder. Banking crises in Turkey and Uruguay in the 1990s and early 2000s were made far worse by the banks' exposure to longer-dated government bonds. Fixed rate bonds pose less risk to the government but may represent a higher risk to the investor. If individual investors, in search of higher profits, increase their exposure to interest rate risk and there is a hike in interest rates, the market as a whole may suffer as the unwinding of positions by some institutions triggers VaR thresholds for others.

Monetary policy raises similar issues. The long-established drive to separate fiscal and debt management policies on the one hand and monetary policy operations on the other, is underpinned by a recognition, at least in more advanced countries, of the weak links between debt management choices and

monetary conditions. This model, however, tends to assume highly liquid markets, and independence of policy instruments, which is not the case in less developed markets, where cash and debt operations may affect monetary policy operations and vice versa. Moreover, in developed markets this model is under strain from quantitative easing whereby central banks have set out to reduce or hold down longer-term interest rates, potentially affecting debt managers' decision making (Turner 2014). In all markets there needs to be some mechanism to facilitate high-level policy coherence. Arguably the government's portfolio strategy should take into account not only the structure of its own assets and liabilities, but also those of the central bank (both its government debt holdings and foreign currency reserves) (see Togo 2007).

Debt managers should be aware of and try to monitor their impact on these wider risks. They require a degree of coordination, or at least an opportunity for consultation, at the policy level, without jeopardizing the formal separation of operational decision making and the benefits in terms of clarity, focus, and accountability that flow from that.

3. Key Risks to Manage

A. Debt structures

In addition to ensuring that the government's financing needs and financial obligations over the medium- to long-term are met at the lowest cost consistent with a prudent level of risk, debt managers should target a sustainable debt service profile consistent with the government's medium-term debt repayment capacity and identify, measure, and manage debt portfolio risks (see OECD 2015).

There are clear trade-offs: on the one hand the superficial attraction of lower costs and a lower deficit in the short run, even if that means greater risk exposure; on the other hand, governments' responsibility to avoid exposing their portfolios to risks of large or catastrophic losses, even if they carry low probabilities. There are different drivers:

- *Maturity structure.* A government faces an inter-temporal trade-off between short-term and long-term costs that should be managed prudently. For example, excessive reliance on short-term or floating rate debt to take advantage of lower short-term interest rates may leave a government vulnerable to volatile and possibly increasing debt service costs, and even the risk of default if it cannot refinance its debts at any cost.

- *Foreign exchange exposure.* This can take many forms, but the predominant one is directly issuing excessive amounts of foreign-currency denominated debt and foreign-exchange indexed debt without hedging. This practice may leave a government vulnerable to volatile and possibly increasing debt service costs if its exchange rate depreciates, and again the risk of default.
- *Debt with embedded put options* This involves the ability of the holder to require redemption before maturity. If poorly managed, such options increase uncertainty to the issuer, effectively shortening the portfolio duration, and creating greater exposure to market/rollover risk.
- *Debt with early cancellation clauses.* Early termination events or rating trigger clauses can pose risks for debt management and need proper consideration.
- *Derivatives* (other than plain vanilla swaps aimed at reducing risk or hedging against movements in interest or exchange rates). Swaptions are sometimes used to alter current financial costs at the expense of higher future volatility.

The way that debt structures interact with market conditions can be particularly problematical. In addition to non-concessional domestic sources of financing, a number of emerging economies, in sub-Saharan Africa and elsewhere, are accessing international capital markets. Eurobond issuance has surged during a period of prolonged low global interest rates. However, the Eurobond market can be volatile and access conditions highly uncertain. Global interest rates are expected to increase and capital flow reversals could coincide with the initial wave of Eurobonds reaching maturity in the early 2020s. Refinancing risk could become acute, particularly for countries with macroeconomic imbalances.

B. Contingent liabilities

Risks do not arise only from the interaction between debt structures and economic shocks. Governments are also exposed to risks arising from both contingent liabilities—often in the form of a guarantee, that is, the promise to service the debt of a beneficiary if it fails to do so—and assets whose servicing is contingent, usually stemming from on-lending by government to a beneficiary. This credit risk exposure flows from the beneficiary's inability or unwillingness to service its debt, whether to a third party (in the case of a

guarantee) or government (in the case of on-lending). As discussed in Chapter 2, there are other contingent liabilities, both explicit and implicit; they include the potential costs to the central government flowing from public private partnerships (PPPs), the debt of state-owned enterprises (SOEs) or lower levels of government, (natural) disasters, and financial sector crises. A sound and prudent risk management framework includes well-defined risk management objectives, an analysis of risks, and the design and implementation of a risk management strategy incorporating monitoring, reporting, and reassessment procedures.

Requests for guarantees must be individually assessed and all contingent liabilities individually identified, analyzed, and monitored; but the aggregate exposure also needs to be assessed in the context of the government's balance sheet structure. Even though contingent liabilities are not recorded on the balance sheet, they can still pose a huge threat to government finances and should be included alongside other sovereign exposures, in order to systematically identify the interaction between the different risks and how they might be differentially affected by different shocks. Debt sustainability analysis (DSA) should normally include, as one of the potential shocks, how the crystallization of contingent liabilities might affect debt-to-GDP ratios or the path of debt service over time. But the debt management strategy analysis should take this a step further by considering how the balance sheet, as a whole, might be affected by different shocks and the scope for hedging the residual risks.

Sovereign debt managers use different risk management tools for contingent liabilities. Some operate at the level of the individual proposals, with an assessment of the risk and budget exposure, measured against the benefits. Credit risk fees should be charged for the guarantee, both as a way of mitigating the government's risk and ensuring that the project is properly assessed. The fees may flow to the budget or be retained in a fund (which may have earmarked assets or be retained in the general ledger) to meet the cost of guarantees being called. Initially, such fees may not be based on thorough credit risk analysis, but be applied at a flat rate. Over time, however, risk managers ideally refine risk mitigation and management tools and differentiate fees based on the projects' or beneficiaries' credit quality.

Similarly, there are different techniques for managing the aggregate risk from contingent liabilities. The crude but simple—and commonly applied—approach is to set a limit on the issue of guarantees, reflecting risk appetite. Several countries have adopted a fiscal target or indicator that is defined in terms of central government debt plus government-guaranteed debt. Although

the contingent liabilities are not recorded as debt unless and until they crystallize, the aggregate is reported alongside debt data. As sophistication grows, so do the tools. The limit might be set on expected exposure, rather than on the nominal value of the guarantee. Some countries have built econometric models that identify the expected losses in any one year and include provisions for losses in the budget accordingly.

C. Debt sustainability

Debt sustainability is analytically different from debt management. But the risk with any debt composition may depend on the level of debt; and countries with, say, a high debt-to-GDP ratio need to be especially careful about their debt composition and exposure to shocks. The Mexican tequila crisis of 1994–95, summarized in Case Study 5.2, is an example of how this interaction can have damaging effects.

Case Study 5.2 Debt management under sovereign stress: Mexico's Tequila crisis (1994–95)

The 1994 Mexican peso crisis, a currency crisis sparked by the Mexican government's sudden devaluation of the peso against the US dollar in December 1994, ignited a capital flight that became an international financial crisis, known also as the “Tequila crisis.”

During the 1994 presidential election, the incumbent administration embarked on an expansionary fiscal and monetary policy. Mexico's current account deficit grew to about 7 percent of GDP, and Mexico's treasury started issuing short-term peso-denominated treasury bills with a guaranteed repayment denominated in US dollars, called “tesobonos.” The tesobonos offered a lower yield than Mexico's traditional peso-denominated treasury bills, called “cetes,” but their dollar-denominated returns were more attractive to foreign investors. Mexico enjoyed investor confidence and new access to international capital following the entry into force of the North American Free Trade Agreement (NAFTA) in January 1994. However, domestic unrest and political instability increased investors' risk premium on Mexican financial assets.

Continued

Case Study 5.2 *Continued*

The higher risk-premia initially had no effect on the peso's value because Mexico had a fixed exchange rate. The central bank intervened in the foreign exchange markets to maintain the peso's peg to the US dollar by issuing short-term dollar-denominated public debt to buy pesos. With the peso growing stronger, domestic businesses and consumers purchased more imports, and Mexico began running a large trade deficit. Speculators' increasing recognition of the peso's overvaluation contributed to capital flight, further reinforcing downward pressure on the peso. Under election pressures, Mexico purchased its own treasury securities to maintain its money supply and avert rising interest rates, drawing down the bank's dollar reserves. Supporting the money supply by buying more dollar-denominated debt, while simultaneously honoring such debt, that is, servicing the tesobonos with US dollar repayments, depleted the bank's reserves.

On December 20, 1994, newly inaugurated President Ernesto Zedillo announced a devaluation of the peso, and foreign investors' fear of additional devaluations generated an even higher risk premium on domestic assets. This increase placed additional upward market pressure on Mexican interest rates as well as downward market pressure on the Mexican peso. To discourage the resulting capital flight, the central bank raised interest rates, but higher borrowing costs merely hurt economic growth prospects. When the time came for Mexico to roll over its maturing debt, the government was unable to sell new issues. Further, to repay tesobonos, the central bank had little choice but to purchase dollars with severely devalued pesos, which proved extremely expensive. Under these circumstances, the government faced an imminent sovereign default.

On December 22, the bank allowed the peso to float freely, after which it continued to depreciate significantly. The Mexican economy experienced hyperinflation of around 52 percent (by end 1995) and mutual funds began liquidating Mexican assets, as well as emerging market assets in general. The crisis led to financial contagion throughout developing countries, spreading quickly to economies in Asia and the rest of Latin America. The United States organized a US\$50 billion bailout for Mexico in January 1995, administered by the IMF with the support of the G7 and Bank for International Settlements. In the aftermath of the crisis, several of Mexico's banks collapsed amidst widespread mortgage defaults. The Mexican economy experienced a severe recession and deteriorating poverty and unemployment.

As discussed in Chapter 4, debt sustainability encompasses the concepts of solvency and liquidity. There is a range of indicators, although key ones include the debt-to-GDP ratio and debt servicing requirements over time, compared, for example, to expected government revenue. Debt management and debt sustainability have a different focus. The DSA focuses on medium-term vulnerabilities; it primarily feeds into fiscal policy decisions, notably on the primary balance. Debt management strategy analysis, on the other hand, focuses on the composition of the debt portfolio and its inherent risks, rather than its overall size.

The interaction goes both ways. The DSA recognizes that vulnerabilities can arise from the composition of the debt portfolio. But it is not designed as a tool to analyze how debt compositions can be altered to reduce those vulnerabilities and whether this is cost effective: that is the task of debt management. There are several ways in which the risk with any debt composition may depend on the level of debt. They include home country bias among investors, discussed further in Case Study 5.3. Others include the impact of shocks on domestic markets, the effectiveness of fiscal policy and the country's net asset position, as well as more obviously political and governance issues. In practice debt managers and DSA analysts should work together, drawing on the same underlying data and using similar scenarios.

4. Domestic and External Debt

A. The constraints on emerging market economies

Borrowing choices are constrained; and borrowing costs may depend on what is or has been practical. Emerging Market (EM) governments often face limited appetite for their securities in the local currency market, and may prefer to tap broader and more liquid markets in the major international currencies. In the 2010s, as in the EM bond issues of the 1980s and 1990s, many international bonds were issued in foreign currencies (mostly US dollars). The domestic currency markets were (and frequently still are) too thin and shallow, or virtually absent, in particular for long-term maturities. Issuers may also have had some opportunistic reasons and attempted to lower the cost of servicing their debt by exploiting lower foreign currency interest rates (Abbas et al. 2014).

Borrowing in foreign currencies can also be a result of “original sin.” These sovereigns might be willing but unable to borrow in local currency in the international markets as a result of investors’ lack of trust in the sovereign,

based on their past transgressions—their “original sin.” This problem (described in the seminal work by Eichengreen and Hausmann 1999), leads over time to external debt accumulation and currency mismatches on the balance sheet, exposing it to a real exchange rate depreciation. Another explanation for a country’s difficulty in borrowing in its own currency is the limited benefit to investors’ portfolio diversification objectives. The established practice in the international financial centers is to operate in a limited number of major currencies. As a result, developing countries, as latecomers to the international financial game, face an uphill battle when attempting to add their currencies to the international portfolio.

B. Advanced economies—investor base risk index

It is not news that EMs can be vulnerable to bouts of market volatility. Investors often trigger sudden stops—they stop buying or start selling off their holdings of government bonds. But it became apparent in the 2010s that advanced economy government bond markets can also experience investor outflows, and associated runs. At the same time, some safe haven countries have seen their borrowing costs drop to historic lows as they experience rising inflows from foreign investors, sometimes despite their domestic policies.

Several strands of research show that advanced economies’ sovereign borrowing costs also depend on who is holding the bonds—the demand side for government debt. Regardless of their level of debt, some countries are more at risk of sudden investor outflows, and associated spikes in government borrowing costs, as a result of the risk characteristics of their investor base. Tracking who owns what, when, and for how long, can shed some light on potential risks in advanced economies’ government debt markets. Standard measures of sovereign risk, such as debt-to-GDP ratios, are relevant; but it is important also to understand better the investor base for government debt, and why and how investors change their allocations.

In that context, Arslanalp and Tsuda (2014a, 2014b) have developed an “investor base risk index” that focuses on the stability of investor demand. The index runs from zero to 100, based on the composition of the investor base and the risk scores assigned to different investors, reflecting the way they tend to change their holdings. By this metric, countries with a high share of domestic investors, such as domestic banks and central banks, as well as foreign central banks, in their investor base receive lower scores. In contrast, high scores are assigned to countries whose investor base has a high share of

		Demand-side risk indicator	
		Low	High
Supply-side risk indicator	High	Quadrant I High debt but resilient to a run	Quadrant II High debt and prone to a run
	Low	Quadrant III Low debt and resilient to a run	Quadrant IV Low debt but prone to a run

Figure 5.2 A stylized framework for sovereign risk analysis

Note: Supply-side risk indicators could include gross debt-to-GDP ratio, net debt-to-GDP ratio, projected debt-to-GDP ratio or other measures of the supply of government debt. Demand-side risk indicators could include the investor base risk index constructed by the authors or any other measure that captures the refinancing risks inherent in the sovereign investor base.

foreign private investors, as empirically they are the most skittish in times of trouble.

The index is especially useful when used in combination with a supply-side risk indicator of government debt to assess the overall sovereign risk of a country. Figure 5.2 summarizes the thinking in a two-by-two table. The best of all worlds is represented by Quadrant III (low debt and low investor base risk), while the worst is represented by Quadrant II (high debt and high investor base risk).

Arslanalp and Tsuda (2014a) tested this idea by looking at how countries fared in terms of investor base risk at end-2009 before sovereign risk emerged as an issue for some advanced economies in 2010. The risk index suggests that several euro area countries were prone to a sudden stop as early as end 2009, before the later euro area debt problems fully came to light (Figure 5.3, Quadrant II). At the same time, countries with high debt and low investor base risk, which include Germany, Japan, and the United States, did not face similar market pressures despite their high projected levels of debt; while countries with low debt and low investor base risk, which included Australia, Canada, and Sweden, became the “new safe haven” countries during this period. Although hindsight is perfect, this classification is remarkably close to how markets ended up differentiating these countries in terms of sovereign risk after 2009.

This analysis also helps to explain the high debt, low yield puzzle. Both supply and demand dynamics drive trends on sovereign bond yields—and are likely to continue to do so in the future. Trends in the supply of government debt are relatively straightforward to follow and interpret, and

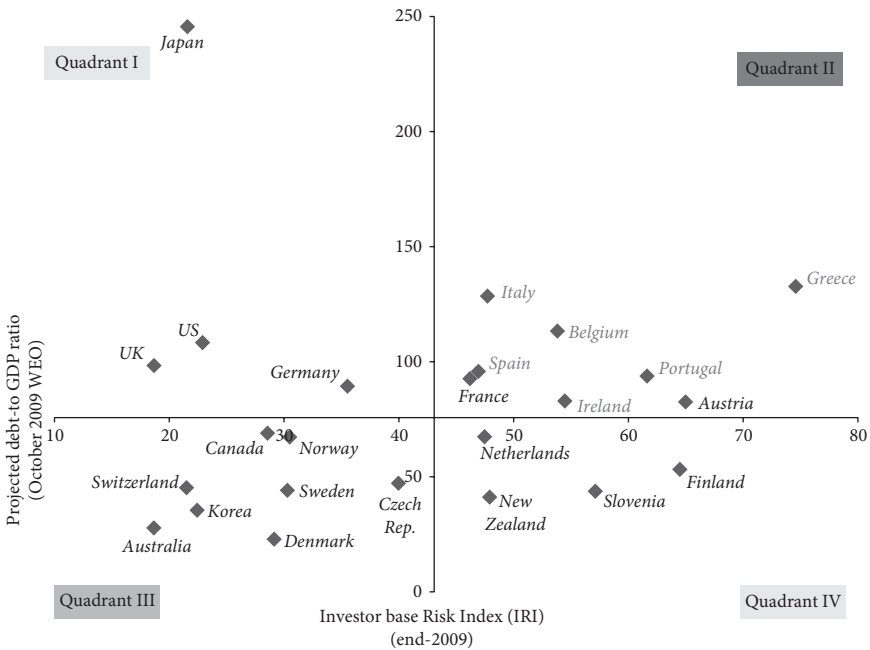


Figure 5.3 *Advanced Economies—Application of the Investor Base Risk Index, end-2009*

projected debt-to-GDP ratios are often available in, for example, the IMF's World Economic Outlook. But demand factors are more difficult to track and anticipate. Moreover, supply factors alone do not explain well recent changes in government bond yields. For instance, highly indebted governments like Japan still experience some of the lowest government bond yields among advanced economies.

The Investor Base Index can explain why some countries are able to sustain much higher levels of debt without pressure from financial markets. For example, despite continued worries about Japan's fiscal outlook, demand for government bonds, in particular from domestic investors, has been strong and bond yields have been stable—a fact captured by the risk index. This suggests that, where the investor base risk is low, high debt-to-GDP levels may matter less, as the likelihood of a run by sovereign investors is also lower. In that respect, the index suggests that Germany, the United Kingdom, and the United States may be in the same category as Japan, although for a different reason: those countries rank low in the index mainly because of the high share of foreign central banks in their investor base. Case Study 5.3 elaborates on the home country bias apparent in Japan.

Case Study 5.3 Home country bias in Japan

By the late 1920s Japanese companies had proved to be active issuers of corporate bonds. The government only reorganized its financial system into an indirect finance system—a bank-centric system—to concentrate its financial resources on war activities. After the war, the government kept the wartime financial system to finance the reconstruction of the national economy. The government pursued so-called “policy finance,” with commercial banks under generous protection and tight control. In the mid-1950s, a bank debenture market flourished. In 1966, the country issued bonds to finance capital investments for the first time after the war. The oil shock in 1973 triggered a severe recession in Japan, which from 1975 caused the government to issue bonds to finance current budget deficits. The Japanese government’s serious efforts to develop its debt market began at this time.

Bond market reforms started in the mid-70s, with corporate bond market reforms beginning in the 1980s and being substantially completed in the late 1990s. The impact of the 1973 oil shock led in 1974 to the first year of negative growth in the postwar period. To stimulate the economy, the government ran a large budgetary deficit, which was financed by the issuance of Japanese Government Bonds (JGBs). The government initially placed JGBs with commercial banks which had a large pool of private savings in deposit accounts. The demand side of JGBs was also favorable; the economic slowdown and growing balance of payments surplus generated increased private savings. The savings fostered institutional investors such as insurance companies, trust banks, and investment trusts. They in turn sought better investment opportunities in JGBs. At the end of 2018, bond yields in Japan were close to zero percent, despite a debt-to-GDP ratio of the order of 250 percent.

5. Developing Domestic Government Bond Markets

A. Emerging market experience

The development of local currency bond markets (LCBMs) has become a matter of growing policy interest in EMs. Faced with growing budgetary deficits, several factors have forced governments to finance their deficit by tapping funds from their domestic markets. They include the limitations of banking

sector financing, inadequate availability of foreign aid and concessional foreign loans from the official sector (i.e., foreign governments and multilateral institutions), and increasing awareness of the risks associated with borrowing in foreign currencies.

EM LCBMs have grown over time, with a significant issuance of domestic debt across a range of economies. Some recent trends are summarized in Case Study 5.4; cross-country comparisons are discussed more fully in Chapter 2.

Case Study 5.4 LCBMs: recent trends

At the end of 2017, EM total debt stood at an estimated US\$21.9 trillion of which general government accounted for an estimated US\$10.3 trillion. The share of local currency debt rose to an estimated 87.1 percent in 2017.

Geographically, LCBMs have remained largest in the Asia Pacific region. From 2016 to 2017, government local currency debt outstanding in the region grew by US\$1.1 trillion, mainly driven by increases in China and South Korea. However, there have been significant pockets of growth in LCBMs in several other EMs, including Brazil, Mexico, Slovakia, and South Africa.

The deepening of LCBMs is an essential tool for reducing foreign currency risk. That is not, however, a panacea since non-resident investors maintain large positions in several EM government bond markets, with substantial holdings of local currency bonds; and they feel exposed by a local currency depreciation. For example, in 2017 the share of non-resident investors in local currency government bond markets was above 30 percent in Indonesia, Mexico, Peru, Poland, and South Africa. China and India, two of the largest issuers of local currency bonds, have limited participation by non-residents, reflecting restrictions to access in those markets. Some countries have imposed capital controls to reduce the risk of sudden outflows but that itself brings risks if they damage investor perceptions of the underlying macroeconomic fundamentals. Participation of foreign investors in local currency non-government debt remains small, but is growing as domestic markets develop and an increasing number of instruments in EM currencies are issued in international capital markets.

The LCBMs of several emerging and low-income economies are now benefiting from attracting non-resident investors and extending maturities. In Africa, for example, Cote d'Ivoire, Namibia, Senegal, and Uganda more

than doubled the issuance of local currency government bonds between 2009 and 2014, with the stock of local currency bonds in these countries now on average equivalent to 8.5 percent of GDP. The maturity of bonds issued between 2009 and 2014 rose on average from 1.5 years to 6.4 years, with some countries such as Ghana, Kenya, Namibia, Nigeria, and Tanzania issuing local currency bonds in maturities over fifteen years.

The benefits of a vibrant domestic debt market go beyond providing a reliable source of financing for government deficits, and include many other positive externalities. The pursuit of developing countries in building deep and liquid markets also stems from the positive spin-offs they have on the development of the financial sector, its efficacy, and its flexibility in terms of monetary policy conduct and resilience to financial stability. Well-regulated, predictable, reliable, and liquid domestic debt markets can play a critical role in supporting economic growth, particularly in developing countries, at the macroeconomic and microeconomic levels.

The benefits of issuing longer-term Treasury bonds (T-bonds) are clear. By comparison with shorter-term securities, they minimize refinancing risk in the government debt portfolio and, by lengthening the average time to interest rate resetting, its exposure to interest rate risk. As the secondary market develops, it is the market prices of longer-term bonds that are the basis of the yield curve, against which corporate bonds can be priced and market risk hedged.

Establishing and developing domestic debt markets is a long and complex process that requires certain key preconditions. Many factors can inhibit the development of the market, including macro or political instability; financial controls; low domestic savings; paucity of institutional investors; proliferation of government agencies issuing securities, fragmenting the market; unpredictable issuance policy; and absence of the required market infrastructure. Potential obstacles to the development of a domestic market depend, therefore, on a country's overall degree and stage of development. Accordingly, to build a deep and liquid bond market, each country must develop its own reform plan suited to its conditions.

Debt managers are not responsible for ensuring that the macroeconomic preconditions are met. Instead, an inter-agency consultative process is required to establish the preconditions within the scope of a plan for overall macroeconomic reforms. Indeed, market development is probably best thought of as a project with many stakeholders and potentially with a

build-time of several years. There are set-up costs; and interdependences, prioritization, and sequencing all need to be addressed. The central bank and market regulators will need to be closely engaged and the private sector consulted or more directly involved. Policy making needs to be credible and consistent. Experience has shown that interventions are effective and reforms are best-enacted in countries where commitment begins with the top leadership and is conveyed to the ministerial level, particularly when key ministers are enlisted as partners to champion and implement reforms.

Essential preconditions

Initially, the government's main concern is to obtain the needed funding; after this, it can begin to focus on minimizing the funding cost and risks. Minimizing risks requires issuing longer maturities (reducing refinancing risk) at a fixed rate (reducing interest rate risk), and minimizing cost requires increasing the breadth and depth of the secondary market. Both objectives are linked. Investors are willing to buy longer maturities only if they are confident in their ability to sell the securities if they need cash. Investors are also willing to pay a higher price for a security with this advantage. In this case, the cost of funding the government is lowered, because the yield of a security declines when its price rises.

Credibility of the government as issuer of securities and rational policymaker

The political environment should be secure and the government should be credible before it issues securities. The legal framework should clarify the authority to borrow and issue new public debt, and to undertake transactions on the government's behalf. Investors and dealers need assurance that the debt office has legal authority to represent the government and that the government will stand behind the transactions into which it has entered. With this assurance, the market will focus on more advanced issues, such as whether the law adequately protects investors' rights; whether the regulatory environment ensures the safety of securities transactions; whether dependable legal procedures for dispute resolution provide for fair treatment; and whether the tax system is fair.

Uncertainty about future macroeconomic conditions—particularly about the course of inflation—will prevent the government from extending the yield curve beyond very short-term securities. If inflation is rapidly increasing and interest rates are high and volatile, investors will at best buy only very short-term securities with maturities no longer than a few weeks. High inflation

and high interest rates are indicators of economic and/or political problems, just like fever is an indicator of an underlying illness. Extension of the yield curve under persistent inflationary conditions may require issuance of inflation-indexed bonds or variable-rate bonds in the initial stage. A market can begin with a relatively high inflation rate; but to develop it needs government commitment to contain inflation.

Commitment of the government to pay market interest rates

The market cannot develop if the government enacts regulations to create a captive investor base by compelling some institutions to buy debt instruments (e.g., by obliging banks or pension funds to invest a certain percentage of their deposits in government debt), thereby enabling the government to issue at artificially low rates. Similarly, the market cannot develop if the government issues smaller amounts than announced or cancels a scheduled auction because of its subjective perception that asked yields are too high. The yields applicable to market instruments should be market-determined, not administratively set. The government should be committed to developing the market, financing itself through the market (not through captive investors), accepting market rates, and not manipulating auctions. The topic of “financial repression” is discussed at length in Chapter 6.

Guidance to the debt manager and transparency to stakeholders

The debt management strategy (MTDS) guides the government’s financing choices, set out in the annual borrowing plan (ABP); and for all but the poorest or most fragile countries, a key component of the ABP will be the issuance of domestic securities. The targets of the MTDS for the main portfolio risk indicators are an important guide to developing the issuance plan, that is, the mix, size, and timing of the securities to be issued to meet the gross borrowing requirement implied by the annual budget. Conversely, market constraints on the design of the issuance plan will inform the periodic review and update of the MTDS.

The debt manager as issuer of government securities must therefore juggle many variables:

- objectives for the liability portfolio as expressed in the MTDS;
- the need to meet the government’s financing requirement, taking account also of its profile across the year;
- the trade-offs between cost and risk implied by different instrument choices interacting with the trade-off expressed in the MTDS;

- the structure of demand, and investors' preferences as evidenced by the yield curve; and
- the importance of developing the domestic market.

Central to these decisions is building liquidity in government securities. The issuer benefits from greater investor demand and potential cost-savings. Investors benefit from reduced risk, and the ability to build a portfolio with the desired cost-risk characteristics. The wider market benefits from the great transparency of prices and yields, and the associated yield curve that is essential to pricing and the hedging of market risk.

Developing secondary market liquidity

Building liquidity has often proved a challenge. Many domestic government debt markets in EMs have grown impressively; but performance in the primary market has greatly outstripped that in the secondary market, which has often remained illiquid, with low turnover and little price transparency. Liquidity often suffers from a narrow range of investors and too many small (and therefore illiquid) bonds, which fragment the market. Even where the government is able to issue long-maturity bonds, they are often held by long-term saving institutions that are interested only in holding the bond to maturity to match known liabilities. The result is that EM governments pay a premium to investors for the risk of their holding relatively illiquid securities.

Not all these factors are outside the control of the debt manager. The need for coordination between the different agencies involved has already been stressed. But the debt manager has a direct role through the design of the issuance plan, and of the primary market. Central to this is the issuance of benchmark securities: large lines of T-bonds at key tenors. The large size improves the potential for wider distribution of the security among different types of investors with different incentives to trade, thereby increasing trading opportunities; it reduces search costs for those who want to buy; and it makes it less likely that any one transaction will change the market price. All these characteristics reduce the liquidity premium demanded by the market. EM government issuers are increasingly adopting a benchmark issuance policy to build sufficiently large lines of T-bonds as a necessary first step to foster secondary market activity. That in turn usually requires being able to issue successive tranches of the same bond; and it brings into relief the ability to deploy liability management operations. Such operations, whether buybacks or bond exchanges, can be used to build up a liquid bond of the chosen tenor;

and also manage cash management challenges as the larger bonds mature (see Section 6.C).

Predictability and transparency are the other essential characteristics of the issuance plan. It should be published—typically as part of the ABP with other documents supporting the annual budget. Investors will in turn be able to plan their own portfolios; and intermediaries their marketing strategies. Once it is published the issuer should try and keep to the plan—otherwise the benefits of publishing it are vitiated. Plans sometimes have to be changed, not least if the government's borrowing requirement changes in the course of the year. But it should be done in a way that is predictable—in the sense of consistency with previous policies. Indeed, “predictability” should be interpreted as predictability of policy responses: markets do not like surprises and the debt manager's decisions should be anchored back to well-defined and transparent objectives. Some countries also indicate at the start of the year the direction of any changes that might be necessary during the year.

Well-functioning money market

The money market is the cornerstone of a competitive and efficient system of market-based financial intermediation and plays several important roles. It facilitates monetary policy operations, with market-based instruments anchoring the short end of the yield curve and supporting the development of the foreign exchange market. It stimulates an active secondary bond market by reducing the liquidity risk attached to bonds and other term financial instruments, and by assisting financial intermediaries in managing liquidity risk. This latter aspect is especially important in supporting the development of primary dealers or market makers in government bonds: liquid short-term instruments are essential for financing their holdings of government bonds, which in turn underpins their functions of warehousing bonds—and reducing government's execution risk—in the primary market, and market-making in the secondary market.

Diversified investor base

A large and heterogeneous investor base with different risk preferences, investment maturity horizons, and trading motives ensures a strong and stable demand for government debt securities in a range of market conditions. It also gives more depth and liquidity to the market. This is not a precondition for a domestic debt market at inception; at the initial phase, only banking institutions participate. But, at a minimum, the country should have a sound

banking system that provides adequate appetite to invest in securities. Subsequently, contractual savings vehicles (institutional investors) such as pension funds, insurance companies, and mutual funds will provide a natural market for medium- and longer-term government debt.

Sound banking system

The soundness of the banking system is also relevant. Domestic and foreign investor concerns about the banking system will adversely affect the government's ability to roll over or issue new debt. It is essential that the banking system be subject to prudential regulations (including capital adequacy, lending standards, proper asset classification, income recognition, and reserving policies) that meet or approach international standards and provide for competent supervision and adequate enforcement capacity. At another level, lack of financially healthy intermediaries will damage secondary market liquidity. A banking system in crisis will further complicate government securities market development because important related markets, such as those for interbank and repurchase transactions, are unlikely to function properly.

Appropriate technical and regulatory infrastructure

In its initial phase, a securities market is merely a primary market: establishing the market basically requires only designing rules for auctioning securities and putting in place an elementary technical organization (e.g., a registry to give a legal title to instrument holdings, a central depository for the custody of instruments, and a clearing and settlement system linked to a cash payment system so that instruments can be transferred). At inception, few transactions will be done in the market, and they will all be handled by banks that are assumed to be sophisticated investors. Thus, there is no need for a sophisticated, high-capacity technical infrastructure (e.g., delivery versus payment system) or detailed regulations protecting non-bank participants. As transaction numbers increase and the number of market participants diversifies, a more efficient system for the registration, custody, clearance, settlement of, and payment for debt instruments must be established to support further market development. The systems used to settle and clear transactions must be cost-efficient and easy to use. They should offer delivery vs. payment, and final registration of ownership. They will need to have a clear legal basis, be subject to regulatory oversight, and have the capacity to process required trading volumes within the chosen settlement cycle.

6. The Institutional Framework for Debt Management

A. Organization and governance

The emphasis on predictability, transparency, and credibility brings into focus the institutional framework for debt management. It requires legal clarity, a strong governance framework and well-specified organizational structures. The management of operations requires sound business practices (including operational risk management) with staff subject to a code of conduct and conflict of interest guidelines.

The governance structure has a number of elements, but important among them are:

- A process that separates high level policymaking from execution. This promotes transparency and accountability, and ensures that debt management policy and strategic portfolio objectives are properly embedded in longer-term macroeconomic objectives.
- Flowing from this strategy, a (published) mandate should be given to the debt managers—that is, the ABP, discussed in Section 5.A. The mandate is usually agreed by the minister or cabinet, together with structured delegated authorities to operate within the mandate subject to specified parameters.
- The governance framework should also cover decision-making processes and responsibilities, performance reporting, and internal and external audit.

The need for an organizational structure that supports professionalism, accountability, and focus on objectives, with some protection from day to day political pressures, is behind the international trend towards setting up a debt management function with a degree of operational independence. A separate office helps to establish credibility with the market; encourages a more market-responsive approach; and, depending on the civil service pay system, may make it easier to recruit and retain skilled staff. But there are disadvantages: separation puts more strain on the governance framework, with exposure to principal-agent risk. The greater the institutional separation, the more definition is needed in target setting and performance monitoring; that in turn requires skilled staff in the ministry as well as the debt office. Location closer to the ministry supports flexible interaction with the budget and planning functions, or makes it easier for other officials to make use of the debt office's

specific expertise. These different considerations, in particular principal–agent problems and coordination requirements, mean that, in emerging markets, it is usually advisable to establish a specialized function in or institutionally close to the ministry.

In practice there is a spectrum of institutional arrangements. In many countries, particularly in EMs, the debt management function is just another part of the treasury or ministry. But it may have separate “bureau” status within the ministry, sometimes as part of a wider treasury (New Zealand, Finland, United States, Brazil, Philippines, South Africa, Turkey); or be established as a semi-independent agency within the ministry (Australia, the Netherlands, UK, Belgium, France), or sometimes the central bank (Denmark, Iceland). There are a few cases where it has been developed as a semi-autonomous agency within government but not formally part of the ministry of finance (Sweden, Portugal, Ireland, Nigeria) or even as a company owned by government (Germany, Austria, Hungary), often to allow greater pay flexibility. Many of these offices still use the central bank as fiscal agent; all use the bank for some services. Several, particularly in Europe, have important cash management functions, discussed below, and may also have responsibilities for, for example, management of assets or contingent liabilities.

B. The interplay between cash and debt management in safeguarding access to liquidity

The overriding objective of cash management is to ensure that the government is able to fund its expenditures in a timely manner and meet its obligations as they fall due. However, cost-effectiveness, risk reduction, and efficiency are also important, and specifically:

- minimizing the costs of holding cash balances in the banking system;
- reducing risk: operational, credit, and market risk;
- adding flexibility to the ways in which the timing of government cash inflows and outflows can be matched;
- supporting other financial policies, in particular debt management policy, monetary policy, and the development of domestic financial markets.

There are distinct phases in the development of a modern cash management function:

- Developing the Treasury Single Account (TSA)—the integration of government bank accounts, and the sweeping of overnight balances into a single account or a network of linked accounts held by the Treasury at the central bank.
- Building a cash flow forecasting capability—the development of capacity within the Treasury to monitor and forecast flows in and out of government—that is, changes in the balances in the TSA.
- Moving to more active cash management—borrowing and lending in the money market to a pattern deliberately designed to smooth or reduce the volatility of net daily cash flows.

T-bills are the usual instrument of choice in moving to more active cash management. Net T-bill issuance will be higher or lower in any week depending on whether outflows are expected to be higher or lower than inflows in that week. The forecast should also guide the maturities of the securities to be issued, as well as the volumes (and potentially also the volumes and maturities of any investments of temporary cash surpluses), with a view to smoothing the cash flow across the TSA. A smoother cash flow means lower average cash balances with reduced net borrowing costs and also less pressure on the central bank's monetary policy operations (because, other things equal, the mirror image of fluctuations in the TSA is fluctuations in banking sector liquidity).

T-bills are a core instrument in domestic financial markets. As a risk-free instrument they are important to banks, to meet risk and liquidity requirements; to asset managers, to facilitate achieving the chosen cost-risk trade-off; and to the authorities, to meet debt management, cash management, and monetary policy objectives.¹ They are also in demand as collateral. Government cash management is focused on a much shorter time period than debt management. Short-term T-bills are more useful than T-bonds or longer-term bills. It may be possible to issue T-bonds to refinance maturing T-bonds; but the underlying primary balance will have a profile linked, for example, to the quarterly or monthly timing of tax receipts, salaries, or transfers. Many countries use one-month T-bills for cash management, or T-bills with odd maturities linked to days of future inflow; the United States uses two-week T-bills. The volume issued can be more readily varied to offset peaks and troughs in the cash profile. T-bills with a maturity of three months or more

¹ T-bills can be used as monetary policy instrument by the central bank requesting the ministry to issue additional T-bills, the proceeds of which are then sterilized by being held in an account at the central bank. This technique potentially has some advantage over the central bank issuing its own bills, which may fragment liquidity in the nascent bill market with two very similar instruments competing.

are less flexible and the stock outstanding is more often held steady in line with investors' demand and portfolio requirements.

Repo² is the instrument of choice for fine tuning or for borrowing and lending outside the normal T-bill issuance schedule. Repo has the great advantage that the lending is collateralized, reducing any credit risk concerns. It is also very flexible, in both the speed of execution and the range of maturities available. Many settlement systems are able to settle transactions on the same day, also handling the collateral automatically. For the same reasons, repo has a central role in the development of the financial market.

Central banks rely heavily on repo for liquidity and short-term interest rate management. It can stimulate the interbank market by removing credit risk concerns. Primary dealers can repo out securities to finance purchases of the same securities. Repo can support short-selling, another characteristic of efficient market making, with the security sold repoed in ahead of settlement. More active cash management will itself be a stimulant, including of the T-bond market, since domestic T-bonds are normally the preferred collateral. These linkages are illustrated in Figure 5.4. This benefits the debt

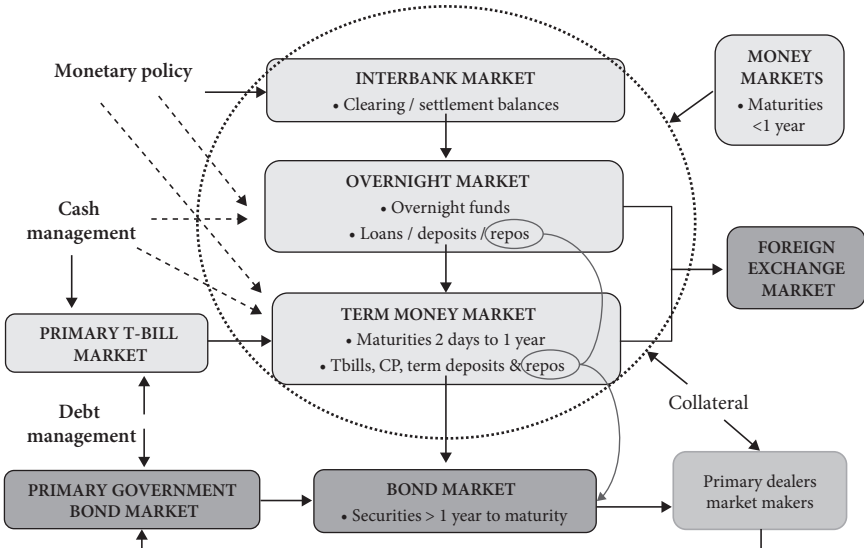


Figure 5.4 Money Market: Interaction with other Financial Markets

Source: Modified from: Mike Williams (2010).

² A "repo" (short for sale and repurchase agreement) is the sale of securities tied to an agreement to buy them back later. A reverse-repo is the purchase of securities tied to an agreement to sell back later. A repo is best thought of as a collateralized loan. T-bills or T-bonds (or central bank paper) are the dominant collateral for repo transactions, particularly in the early development of the market.

manager who, as well as issuing T-bonds, may also need to lend or repo bonds temporarily to the market makers to ensure that they are always able to provide a two-way market.

C. Importance of cash and debt management coordination

Debt and cash managers must work closely together; indeed, in many countries the functions are now integrated, whether in a fully-fledged debt management office, of the kind in many eurozone countries, the United Kingdom, Sweden, Hungary, and Australia; or through merger or integration between treasury and debt management directorates, as in Peru, Colombia, Turkey, and South Africa.

Debt managers have to juggle the full range of instruments in making decisions about issuance. They have to trade off from day to day, week to week, and month to month, the demands of the strategy and the demands of the market, with issuance choices, of both T-bills and T-bonds, taking into account demand, supply, and price information. In relation to demand, intermediaries and/or end-investors may need a steady flow of T-Bonds to meet their obligations, or shorter-term instruments for liquidity management. Their needs will change across the year with their own cash flows and market developments. From the supply perspective, government financing choices have to be made in the context of the profile of financing flows, whether it reflects the profile of the primary deficit or of debt servicing payments.

There are other day-to-day coordination requirements between debt and cash managers including:

- Linkage of issuance dates with redemption dates, to maximize the opportunities for investors to roll over into a new issue.
- Maturity dates should also be chosen to avoid weeks, and especially days, of heavy cash outflow (e.g., salary payments); and indeed, should target days of cash inflow (the due date for tax payments).
- Debt managers can, through liability management operations, mitigate the cash management problems that potentially arise when large bonds come to maturity.

The costs of a failure to coordinate debt and cash management decisions is not immediately apparent. Some of it arises from the income forgone from investing surplus cash; and since debt servicing payments are usually given priority in the parliamentary approval processes, the costs of extra borrowing

are not subject to the same scrutiny as other expenditures. But there is a cost. This is apparent in those EMs who in recent years have very properly built their debt management capacity, but left the longer-established treasury function relatively untouched. Since debt managers tend to focus on the redemption profile, it is left to the treasury to cope with in-year fluctuations; but the only tool that they have is building an expensive cash buffer—the interest earned on surplus cash is much less than the cost of additional borrowing. For prudential reasons, some countries also frontload debt issuance to build a cash buffer, which can similarly be costly. At least some countries are now alive to the benefits of investing temporary surpluses back into the banking system; both to earn more interest and to help smooth cash flows: China and Russia are examples among larger countries.

There is widespread awareness of the importance of developing the TSA, and even the poorest countries have taken some steps to do so, and are starting to build a forecasting capability. The move to more active cash management may take longer, and has to be linked to the development of the money market. But the potential strain between debt and cash management objectives over whether to issue T-bonds or T-bills when faced with an imminent cash shortage is lessened as the scope for active cash management develops. The issuance of bonds with a stable and predictable pattern reduces market uncertainty and intermediaries and investors can better plan ahead. With a liquid money market, the timing of bond sales can be separated from the profile of the government's net cash flow. It is left to T-bills and other money market instruments to deal with the short-term fluctuations. That in turn greatly improves the transparency and efficiency of debt management.

As interaction with the market develops, the integration of debt and cash management functions becomes especially important. It ensures that the government presents a consistent face to the market. Where two parts of government are interacting with the market, there are risks of giving conflicting signals, adding to uncertainty, and also potentially distorting the money market. Front office staff directly managing the transactions in the market may also need to intervene in the money market for debt management reasons, or in the debt market for cash management reasons.

D. Role of debt as a safe asset

Debt plays an important role as a safe asset and has policy relevance on several levels: it (i) provides a benchmark yield curve for the corporate debt

market; (ii) supports liquidity management operations of the central bank; (iii) provides an investment alternative with little or no risk of default for investors; (iv) maintains and develops smoothly functioning financial markets; and (v) provides market infrastructure through a robust payment and settlement system and a strong legal framework (i.e., collateral and bankruptcy laws).

Safe assets are used as a reliable store of value and aid capital preservation in portfolio construction. They are a key source of liquid, stable collateral in private and central bank repo agreements and in derivatives markets, acting as the “lubricant” in financial transactions. As key components of prudential regulations, safe assets provide banks with a mechanism for enhancing their capital and liquidity buffers. As benchmarks, safe assets support the pricing of other riskier assets. Finally, safe assets have been a critical component of monetary policy operations.

These widely varying roles of safe assets and the differential price effects across markets make it difficult to gauge the overall price of safety. A tightening of the market for safe assets can have considerable implications for global financial stability, including an uneven or disruptive pricing process for safety. As investors scramble to attain scarce safe assets, they may be compelled to move down the safety scale, prompting the average investor to settle for assets that embed higher risks.

Implementation of the Basel III capital and liquidity framework also has important implications. The weighing of assets and risk weighing of government securities will have an impact on the level of capital adequacy. The Basel III liquidity framework, which defines high quality liquid assets, may not fully reflect financial market structures in EMs, impacting the functioning of domestic financial markets and raising the need for national discretion to, for example, adjust for lack of market liquidity in the relevant assets.

In response to the global financial crisis, authorities in many jurisdictions are encouraging greater use of central counterparties (CCPs) for over-the-counter (OTC) derivatives transactions. In particular, the G20 has agreed that all standardized OTC derivatives should be centrally cleared so as to lower counterparty credit risk through multilateral netting. The global nature of OTC derivatives markets has also highlighted the need for international coordination to establish minimum cross-border risk management standards and avert regulatory arbitrage in cases where CCPs compete with each other. The expected changes in OTC market infrastructure will likely increase demand for safe assets via higher demand for collateral.

A shift toward central clearing of standardized OTC contracts will eliminate some of the need for bilateral collateralization; but the move of a critical

mass of OTC derivatives to CCPs is expected to increase the demand for collateral. The higher demand would arise from an initial margin that typically is not posted on bilateral interdealer trades, and from contributions to guarantee funds at the CCP. Moreover, a proliferation of CCPs without mutual recognition may raise total collateral requirements even further. The lower estimate is associated with exemptions of certain types of OTC derivative counterparties (such as sovereigns and “hedgers”) or types of contracts (such as foreign exchange derivatives) from the central clearing mandate. More importantly, restrictions on the market reuse (rehypothecation) of collateral posted with CCPs may lower the effective supply of collateral in the market and hence increase the liquidity risk premium (Singh 2011).

7. Concluding Remarks

We conclude by presenting some experiences and considerations with regard to issues faced by debt managers. In their consideration of the risks and trade-offs when developing financing strategies and issuance plans, a distinction may need to be made between developed and developing economies. Middle- and low-income economies may lack market access and, as a result, are often forced to accept additional risks and costs. As noted above, for short-term domestic debt, governments face an intertemporal trade-off, that is, excessive reliance on short-term or floating rate debt to take advantage of lower short-term rates. However, access to long-term financing is sometimes simply not available (at any cost). Low-income countries need to build their yield curve and lengthen maturities; but short-term external debt might be the only option for those that do not have sufficiently robust domestic markets or domestic financing sources. Issuing short-term debt can pose a significant refinancing risk, especially for infrequent issuers or those with macroeconomic imbalances, where market conditions can change radically, bringing exposure to sudden stops.

Debt managers are often preoccupied with the issuance of sovereign guarantees and accounting for related contingent liabilities. Many have expressed concern that they have imperfect visibility of debts contracted by state-owned enterprises or other government agencies, despite their potentially large impact on borrowing limits. These debts are often not reported to the debt management office (or Ministry of Finance) and are therefore difficult to monitor. Adjustments to the accounting of contingent liabilities based on credit analysis may be made in developed economies, but not always applied elsewhere.

Finally, it should be noted that many preconditions for developing robust capital markets are out of the control of the debt manager, including (i) political stability and government credibility; (ii) macroeconomic stability and confidence about the course of inflation; (iii) prudent fiscal policy; (iv) financial controls; (v) domestic savings rates (and more broadly the depth of financial inclusion); (vi) domestic institutional investor base; (vii) government discipline over the issuance of debt (and sovereign guarantees); and (viii) functioning technical and regulatory infrastructure. However, debt managers can have a profound impact on the development of financial markets by promoting a strong sense of predictability and transparency to stakeholders.

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Reducing Debt Short of Default

Tom Best, Oliver Bush, Luc Eyraud, and M. Belen Sbrancia

1. Introduction

In this chapter we discuss the strategies available to governments seeking to reduce debt. We begin by focusing on the conventional options—fiscal consolidation and growth-promoting policies—before moving to more unconventional means of debt reduction, including debt monetization and financial repression. The most radical options in a government’s arsenal, outright default and debt restructuring, are left for subsequent chapters; but these alternatives loom large, and the desire to avoid them is often an important motive for debt reduction. Throughout we focus on “true” debt reduction, leaving out accounting stratagems that make the fiscal accounts appear stronger than they actually are (IMF 2011).

A. When is public debt reduction needed?

While it might seem obvious that public debt should be reduced from today’s elevated levels, in fact there has been a vigorous debate over whether and when debt reduction is appropriate, particularly in advanced economies. Lower public debt is not desirable for its own sake, but rather because high public debt can generate costs and risks. Debt reduction becomes appropriate when these costs and risks outweigh those associated with debt-reducing policies.

The most pressing argument for debt reduction arises when there is a danger of an acute sovereign debt or fiscal crisis. The economic and political costs of outright sovereign default or debt restructuring are usually

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substantial (see Chapter 7), and even if they can be avoided, high debt levels can expose a country to the risk of an inflation crisis, or the need for sharp policy adjustments at times when the economy is already being buffeted by other shocks.¹ As a result, when the existing level of debt leaves a country facing a considerable risk of a sovereign debt crisis, or when sovereign financing costs are already causing disruption, there is usually a compelling case to pursue rapid debt reduction. Chapter 4 discusses various frameworks to examine whether public debt levels are sustainable, including in relation to “safe” debt levels which can differ based on underlying country characteristics.

Even if outright crisis can be avoided, high levels of public debt can carry other costs, such as the need to levy higher rates of distortionary taxation (Chapter 3). Set against this, public debt can also have beneficial functions, including as a “safe asset” for the financial system. When public debt is above the “optimal” level that balances these costs and benefits, debt reduction is usually warranted, although a much more gradual pace of adjustment is typically appropriate in this case (Ostry et al. 2015, Bhandari et al. 2017). Finally, outside of purely economic considerations, some countries have legislative limits, or targets, for the level of public debt (Chapter 9).

B. The Mechanics of Public Debt Reduction

Once a policymaker has determined that debt needs to be reduced, the next question is what combination of measures should be used to bring about that adjustment. A natural starting point for this discussion is the debt dynamics identity.

The Debt Dynamics Identity

The debt dynamics identity introduced in Chapter 4 describes how the evolution of (gross) public debt depends on key economic and policy variables. There are many forms of this equation,² but we start with a simple version, in which all variables are expressed as a percentage of GDP:

$$(1) \quad \Delta d_t = \frac{1}{1 + g_t} \left(\frac{i_t - \pi_t}{1 + \pi_t} - g_t \right) d_{t-1} - pb_t + sfa_t$$

¹ For example, Romer and Romer (2018) find that countries entering a financial crisis with lower debt-to-GDP ratios tend to have less severe recessions.

² See Appendix A for derivations of this and the other debt -dynamics equations presented in this chapter.

Changes in public debt (Δd_t) depend on the inherited debt level (d_{t-1}), the government's primary balance³ (pb_t), the nominal (effective) interest rate on public debt (i_t), inflation (π_t) and real growth (g_t). As will be discussed, the interest-growth differential $\left(\frac{i_t - \pi_t}{1 + \pi_t} - g_t \right)$ is particularly critical as a determinant of long-term debt dynamics. The final term in this equation, the stock-flow-adjustment (sfa_t) is a residual item, capturing all other factors that affect the debt level, including changes to other government assets and liabilities.

For countries, with foreign currency denominated debt, an expanded debt dynamics equation is useful:

$$(2) \quad \Delta d_t = \frac{1}{1 + g_t} \left(\frac{i_t^d - \pi_t^d}{1 + \pi_t^d} \alpha_{t-1}^{dc} + \left(\frac{i_t^f - \pi_t^f}{1 + \pi_t^f} + \frac{\Delta q_t}{q_{t-1}} \right) \alpha_{t-1}^{fc} - g_t \right) d_{t-1} - pb_t + sfa_t$$

This equation distinguishes between domestic and foreign currency debt, which typically have different nominal interest rates (denoted by the d and f superscripts). A depreciation of the real exchange rate (positive value of Δq_t) increases the debt-to-GDP ratio, with the magnitude increasing in the share of foreign currency debt (α_t^{fc}). As will be discussed, governments typically have less ability to influence real interest rates on foreign currency debt, and are therefore more constrained in their options for debt reduction when this share is large.

The role of economic policies

The dynamics identity provides a lens to consider the four different policies discussed in this chapter:

- *Fiscal consolidation* impacts debt dynamics mainly by increasing the primary balance.
- *Growth-enhancing policies* typically aim at raising the growth rate of “potential” GDP, usually defined as the level of output consistent with stable inflation.
- *Monetary policy* can reduce real interest rates on domestic government debt, generate seigniorage revenues, and may also boost short-term output growth,

³ Defined as the difference between the government's revenues and its primary (non-interest) expenditures.

- *Financial repression* typically acts by reducing the rate of return on domestic government debt.
- Various other policies can also impact debt dynamics, but are not discussed in detail in this chapter. Most prominent are changes in the government's ownership of assets, particularly privatization of state-owned enterprises,⁴ which can reduce gross debt, generate liquid assets for debt service, and potentially generate efficiency gains, but typically has limited effects on government net worth.

In this chapter we explore these four main policy tools in turn, examining the mechanisms by which they affect debt, and discussing effective policy design, informed by the theoretical and empirical literature. However, before moving to a detailed discussion of these policies, a brief review of their relative roles in past reductions is warranted.

C. How have large debt reductions been achieved?

The historical contribution of different policies to debt reductions has varied widely, depending on country circumstances, and the international context. Several historical episodes of public deleveraging were discussed in detail in Chapter 1:

- Defaults in advanced economies were still common prior to the Second World War (Case Study 6.1 discusses the experience in revolutionary France), but non-default debt reductions during this period relied mainly on primary surpluses and were often conducted in the context of modest growth and low inflation.
- In the interwar period, debt overhangs were initially addressed through a mixture of hyperinflation (Germany, Austria), and primary surpluses (France, UK), but ultimately, defaults were widespread (Reinhart and Rogoff 2009).
- The post-Second World War debt reductions relied primarily on very favorable interest-growth differentials thanks to a combination of rapid growth, financial repression, and persistent inflation, while primary surpluses played only a small role.

⁴ Relatedly, sometimes government seek superficial debt reduction by using off-balance sheet financing, for example through public-private partnerships, which can create new and less transparent fiscal risks (Chapter 2).

Case Study 6.1 Fiscal dimensions of the French Revolution

The French monarchy had a chronic public finance problem throughout the eighteenth century and defaulted several times, weakening the nation's credibility in bond markets. French support for the American War of Independence caused the state's debt to balloon, forcing Louis XVI's successive finance ministers to search for solutions that avoided default.

Fiscal consolidation was the Ancien Régime's policy of first resort in the late 1780s. Unable to borrow and with most of its revenue absorbed by servicing existing debt, France could no longer project its military power. Meanwhile various tax reforms were proposed to raise more revenue and limit exemptions in a very complex system. In the end, a national representative body was convened to obtain consent for reforms, setting off a chain of political events which ran ahead of the monarchy's ability to respond and retain power. Before the reforms could come into effect, the existing tax system was de-legitimized and tax yields fell sharply, just as the newly declared Republic was threatened by the fiscal demands of civil war and invasion by foreign powers.

Growth-enhancing policies were recommended by the Physiocrats—leading economists of the day. A free trade treaty was signed with Britain, some internal customs barriers were removed and controls on the grain trade were lifted. Once the Revolution had started, there were further reforms, including increased standardization in measurement and the abolition of guilds. However, any immediate benefit of these changes was obliterated by more than two decades of an economy at war.

Financial repression was an important policy tool throughout the Revolution. When the monarchy lost access to the bond market in 1789, it forced its only chartered bank to provide loans. As the bank expanded credit, its reserves disappeared, leading the government to end convertibility of its banknotes, thus creating fiat paper money. The new money ("assignats") was supposed to be temporary, and in an attempt to sustain credibility, was made redeemable against the purchase of lands confiscated from the Catholic Church. But the fiscal demands of war led to an over issue of paper money, inflation, and ultimately a step-up of financial repression, backed by extreme economic penalties and the political Terror. Price controls were deployed to prevent inflation and briefly bolstered seigniorage revenues in real terms.

Continued

Case Study 6.1 *Continued*

Unsurprisingly, Terror policies lost public support. When price controls were removed, hyperinflation ensued. Historical accounts describe the kind of costs we might expect: distorted relative prices and dysfunctional credit markets, yet there was still no reduction in the state’s debt, as in two steps, the public had the value of their bond holdings adjusted for inflation and consolidated into a single issue. In the end, a major default was necessary in 1797.

This case study draws chiefly on Doyle (1989), White (1989), Sargent and Velde (1995), and White (1995).

More recently, episodes of coordinated debt reduction in emerging and low-income countries were driven primarily by debt restructuring, in the former case mainly through the Brady plan and in the latter through the HIPC initiative. However, there have also been cases of debt reduction without default (Figure 6.1):

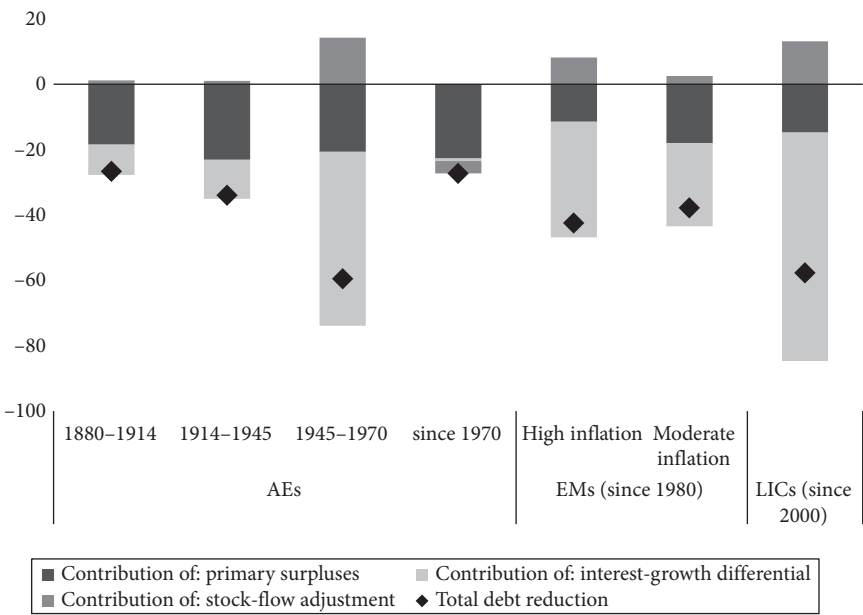


Figure 6.1 Contributions to public debt reduction in non-default episodes (change in public debt as a % of GDP)

Sources: Abbas et al. (2010, 2011); IMF (2018a); and sources therein.

- Since the 1970s, large debt reductions in advanced economies have been infrequent (examples include Ireland and New Zealand from the 1980s, Belgium and Denmark from the 1990s), and have relied primarily on fiscal consolidation (Abbas et al. 2013). Inflation typically fell during these episodes, and average interest-growth differentials were close to zero.
- Since the 1980s, non-default emerging market (EM) debt reductions have generally fallen into one of two broad categories: high inflation episodes (e.g., Poland and Hungary in the 1990s and Serbia in the 2000s), in which negative real interest rates were the main driver of debt reduction; and moderate inflation episodes (e.g., Indonesia and Uruguay in the 2000s), in which real growth rates typically accelerated, and the contribution of primary surpluses and growth to debt reduction was similar (Abbas et al. 2010).
- Non-default debt reductions have been particularly rare in low-income countries, but a recent study (IMF 2018a) identifies seven sustained non-default debt reductions since 2000. The drivers were quite diverse, including rising commodity revenues, high investment levels that delivered strong GDP growth, fiscal consolidation and a combination of high inflation and financial repression.

2. Fiscal Consolidation

Fiscal consolidation is the most direct policy tool by which a government can reduce its debt, generating resources for repayment by raising revenues or cutting expenditures, and, as a result, it often occupies a central role in debt reduction efforts.

Fiscal consolidation—also referred to as fiscal adjustment or fiscal tightening in this chapter—denotes budgetary measures taken by the government to improve its fiscal position and reduce the debt-to-GDP ratio. It has two main characteristics: first, it entails actions taken as part of the budget, that is, revenue-enhancing and expenditure containment measures. Second, it is, by definition, discretionary; an automatic improvement of the government's fiscal position due to favorable economic conditions is not viewed as fiscal consolidation.

At the center of the policy debate on consolidation is how to design a “successful” fiscal adjustment. By successful, the literature generally means three things. First, fiscal adjustment should be *sufficiently large* to put debt on a sustainable path. Second, adjustment should be *durable* and difficult to reverse.

And third, the efficiency cost of consolidation should be minimized; in particular consolidation should not be too detrimental to economic growth. Success depends on a range of factors and characteristics related to the design and implementation of consolidation plans. We organize the discussion around three main pillars: size, speed, and composition of adjustment.

A. Size of the adjustment

The first step in the design of a fiscal consolidation is to determine how much adjustment is needed. For this purpose, fiscal consolidation is generally measured using a “top-down” approach that identifies discretionary fiscal policy as the annual change in the cyclically-adjusted primary balance (CAPB) from one year to the next (Fedelino et al. 2009).⁵

Calculation of the fiscal “adjustment needs”

Practitioners usually adopt a pragmatic approach to compute the required size of the fiscal adjustment. The first step is to determine a reasonable debt target, perhaps guided by the factors mentioned in the introduction. Once this target is determined, the policymaker can calculate the discretionary change in the fiscal position that would bring debt to its target at a predetermined horizon, taking the setting of other policies as given. If the initial fiscal position is weaker than what is needed to achieve the debt target, a fiscal consolidation will at some point be needed.

From an operational point of view, there are various ways of computing the size of adjustment necessary to bring the debt to target. Eyraud et al. (2018) summarizes four alternative approaches to determining the CAPB path (Figure 6.2), depending on whether (i) the debt target is achieved asymptotically in the long term or by a given date; (ii) consolidation is gradual or concentrated in a single year; and (iii) pressures on the fiscal position are expected in the future (for instance due to population aging), which could call for extra buffers upfront. Depending on the approach taken, fiscal consolidation needs will vary; for instance, they would be larger if the debt target needed to be reached sooner or if there were long-term fiscal pressures.

⁵ The main alternative is the “bottom-up” or “policy action approach” (Romer and Romer 2010; Devries et al. 2011), which uses estimates of fiscal measures announced in the budget and other official documents, but this approach has drawbacks, including reliance on the existence of credible official estimates of discretionary policy actions, and a benchmark of “unchanged policy” that is not always clearly defined.

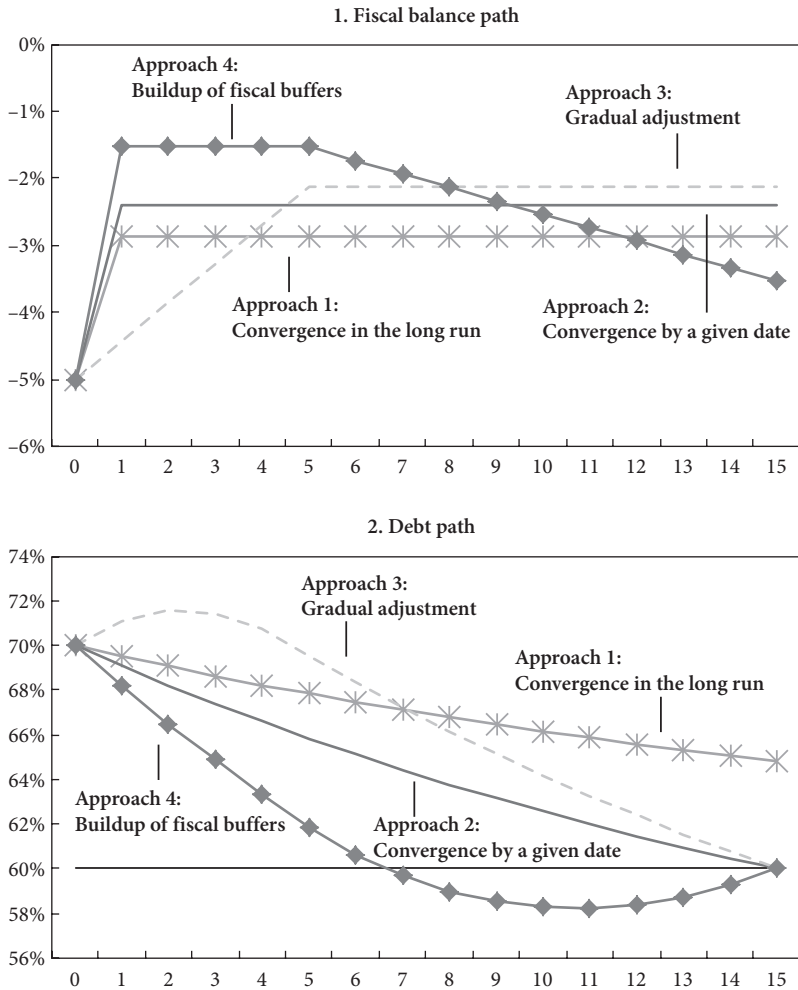


Figure 6.2 Alternative computations of fiscal adjustment needs

Note: Assumptions: nominal growth, 5%; interest rate, 3%; initial debt, 70%; debt target, 60%; initial balance, -5%.

Source: Eyraud et al. (2018).

Relationship between fiscal adjustment and the debt-to-GDP ratio

The discussion in the previous sub-section abstracted from short-term and cyclical considerations. But the relationship between fiscal consolidation and debt is more complicated when the short-term effect of fiscal consolidation on growth is accounted for.

The issue is that fiscal tightening typically reduces GDP in the near-term—in other words the “fiscal multiplier” is usually positive. As discussed in more

detail in the next section, lower GDP reduces the denominator in the debt ratio and triggers automatic stabilizers that limit the improvement in the fiscal balance. As a result, the debt-to-GDP ratio does not decrease one-for-one with fiscal consolidation. The mitigating effect of growth is increasing in the fiscal multiplier, the initial debt ratio, and the automatic stabilizers (Eyraud and Weber 2013).

When fiscal consolidation takes place in a depressed economic environment, fiscal multipliers may be higher than usual (Auerbach and Gorodnichenko 2012), and the adverse effect on GDP may be so strong that fiscal consolidation initially *increases* the debt ratio. If the fiscal consolidation is maintained then the debt ratio will eventually decline, but its slow response to fiscal adjustment can be problematic if financial markets react to its short-term behavior. There is some evidence that this effect is important empirically; for example, Abbas et al (2013) show that in advanced economies since 1980s, large increases in the CAPB are typically associated with rising debt ratios.⁶

These dynamics do not imply that fiscal consolidation is undesirable or that debt is unsustainable. The short-term effect of fiscal policy on economic activity is only one of the many factors that need to be considered in determining the appropriate size of fiscal adjustment. However, ignoring or underestimating multipliers may lead policymakers to set unachievable debt targets and miscalculate the amount of adjustment necessary to bring the debt ratio down in the short-term, sometimes resulting in repeated rounds of tightening. Missing announced targets can impact the credibility of adjustment programs and increase uncertainty about the future path of fiscal policy.

Feasibility of the adjustment

The methods presented above compute adjustment needs without considering whether the adjustment is feasible or not. However, in some cases, the required consolidation may be unrealistically large.

A look at historical precedents can put the required fiscal effort into perspective. Escolano et al. (2014) offer a comprehensive review of the empirical literature on the size of past adjustments. They show a great diversity of results across studies, depending on the criteria and thresholds used to select fiscal adjustment episodes.

⁶ While there is potential for reverse causation here (i.e. primary balances increase in response to shocks that push up on debt, such as a worsening in the interest–growth differential), Grazia Attinasi and Metelli (2016) also find evidence for this effect in an econometric setting (a panel VAR) in which they attempt to control for other factors for a sample of European countries since 2000. They also find that this effect is much stronger with revenue-based than expenditure-based consolidation.

Some studies focus on the *change* in the primary balance while others look at the *level* of the primary balance achieved. Among the first group, a typical finding is that large fiscal adjustments, of 3–5 percent of GDP, are quite widespread, occurring in around half of consolidation episodes (Tsibouris et al. 2006; Guichard et al. 2007; Escolano et al. 2014). Fewer studies focus on the maximum achievable primary balance, but a tentative conclusion from those that do is that high primary surpluses are easier to achieve than to maintain (Escolano et al. 2014; Zheng, 2014). For example, IMF (2013) looks at the maximum primary surplus individual countries have attained since the 1950s, and while the median of this distribution is relatively high at 6½ percent of GDP for advanced economies and 6¼ for emerging market economies, this falls to 3½–4 percent of GDP when considering five-year averages, and declines further to 2¾–3¼ over a 10-year period.

Just as “safe” debt levels may differ by country, the degree of feasible fiscal adjustment can also depend on economic and political circumstances. For example, high and durable fiscal surpluses may have been uncommon in twentieth-century advanced economies in part because of favorable interest–growth differentials, which meant that smaller adjustments were sufficient to stabilize debt (Mauro 2015). Equally, political factors sometimes dominate normative economic considerations in determining fiscal behavior and the evolution of government debt (Yared 2018). In this vein, the political economics literature explores how political institutions can affect fiscal behavior (Chapter 3).

B. Pace and duration of adjustment

So far, we have discussed the *total* size of consolidation, without examining whether the adjustment in the primary balance should be spread over multiple years. However, there has been a lively debate since the global financial crisis about the optimal pace of fiscal adjustment (Corsetti 2012). While the general considerations on adjustment speed discussed in the introduction apply here as well, there are also more practical issues.

Fine-tuning the timing of consolidation is not an option for all countries. Countries facing financing constraints often have no choice but to frontload fiscal adjustment. In fact, the intensity of market pressures is an important determinant of the speed at which consolidation is conducted: the cross-country variation in the pace of adjustment is correlated with differences in sovereign bond yields (Blanchard et al. 2013). But for countries with fiscal

space, getting the pace of consolidation right is perhaps as important as calibrating its size.

Unfortunately, the literature on “successful” fiscal consolidations does not provide clear guidance as to whether upfront adjustment is more or less likely to succeed than gradualism. For example, Tsibouris et al. (2006) find a broad balance between upfront and gradual approaches among a sample of successful adjustments. Similarly, in a sample of European countries, European Commission (2007) does not find a statistically significant link between the likelihood of success and whether fiscal adjustment is gradual or front-loaded.

Given this limited empirical evidence, determining the pace of adjustment is a complex policy decision that should take into account several, potentially conflicting, considerations. Three main factors stand out:

- *Fiscal multipliers*: To minimize the impact on growth, fiscal adjustment should, to the extent possible, be concentrated in years when multipliers are low. The literature on multipliers indicates that they tend to be higher when monetary policy is constrained and cannot offset the fiscal shock; when the financial sector is impaired; and when the economy is in a severe economic downturn (with a high proportion of credit-constrained agents).
- *Credibility and market perceptions*: Excessive back-loading could potentially decrease the credibility of fiscal adjustment, but the empirical evidence in support of “confidence effects” on growth from front-loading adjustment is limited (Perotti 2013). There seems to be a trade-off—smaller deficits tend to reduce government spreads, while lower growth raises them (Cottarelli and Jaramillo 2012). Thus, front-loading fiscal consolidation only delivers an overall reduction in borrowing costs when the direct effect on the deficit dominates the negative effect on economic growth.
- *“Adjustment fatigue”*: Intense fiscal efforts are typically difficult to maintain, both because they have high political costs and because easy-to-implement measures tend to be adopted first. Reflecting this, a longer consolidation period increases the probability of ending and reversing the adjustment, holding the total size of adjustment constant (von Hagen et al. 2001; Tsibouris et al. 2006; and Guichard et al. 2007).

When fiscal consolidation occurs over a relatively long period and is back-loaded, fiscal institutions are essential for setting a credible medium-term plan.

This plan could include some measures—such as a pension reform increasing the retirement age—that address the large pressures from age-related spending without reducing aggregate demand in the near term. Successful fiscal consolidation has typically been accompanied by institutional reforms: several countries introduced fiscal rules, reformed intergovernmental fiscal arrangements (IMF 2009), or established medium-term expenditure frameworks to help governments set and meet multiyear priorities and build credibility in the context of adjustment plans (Tsibouris et al. 2006). Sweden provides an illustration (Case Study 6.2).

Case Study 6.2 Fiscal consolidation in Sweden in the 1990s

Sweden experienced a deep economic and fiscal crisis in the early 1990s in the wake of a property crash and resultant bank solvency problems. The government fiscal balance turned from a surplus in 1990 to an 11 percent of GDP deficit in 1993. Gross debt doubled from 50 percent of GDP in 1990 to 100 percent of GDP in 1996 (Statistics Sweden 2007). In the second half of the 1990s, a prompt economic recovery and the elimination of budget deficits contributed to a halving of the public debt ratio.

In the initial phase from 1993 to 1998, the government achieved a substantial front-loaded adjustment, largely through cuts to government expenditures. At the same time, a new fiscal framework was introduced in 1996, and supported the maintenance of primary surpluses through the early 2000s. The new framework was built around four core elements (Caselli et al. 2018): (1) a multi-year expenditure ceiling for the central government, which includes a budget buffer to deal with unforeseen cyclical expenditures; (2) a budget surplus target for the general government of 1 percent of GDP to be achieved on average over the business cycle; (3) a balanced budget requirement for local governments (with the possibility to set rainy day funds); and (4) a pension system designed to be self-financed and sustainable through automatic adjustments.

Favorable cyclical conditions also supported the fiscal adjustment (Flodén 2013). Economic growth was boosted by a sharp depreciation of the Swedish krona combined with strong momentum on export markets. The export-led recovery facilitated crisis management and reduced the economic and political costs usually associated with fiscal austerity.

C. Composition of adjustment

A key ingredient for the success of a fiscal adjustment is the choice of policy measures supporting it. In some cases, policymakers opt for quick fixes, because they face constraints that preclude the implementation of high-quality reforms—for instance, when an immediate fiscal tightening is needed to avoid an imminent debt crisis. However, under normal conditions, fiscal adjustment is more likely to be successful when it is supported by measures perceived by markets and the population as durable and growth-friendly.

There is no one-size-fits-all prescription to improve the quality of adjustment. Reforms must be tailored to country circumstances, particularly initial fiscal conditions. For instance, many advanced economies with high taxation levels have focused on expenditure containment after the stimulus of 2009–10, partly because of pressures from population aging on entitlement spending and limited scope for tax increases (IMF 2012). In low-income countries, tax ratios are often very low, leaving ample room for greater revenue mobilization.⁷

The economic literature has established some general principles that are relevant when determining the composition of consolidation. Three aspects in particular are important in assessing the policy mix: its impact on short-term growth; its effect on long-term growth; and its implications for the durability of the adjustment

Impact on short-term growth

Perhaps the most common criterion used in assessing the cost and quality of a fiscal adjustment is its impact on short-term growth.

There is a large debate in the literature on whether growth is more impacted by revenue or spending measures. The literature on “expansionary fiscal contractions” argues that expenditure-based fiscal adjustments are less recessionary and could even be expansionary (e.g., Alesina and Ardagna 1998, 2010), but recent research has disputed this finding (Guajardo et al. 2014). The model-based and empirical literature on fiscal multipliers tends to support the opposite conclusion—that government spending has a larger impact on economic activity than revenue measures (see literature reviews in Mineshima et al. 2014 and Ramey 2016). The lower revenue multipliers

⁷ See Besley and Persson (2014) for a discussion of the reasons for these low tax ratios, particularly the link between development and the State’s capacity to tax. Fenochietto and Pessino (2013) model country-specific tax capacity empirically.

are often explained with reference to basic Keynesian effects, under which households accommodate part of any increase in the tax bill by reducing their savings, and therefore do not reduce spending by the full amount of the tax increase. Economic theory suggests that revenue multipliers are likely to be particularly low if the underlying measures are temporary and do not affect permanent income, and if agents are forward-looking and are not liquidity constrained.

When it comes to specific revenue and spending instruments, the comparison of multipliers becomes even more tricky. Structural macroeconomic models, provide a hierarchy of fiscal instruments (European Commission 2010; OECD 2010; Coenen et al. 2012; Kilponen et al. 2015). On the spending side, investment has the highest short-term multiplier, followed by government wages and government purchases, while untargeted transfers to households are associated with the lowest output impact among spending instruments. On the revenue side, the ranking of taxes reflects their perceived distortionary effects: corporate income taxes and personal income taxes have the most negative effects on GDP; consumption taxes do relatively better; and property taxes seem to be the most growth-friendly instrument. However, it is more difficult to identify robust differences between instruments in the empirical literature. The few available studies point to a ranking quite different from the model-based hierarchy (Batini et al. 2014). They suggest that labor income taxes are associated with larger multipliers than corporate income taxes; and that increases in consumption taxes are associated with sizeable short-term output losses. There is also no clear evidence that government investment is associated with larger multipliers than government consumption in advanced economies (Perotti 2004).

Impact on long-term growth

Short-term growth impacts should not be used as the sole determinant of the fiscal adjustment mix; long-term effects on potential output should also be taken into account. While spending multipliers may be higher than revenue multipliers in the short term, the opposite could be true in the long term, owing to supply-side effects. For instance, raising labor taxes may have small multiplier effects in the short run (relative to expenditure cuts) but can reduce work incentives and have adverse effects in the longer term. Similarly, reducing unemployment benefits could have a significant negative short-run impact during a downturn but could eventually lead to higher participation rates and employment in the long-term.

From a long-term perspective, it seems that both revenue and spending measures can bring growth benefits when aimed at reducing inefficiencies (IMF 2015a):

- Broadening the tax base and cutting tax exemptions can enhance the overall efficiency of the tax system by creating room for cutting rates (reducing deadweight losses from taxation) and removing incentives for taxpayers to change their behavior to take advantage of the tax reliefs.
- Similarly, improvements to the efficiency of spending would enhance the delivery of essential public services while saving resources. Durable cuts in unproductive spending can also boost market confidence and foster the credibility of fiscal adjustment.

Durability

Another criterion to consider when selecting consolidation measures is whether they are durable and difficult to reverse.

Fiscal adjustment is more lasting when attained through structural reforms that reflect well-thought-out strategic choices on the role of the public sector. An examination of fiscal adjustment efforts in the main advanced economies during the past few decades shows that adjustments were more successful when based upon reviews aimed at reducing inefficiencies and reorienting the role of government, rather than across-the-board cuts (Mauro 2011).

Although early studies had argued that expenditure-based consolidations were more durable (Alesina and Perotti 1996; Alesina and Ardagna 1998, 2010), more recent evidence shows that revenue-based adjustments can be equally lasting when they rely on increases in tax rates or broadening of tax bases (Mauro 2011). Large adjustment efforts are also found to be more successful when they include revenue-enhancing measures that avoid inefficient across-the board expenditure cuts (Baldacci et al. 2012).

3. Growing out of Debt

Of the many ways of escaping a debt burden, surely the most attractive is to focus on growing the economy. While many of the other policies considered in this chapter are associated with significant costs, raising growth sounds like a “free lunch” that raises welfare at the same time as it erodes the debt burden. Unfortunately, for low- and middle-income countries at least, successful debt reductions driven by higher growth are relatively rare (Reinhart et al. 2003).

Indeed, as discussed in Chapter 3, countries with higher public debt have typically experienced lower future growth rates, even if the extent of causality underlying this relationship is disputed.

In this section, we begin by exploring the mechanisms through which higher growth can reduce debt, and the potentially mitigating role of interest rates, before discussing some of the policy options and considerations for governments seeking to raise growth.

There are two main channels by which increases in economic growth can contribute to debt reduction. First, growth boosts the denominator in the debt-to-GDP ratio. In the context of equation (1), this effect operates through an improvement in the interest–growth differential. Since this differential affects the change in debt in *every* period, persistent shifts in the GDP growth rate are compounded, and have powerful implications for long-term debt dynamics, with the size of the effect increasing in the initial ratio of debt-to-GDP.

A second effect occurs indirectly, via the primary balance. Higher real growth boosts the government’s revenue base without generating expenditure pressures, at least in the short run, and reduces counter-cyclical expenditures such as unemployment benefits. As a result, increases in growth generate an “automatic” improvement in the primary balance, without any active changes to tax or expenditures policies. The size of this indirect effect depends on the size of the automatic stabilizers, which can often be well-proxied by the revenue-to-GDP ratio.

Illustrative simulations show that increases in growth rates could potentially generate sizeable debt reductions through these two channels, particularly for the most indebted economies (Figure 6.3). A 1 percent increase in GDP growth in the period 2019–28 (amounting to a 10 percent increase in the level of GDP) would have the largest impact in advanced economies, because of their high debt levels and automatic stabilizers, reducing public debt by an average of 5 percent of GDP through the interest–growth differential, and a further 18 percent through the primary balance. The average debt reductions in EMs and LICs would be lower, but still substantial.

A. Growth and interest rates

In the foregoing, we assumed that increases in the GDP growth rate translate one-for-one into changes in the interest–growth differential. However, this link merits further discussion, since many economic models predict a relationship between interest rates and growth.

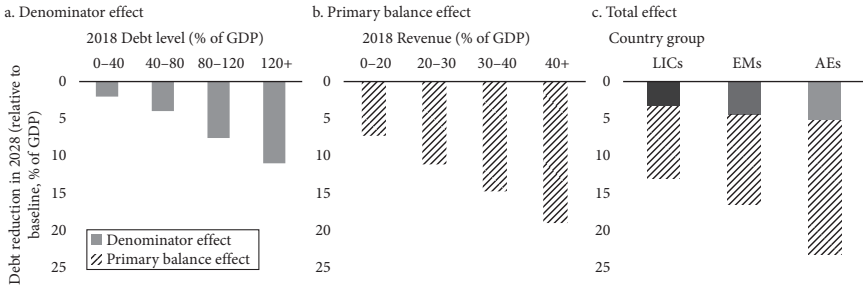


Figure 6.3 Impact on debt of a 10% increase in GDP by 2028 (% of GDP)

Note: The baseline debt-to-GDP ratio in 2028 is constructed using the debt dynamics identity (1), and WEO projections to 2023, holding variables at their 2023 values thereafter. Simulations report the reduction in the public debt resulting from a 1% increase in GDP growth rates from 2019 to 2028. The “denominator effect” is calculated holding all variables except real GDP growth constant. The “total effect” also captures the impact of growth on the primary balance, using the methodology of Mauro and Zilinsky (2016). Sample includes 173 countries, bars show average effects for the countries in each category.

Source: IMF (2018b) and authors calculations.

In the neo-classical growth model,⁸ there is a tight connection between the long-term growth rate and the equilibrium real interest rate. Indeed, under certain assumptions⁹ this framework implies that interest rates fluctuate one-to-one with growth rates, so that changes in long-term growth have no implications for the interest–growth differential. However, there are good reasons to doubt the relevance of this result in practice. First, in open economy models with some degree of financial integration, equilibrium interest rates are typically determined at the global level, so that the influence of an increase in growth in any individual economy is limited (Eggertsson et al. 2016). Second, many policies that would boost GDP would deliver only transitory boosts to growth, and so may not have implications for the equilibrium interest rate. Finally, even when there are changes in global growth, the relationship with interest rates is probably not one-to-one.¹⁰

Empirically, the link between movements in real interest rates and growth rates appears quite weak, and there is evidence of both large cross-country differences and shifts over time (Hamilton et al. 2016). For example, after rising sharply during the early 1980s, real interest rates in advanced economies have

⁸ The benchmark representative agent neo-classical growth model is known as the Ramsey–Cass–Koopmans model. See e.g. Romer (2019) for an exposition.

⁹ In particular, if household’s intertemporal elasticity of substitution in consumption is equal to one.

¹⁰ For example, Rachel and Smith (2017) argue that a 1 percentage point increase in global productivity growth could increase interest rates by 2 percent, so that debt dynamics would actually deteriorate, while Mehrotra (2017) finds a similar effect in a quantitative lifecycle model calibrated to the United States.

fallen substantially in the last three decades, and by more than long-term growth according to most accounts (Holston et al. 2017). Indeed, other factors besides expected growth can have implications for real interest rates, and can drive variation in the interest–growth differential. Candidates include demographics (Gagnon et al. 2016), changes in market power (Eichengreen 2015), inequality (Rachel and Smith 2017), risk premia (Del Negro et al. 2017), and public debt levels (Rachel and Summers 2019). We will discuss one further factor, financial repression in Section 5.

B. Boosting economic growth

Having made the case that economic growth can contribute to successful debt reductions, a next step is to consider what policies can deliver higher growth.

In this section, we focus mainly on supply-side measures to boost medium- and long-term “potential” output, indeed, some of the policies discussed may even have adverse short-run effects on growth. While demand management policies that boost short-term growth can help offset some of the costs associated with debt reduction, their impact on medium-term debt-to-GDP is usually limited, and the main instruments, fiscal and monetary policy, are discussed in Sections 2 and 4.

A useful framework to examine the impact of different growth-enhancing policies is the growth accounting decomposition developed by Solow (1957) and others, which separates the drivers of economic growth into three components: labor supply growth; physical capital accumulation; and a residual, often called total factor productivity (TFP).

Applied growth accounting exercises typically find that while human capital (10–30 percent) and physical capital (around 20 percent) help explain cross-country GDP differences, residual TFP (50–70 percent) is the most important factor, particularly when it comes to the differences between advanced and developing countries (Jones 2016). One implication of these exercises is that the scope for structural reforms to deliver a large boost is larger for emerging markets and developing countries than for advanced economies, since their levels of capital per worker are typically lower, and their distance to the global “technological frontier” is much greater.

The literature on large “growth accelerations” (Hausmann et al. 2005a; Berg et al. 2012) generally supports this conclusion; large, sustained increases in growth in the countries currently classified advanced are infrequent, particularly since the 1970s. Growth accelerations are more common among

developing countries, but a chastening finding is that these growth accelerations are quite unpredictable. While economic reforms increase the *probability* of experiencing a growth acceleration, only a minority of reform episodes ultimately result in a sustained pick-up in growth.

The growth accounting framework suggests separating policies to boost long-term growth into three broad categories: (i) those that boost the size and skills of the labor force; (ii) those that seek to boost investment and therefore promote accumulation of physical capital; and (iii) policies to boost the allocation of capital and labor both across and within industries, and encourage the development and adoption of new technologies. We briefly discuss some of the main policy instruments in each of these areas, many of which fall under the category of “structural reforms,” although a full survey of possible channels and impacts is beyond the scope of this chapter.¹¹

A first set of reforms aims to increase the size and skills of the labor force:

- *Policies to reduce structural unemployment* usually focus on increasing the demand for labor and boosting unemployed workers’ ability and incentives to find jobs, for example through reforms to unemployment benefits and the labor-tax wedge.
- *Measures to boost labor force participation* often target under-represented groups such as women, young, and older workers, and include enhancements to child-care provision, youth-specific minimum wages, and increases in state retirement ages.
- *Improving the skills and health of the workforce* through enhancing health and education systems can deliver growth benefits in the long term, particularly where social returns to education are high.
- *Population growth* is most affected by migration policy in the near term, but some governments have sought to raise fertility rates, often through financial incentives.

A second set of reforms aim to increase the private and public capital stock:

- *Strategies to promote private investment* typically focus on improving the financing and business environment, including reducing barriers to entry.

¹¹ For recent studies with quantitative estimates of returns to various growth-enhancing measures, see for example Ostry et al. (2009) and Barkbu et al. (2012).

- *Increasing public investment* has a direct fiscal cost but should boost GDP. Under certain conditions,¹² public investment can be “self-financing,” in the sense that it reduces the debt-to-GDP ratio in the medium term even if it is financed by borrowing.
- *Improving the efficiency of public investment* could potentially deliver a boost to growth at existing investment rates (IMF 2015c), through better project appraisal, selection, and execution, particularly in developing countries.¹³

A third set of reforms targets the allocation of resources¹⁴ and the use of technology:

- *Strategies to encourage the reallocation of capital and labor* include enhancing the flexibility of labor and product markets, reforms to improve the allocation of resources by the financial sector,¹⁵ and industrial policies.
- *Promoting the development of new technologies* can involve changes to intellectual property laws and encouraging research and development expenditure, for example through tax incentives (IMF 2016).
- *Common strategies to promote the adoption of technologies from abroad* include capital account and trade liberalization, which expose firms to foreign competition and learning opportunities, although empirical evidence on these effects is mixed.¹⁶

Reform prioritization and sequencing

Given the huge variety of policy options, a critical issue for policymakers prioritizing debt reduction is to determine where the potential gains are largest. Some of the studies mentioned above can provide guidance as to the types and magnitude of effects from different policies, but there are likely be large

¹² Including where there are large infrastructure needs (low initial capital stock), cheap government borrowing costs, high fiscal multipliers (high economic slack and accommodative monetary policy), and a high elasticity of output to the public capital stock (Abiad et al. 2016).

¹³ Gupta et al. (2014) find that across low- and middle-income countries, once efficiency is accounted for, only about half of public investment over the period 1960–2009 was translated into productive public capital.

¹⁴ Structural transformation that shifts resources from traditional sectors such as agriculture to the modern economy has often played a key role in large growth accelerations (McMillan et al. 2017), while factor misallocation within industries can also weigh on TFP (Hsieh and Klenow 2009).

¹⁵ A large literature finds evidence for the importance of financial sector reforms; see for example King and Levine (1993) and Galindo et al. (2005).

¹⁶ See Rodrik and Rodriguez (2001) and Eichengreen (2002) for reviews of the literature on trade and capital account liberalization, respectively.

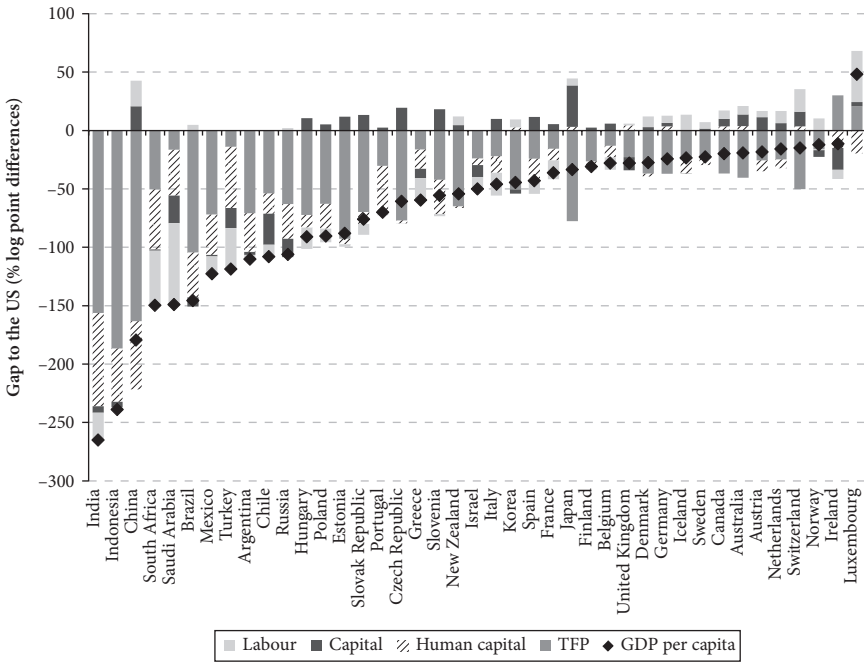


Figure 6.4 Contributions to GDP per capita gaps relative to the United States¹

Note: ¹OECD estimates for 2011 at constant 2005 PPPs.

Source: Johansson et al. (2012).

differences across countries, depending, for example, on their level of economic and financial development and their position in the business cycle.

Results from the growth accounting framework can provide a high-level overview of priority areas (see for example Figure 6.4, from the OECD), but to translate this into practical policy advice, a more granular approach is usually needed. In this regard, institutions such as the IMF, OECD, and World Bank produce country-level assessments of reform priorities. Often these views draw on metrics of existing structural policies, which can be used to identify where gaps to peer countries or international best practice are largest. Alternative approaches include Hausmann et al.'s (2005) "growth diagnostics," which involves determining which distortions are acting as the "binding constraints" to growth in an economic framework.

The short-term impact of reforms may also have implications for sequencing. A recent literature examines these short-term effects and possible interactions with a country's business cycle position, with a focus on advanced economies. This work typically finds that the short-term boost from structural reforms is modest, and that some reforms, such as those to employment protection and unemployment benefits, can even have adverse impacts if

implemented when the economy is already weak (Bouis et al. 2012), or when fiscal and monetary policy are constrained (Duval and Furceri 2018).

Perhaps more important in the context of debt reduction are interactions with fiscal policy. Some reforms, such as cuts to the labor tax wedge, or increased spending on public investment, entail direct fiscal costs. Where the primary motive is debt reduction, the decision to pursue such reforms would need to be grounded in a careful assessment of both direct costs and plausible growth benefits. Where financing constraints are tight, these reforms may need to be implemented in a budget neutral manner, through offsetting savings elsewhere in the budget. Conversely some reforms, such as cuts to unemployment benefits, generate direct fiscal savings, but these could be outweighed by the indirect consequences for growth if implemented when there is substantial economic slack (Banerji et al. 2017). Similarly, when reforms have large distributional impacts, targeted fiscal measures to help offset these consequences may be appropriate.

Another consideration for the design of reforms are the political implications. Reforms that would boost growth may sometimes go against broader societal preferences, for example on inequality or the trade-off between job security for those in work and overall unemployment. Relatedly, an external debt overhang can itself deter the implementation of controversial but growth-enhancing reforms, since much of the benefits will be paid to creditors (Sachs 1989).

Mancur Olson (1965) argued that public policy also suffers from a “collective action” problem; the costs of reform are typically immediate, and concentrated on particular groups in society, whereas the gains are usually more diffuse and take longer to materialize. As a result, the potential “losers” from reform have stronger incentives to lobby politicians against reforms and prevent their adoption.

As such, one way to overcome the obstacles to reform is to attempt to compensate the “losers.” For example, Barry Eichengreen (1996) has argued that during the “golden age” of growth in Western Europe after the Second World War, many countries’ developed “social contracts” in which wage moderation, trade liberalization, increased social insurance, and high investment rates all went together, creating the conditions for rapid catch-up growth.

4. Monetary Policy

In *A Tract on Monetary Reform*, John Maynard Keynes famously set out two ways monetary policy can come to a fiscal policymaker’s aid: first, “by printing

money” and second “by reducing the burden of its pre-existing liabilities in so far as they have been fixed in terms of money” (Keynes 1923). Aggressively using monetary policy for this purpose tends to be a last resort. On printing money, Keynes commented that “a Government can live by this means when it can live by no other. It is the form of taxation which the public find hardest to evade and even the weakest Government can enforce, when it can enforce nothing else.” On reducing the real burden of government debt, he claimed that “it would be too cynical to suppose that, in order to secure the advantages discussed in this section, Governments...depreciate their currencies on purpose. As a rule, they are, or consider themselves to be, driven to it by their necessities.”

This section considers the two chief impacts of monetary policy on government debt sustainability, followed by some more indirect effects. Then it considers the costs of this strategy. Monetary policy also has short-term impacts on real GDP, but this does not *directly* help governments to achieve sustained reductions in the debt burden, so is not discussed here.

A. Seigniorage

In some countries, governments rely heavily on the issuance of central bank money as a source of revenue. Because most central banks do not pay interest on money, they make a profit by holding interest-bearing assets such as government debt and funding themselves with money.¹⁷ Typically, this profit is passed to the government and counts towards government revenue and, along with other types of revenue, can help alleviate the government debt burden. The change in the amount of central bank money—the amount of money printed or credited to the accounts of commercial banks—is known as “seigniorage” and is, on average, close to the revenue earned from issuing money (Buiter 2007).

However, printing money is not a free lunch. If the central bank creates a lot of new money and purchases government debt with it, the public will spend more. In the short run, this might lead to a boom in production and jobs, but after a few years, the main impact is higher prices. The reason printing money is not a free lunch is precisely that those people who held money over the period of inflation have lost out. As Keynes pointed out, this is equivalent to a tax on money, but as discussed below money holders might not be the only people who lose out from higher prices.

¹⁷ Central bank money consists of notes and coins in circulation and deposits held at the central bank by commercial banks. In the last fifteen years, many central banks including the Federal Reserve have started to pay interest on banks’ deposits.

Furthermore, there are limits to the revenue that can be raised by the seigniorage tax. In a famous paper, Phillip Cagan (1956) explained that increasing the rate of money printing is like raising a tax rate. There is a direct effect: a higher rate of tax on existing money holders transfers more funds to the government for any given tax base. However, increasing the tax rate also reduces the tax base:¹⁸ the real value of money in circulation (i.e., money in circulation measured in terms of what it can buy). Higher money growth means higher inflation—money loses its value faster. In response, people try to economize on their money holdings by holding assets which make a return instead; in other words, the tax base shrinks. Above some rate of money printing, the impact on the tax base starts to dominate the direct impact of a higher tax rate, and real seigniorage revenue is at its peak.

Israel is an example of an advanced economy which has experienced high inflation and raised significant seigniorage revenue in the relatively recent past (Figure 6.5). Inflation peaked at over 350 percent in 1984, while seigniorage revenue peaked at 8 percent of GDP. *Total* seigniorage was boosted by mandatory reserve requirements, which when used in this way are a form of financial repression. It is hard to force residents to hold currency, so seigniorage revenue from currency issuance can be used to estimate how large this source of revenue would have been in the absence of repression. This peaked

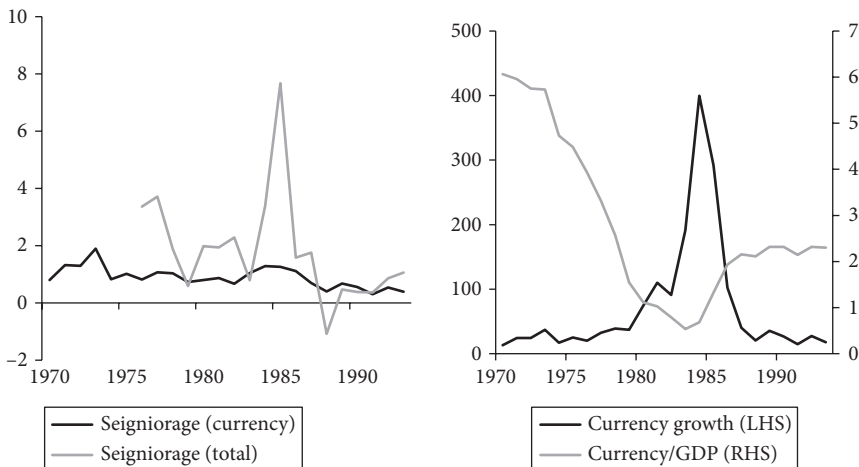


Figure 6.5 Seigniorage and currency in circulation in Israel

¹⁸ Real central bank revenue = $\frac{R}{P} \approx \frac{dM}{P} \approx \frac{dM}{M} \times \frac{M}{P}$, i.e. real central bank revenue is approximately equal to growth in central bank money (the tax) times the real value of central bank money (the tax base).

at around 2 percent of GDP, a relatively modest share of total government revenue. In Figure 6.5, Panel B shows that the size of the tax base (the currency to GDP ratio) fell as currency growth rose, consistent with Cagan's theory.

Economists have tried to measure the rate of inflation (and thus money growth) that maximizes seigniorage revenue. Cagan, studying the interwar hyperinflations, found that this rate was between 10 and 60 percent *per month*. He reported that the amount of seigniorage revenue collected during periods of hyperinflation varied between 0.5 and 20 percent of national income per year. Other economists have estimated that in modern high inflation and hyperinflation episodes, seigniorage peaks at around 6 percent of national income per year, when the rate of inflation is around 170 percent per year (Fischer et al. 2002).

Why is there so much variation between different estimates of the rate of inflation which maximizes seigniorage, and the maximum value of seigniorage itself? Ultimately the peak rates depend on how much people try to economize on money holdings when inflation rises, which varies across countries and over time. In countries with high financial development and literacy, people are likely to be more sensitive to changes in inflation. Another factor is the degree to which the government forces people to hold money, for instance via reserve requirements, and the extent to which any central bank liabilities pay interest.

B. Inflating away

Central banks can also reduce the debt burdens of governments which have issued debt denominated in domestic currency. By engineering a surprise increase in inflation, they can reduce the real value of domestic currency debt, "inflating it away." Just as in the case of seigniorage, inflating away debt is a form of tax, but in this case, the tax base consists of the holders of government debt.

Debt dominated in domestic currency can in principle be inflated away completely: the central bank would just need to set the interest rate at zero and wait until the price level becomes arbitrarily high. Less extreme cases raise an interesting question: how much inflation, for how long, is needed to reduce the real value of debt by any given proportion?

If we make some simplifying assumptions,¹⁹ the analysis is straightforward: the amount and timing of inflation depends on the maturity of the debt. The crucial insight is that inflating away can happen so long as inflation turns

¹⁹ Expectations are rational, prices are flexible, and investors have a free hand. See Reis (2017) for a formal analysis of this simple case.

out higher than investors expected when the debt was issued. When the central bank starts to inflate away, inflation expectations, and therefore interest rates, rise. So debt issued after the central bank changes policy is protected against higher inflation; in the debt dynamics identity, both i and π rise. Once debt is redeemed and new debt is issued to replace it, the opportunity to inflate away is over.

If the maturity of government debt is short-term, there must be a short burst of high inflation to inflate away a significant portion of the debt before it is redeemed and replaced.²⁰ If debt is very long-term, the central bank can either engineer a short burst of high inflation or it can inflate away the debt more gradually. If there is a mixture of short- and long-term debt, the central bank still has some flexibility, but gradual inflation implies more inflation overall.

Most of the debt reduction associated with inflationary policies comes from surprising investors, but they can also contribute to debt reduction through two other channels. First, to the extent that a central bank promotes inflation by reducing interest rates, the government may benefit from lower real interest rates on newly issued debt for a period. Second, in so far as these policies deliver a temporary boost to economic activity, the government's fiscal position will be improved by the operation of the automatic stabilizers.

Work by Michael Krause and Stéphane Moyen (2016) sheds light on these issues in a more realistic setting. They use a calibrated model to investigate the impact of temporary changes in the inflation target on the US government debt burden. Figure 6.6 shows the results of simulations using their model.²¹ In each simulation, the inflation target is raised sufficiently high to reduce government debt by 20 percent of GDP over a period of 10 years. The chart shows the peak rate of inflation and the average rate of inflation over those ten years.

In the baseline simulation, prices are sticky, the average debt maturity is just over five years, the public's expectations are rational, and the increase in the inflation target is quite persistent. Under these assumptions, inflation rises from 2 percent to a peak of almost 12 percent and then falls back slowly, averaging almost 7 percent per annum over the ten years.²² If instead prices are quite flexible, the peak in inflation required to reduce the debt by 20 percent of GDP almost doubles. Longer debt maturity reduces the required rate of inflation, while shorter debt maturity increases it. If investors are slow to learn

²⁰ This analysis assumes that debt has a fixed coupon.

²¹ For details see Appendix B.

²² Hilscher et al. (2018) show that financial markets put a very low probability on this much debt being inflated away. Furthermore, they account for the fact that a significant portion of US government debt is not held by the private sector. This is a caveat to the simulations here.

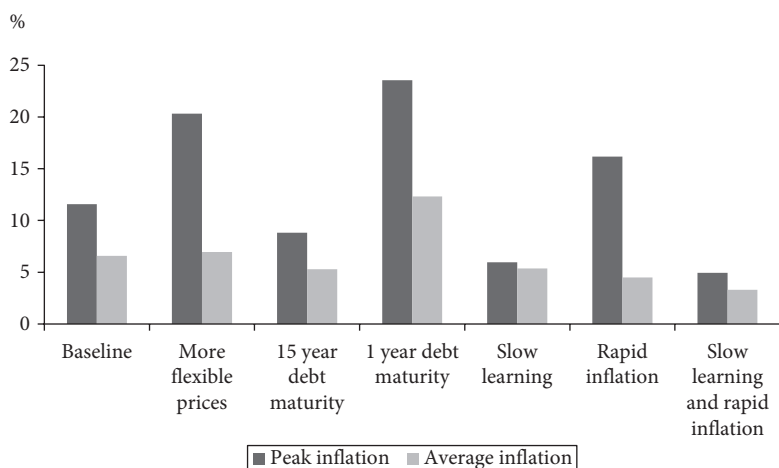


Figure 6.6 How much inflation is needed to reduce government debt by 20% of GDP?

Sources: Krause and Moyen (2016) and authors' calculations.

that the central bank is trying to inflate away, the peak rate of inflation is halved. If it decides to inflate away quickly, then the peak rate of inflation rises to 16 percent, while the average is lower than in the baseline simulation (4.5 percent compared to almost 7 percent). Strikingly, if the central bank tries to inflate away quickly and the public doesn't realize straight away, both the peak and the average rates of inflation are lower, because more of the inflation that does occur is unexpected.

Debt denominated in foreign currency or a commodity such as gold cannot be inflated away. Many emerging market governments have a mixture of both domestic and foreign currency debt. In these countries, the impact of unexpected inflation on the government debt burden is commensurately lower, and raising inflation can be very difficult to manage. The exchange rate, and hence the local currency value of foreign exchange debt, tends to depreciate ahead of any rise in nominal GDP. So there is a period in which the ratio of debt to GDP may *rise*. It is possible that the country might be pushed into default before the increase in nominal GDP brings the debt to GDP ratio back down.²³

Seigniorage and inflating away are distinct concepts, but in practice they often occur together. When there is a surprise rise in inflation, this tends to be

²³ Radelet and Sachs (1998), Corsetti et al. (1999) and Aghion et al. (2000) discuss related issues.

accompanied with higher money growth. So long as both debt and money are denominated in local currency, both effects will operate.

C. The impact of inflation on the primary balance

Beyond the impact on seigniorage revenues already discussed, inflation can also affect other government revenues and expenditures (as a percentage of GDP). As a result, the seigniorage maximizing level of inflation may not coincide with the inflation rate which maximizes the primary balance.

First, high inflation can reduce real wages paid by the government if they are not indexed to the price level. Second, if the tax system is progressive (i.e., people with higher incomes are subject to higher tax rates), then higher inflation automatically moves people into higher tax brackets. If tax brackets are not changed in response, this results in an improvement in the ratio of the primary balance to GDP. Conversely, inflation can also worsen the fiscal position because of tax collection lags. Taxes are normally paid after the income used to calculate the tax liability is earned. When prices are rising rapidly, this reduces the ratio of tax payments to GDP because the taxes were calculated on the basis of income earned when prices were significantly lower. This is known as the *Olivera–Tanzi effect* (Olivera 1967; Tanzi 1977).

D. The costs of inflation

Central banks can, and have, used monetary policy to reduce the government debt burden., but this strategy has costs and, as Keynes suggested, does not tend to be a first resort. Economists have suggested a number of reasons why inflation is costly (Table 6.1). Many of these costs are associated with lower GDP, which acts as a brake on any boost that inflation gives to the fiscal position.

Inflation can lead to distorted prices in the economy, impeding the efficient allocation of resources, although the importance of this effect is disputed. If many prices are “sticky” in absolute terms, then when inflation is higher, the relative price of these goods falls rapidly, even when not merited by changes to underlying supply and demand conditions (Schmitt-Grohé and Uribe 2004). Alternatively, if prices are flexible, but people are slow to learn about inflation; then anticipated high inflation does not distort relative prices, but surprise inflation is costly (Ball et al. 2005). A third possibility is that companies

Table 6.1 Costs of inflation

Type of cost	Assumption	Costs of inflation?	
		<i>if anticipated</i>	<i>if unanticipated</i>
Distorted prices	Time-dependent price stickiness	Yes	Yes
	Time-dependent information stickiness	No	Yes
	State-dependent price/information stickiness	Minimal	Minimal
Money holding too low	Money pays interest	No	No
	Money pays no interest	Yes	No
Lending too low/in other currencies		No	Yes

change prices more frequently when the benefits of doing so are higher, for instance because inflation is elevated (Burststein and Hellwig 2008). Recent evidence is consistent with, but does not unambiguously support, the third view, suggesting that this particular cost of inflation is not very high, at least at moderate levels of inflation (e.g., less than 50 percent per annum).²⁴

A second cost stems from the fact that a higher seigniorage tax reduces the real value of money in the economy. Because people *choose* to hold money, we can infer that they value holding it. A higher tax on money holding therefore has real costs.²⁵ However, temporary *surprise* increases in inflation should have a much smaller impact on people's decision to hold money and therefore should be far less costly (Chari et al. 1991).

The third cost arises from the impact of surprise inflation on financial markets. Investors who are uncertain about future inflation are less inclined to purchase financial assets denominated in domestic currency, so that countries with histories of high and volatile inflation have poorly developed domestic currency bond markets (Jeanne 2005; Burger and Warnock 2006). Governments and companies in these countries are forced either to borrow in foreign currency or to abstain from borrowing altogether. Countries with a history of high and volatile inflation are also more likely to index wages to

²⁴ See e.g. Gagnon (2009), Nakamura et al. (2018), and Alvarez et al. (2019) for evidence based on movements in individual prices and Dornbusch et al. (1990) who present indirect evidence for a range of high inflation economies.

²⁵ E.g. Lucas (2000) and Burststein and Hellwig (2008) find that a permanent 10 percentage point increase in inflation has costs equivalent to reducing consumer spending by 1–2 per cent forever. Milton Friedman argued that the safe short-term nominal interest rate should be zero on average to minimize this cost.

prices, which makes it costlier for monetary policy to bring inflation back down (Dornbusch and Fischer 1993).

Although there is no consensus about the costs of moderate inflation, episodes of very high inflation *do* appear to have large costs. It is hard to demonstrate convincingly that very high inflation depresses output, but researchers have found *correlations* consistent with the claim: economic performance tends to be weak during periods of very high inflation and to improve during large reductions in inflation (Fischer et al. 2002).

Just like sovereign default, inflation has political costs as well. While tighter fiscal policy tends to be unpopular, at least it tends to be agreed through a democratic process. Sovereign default and inflation lack this legitimacy because they rely on the authorities fooling the people. In a fascinating survey, Robert Shiller (1997) found that one reason inflation is disliked is that people feel it is an attempt to trick them. Consistent with this, political leaders are twice as likely to lose their jobs following a rapid loss of value of the currency, which is almost always accompanied with high inflation (Frankel 2005).²⁶

5. Financial Repression

Financial repression, typically in combination with inflation, has been an effective means through which governments have reduced debt in the past. Like monetary policy, this mechanism is most relevant when debt is denominated in local currency. However, a critical difference is that financial repression can reduce debt even when inflation is fully anticipated.

This section starts by defining financial repression,²⁷ a term that carries negative connotations but that is part of the history (and present) of both emerging and advanced economies. We then present a conceptual framework that clarifies the mechanisms through which financial repression can reduce debt. The second part of this section discusses the post-Second World War period, in which financial repression was particularly prevalent. Finally, we

²⁶ Some economists have argued that monetary policy should act forcefully to offset completely shocks which affect the fiscal position (see Leeper and Leith 2016). A problem with this proposal is that the government might not be able to commit to an appropriate fiscal policy knowing that the central bank will provide it with insurance. A halfway house is for monetary policy to offset shocks to government debt dynamics over which the government has relatively little control such as productivity growth, as for example is implied by nominal GDP targeting.

²⁷ This section draws largely on Reinhart et al. (2011), Sbrancia (2012), and Reinhart and Sbrancia (2015).

discuss regulatory changes since the recent crisis, which arguably bear some of the hallmarks of financial repression.

A. What is financial repression?

The term financial repression was coined by Edward Shaw (1973) and Ronald McKinnon (1973). While it has traditionally been applied to emerging economies, similar policies also have an extensive history in advanced economies (Reinhart and Sbrancia 2015). One way to better understand the concept is to think of financial regulation as a continuum between a fully financially liberalized regime and a fully financially regulated/repressed regime. Perhaps unsurprisingly the optimal degree of financial regulation depends on country characteristics and will, for most countries, lie somewhere between the extremes.²⁸

What type of policies can be considered financial repression? To narrow the discussion, we focus on policies and regulations which create frictions in financial markets or introduce significant participation by non-market players. Importantly, while some of these policies are directly motivated by a desire to reduce government borrowing costs, in other cases the impact on government debt markets is a side-effect of policies introduced for other reasons.

The list of potential financially repressive policies is large. Most relevant are policies which create captive audiences for government debt which, when there are limits to arbitrage, allow the government to issue debt at a rate below what the market would charge absent restrictions. Restrictions on banks are a common form of financial repression, including ceilings on interest rates, direct lending, and reserve requirements.²⁹ Capital controls are a form of financial repression in their own right, but can also increase the scope for other repressive policies to reduce borrowing costs, by restricting the ability of investors to arbitrage across countries. In some cases, governments can use moral suasion to persuade investors to act in a certain way without imposing explicit restrictions.

There are two main channels through which inflation can reduce debt: unanticipated inflation, and financial repression combined with inflation.³⁰

²⁸ See for example, Bai et al. (2001), Chari et al. (2018).

²⁹ When required reserves are not remunerated, reserve requirements are similar to a forced interest-free loan from banks to the government.

³⁰ This framework can be extended to incorporate changes in the market value of debt as an additional channel (see Sbrancia (2012) for details).

The conceptual framework developed by Reinhart and Sbrancia (2015) distinguishes between these effects by focusing on the contribution to debt dynamics of three distinct real interest rates. The first two rates are the “ex-ante real-interest rate” anticipated by investors $\left(r_t^A = \frac{i_t - \pi_t^e}{1 + \pi_t^e}\right)$ at the time they purchase government bonds, and the “ex-post real interest rate” $\left(r_t^P = \frac{i_t - \pi_t}{1 + \pi_t}\right)$ actually realized on their investment. The direct effect of financial repression is identified by a third rate, the free market interest rate (i_t^F), the nominal interest rate that would be observed in the absence of financial regulations or official interventions. In turn this can be expressed as a free-market *real* interest rate based on investors’ inflation expectations: $r_t^F = \frac{i_t^F - \pi_t^e}{1 + \pi_t^e}$.

These terms can be incorporated into the government budget constraint, which after some manipulations yields a modified debt-dynamics equation:

$$(3) \quad \Delta d_t = \underbrace{\frac{1}{1+g_t}(r_t^F - g_t)d_{t-1} - pb_t + sfa_t}_{\text{conventional debt dynamics}} - \underbrace{\frac{1}{1+g_t}(1+r_t^A)\frac{\pi_t - \pi_t^e}{1+\pi_t}d_{t-1}}_{\text{Unanticipated Inflation Effect}} - \underbrace{\frac{1}{1+g_t}\frac{i_{t-1}^F - i_{t-1}}{1+\pi_t^e}d_{t-1}}_{\text{Financial Repression Effect}}$$

The first items in equation (3) are the same as those in the conventional debt dynamics identity (1) and show how debt would evolve if the ex-post real interest rate was equal to the free-market real interest rate. However, there are also two additional terms, capturing the impact of unanticipated inflation, and financial repression, respectively.

The “unanticipated inflation effect” was discussed in the previous section, and is the difference between realized and expected inflation multiplied by the real cost of the previous period’s stock of debt, while the “financial repression effect” is the difference between the free market and actual nominal interest rate multiplied by the stock of debt from the previous period. The financial repression effect delivers savings for the government whenever the actual nominal interest rate is below the free market rate.

B. Financial Repression after the Second World War

Following the Second World War, advanced economies achieved substantial reductions from historically high levels of public debt, although in contrast to the post-2008 period, private debt remained low. While government debt

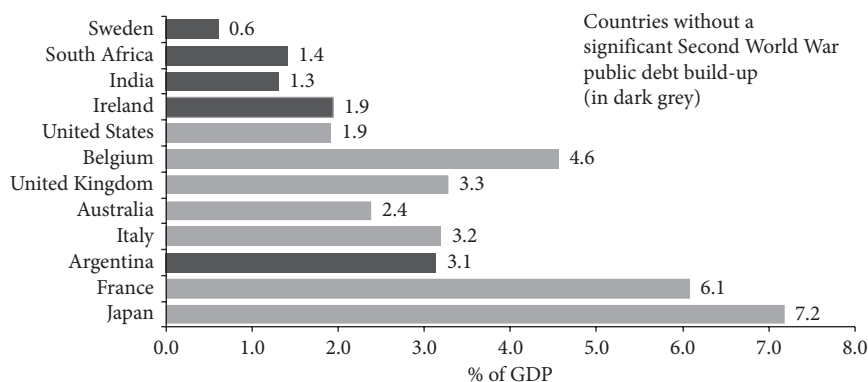


Figure 6.7 “Liquidation effect” revenues per liquidation year as % of GDP

Notes: 1945–80 for Australia, France, UK, United States, South Africa; 1945–80 for Argentina; 1945–74 for Belgium; 1949–80 for India; 1960–83 for Ireland; 1946–80 for Italy; 1945–2008 for Japan and 1945–90 for Sweden.

Sources: Reinhart and Sbrancia (2015) and sources therein.

dynamics were bolstered by strong postwar economic growth, negative real interest rates also played a critical role.

Reinhart and Sbrancia (2015) document the overall impact of negative real interest rates in reducing government debt during this period (Figure 6.7). Most real interest rates were significantly lower during 1945–80 than in the freer capital markets before the depression and Second World War, and after financial liberalization in the 1980s, influenced by an array of repressive policies (Case Study 6.3). For the advanced economies, ex-post real interest rates were negative in about half of the years of the financial repression era, compared to less than 10 percent of the time since the early 1980s. In years when ex-post real interest rates were negative (“liquidation years”), average annual savings ranged from about 1 to 5 percent of GDP for the full 1945–80 period, despite relatively moderate inflation rates (averaging 4.6 percent in the United States and 6.3 percent in the UK). The most significant savings materialized in the decade immediately after the Second World War, when debt levels were highest, and in the 1970s, when inflation accelerated.

Dissecting the precise role of financial repression in this period is challenging, because key elements of equation (3) are unobserved. For example, the equilibrium “free market” real interest rate is unknown, and as discussed earlier in this chapter, may fluctuate for reasons unrelated to financial repression. As an alternative to estimating free-market interest rates, Reinhart and Sbrancia estimate inflation expectations to measure the contribution of unanticipated inflation. They find that unanticipated inflation had a relatively limited impact

Case Study 6.3 Financial repression policies during 1945–1980

The types of financial repression during the postwar period were diverse. In some cases, policymakers imposed direct restrictions in the market for government securities, whereas other policies had a more indirect impact.

France: Formation of “the Circuit”

Policymakers decided that the government should take an active role in directing credit to the sectors of the economy that needed it the most, including ensuring that the government would obtain adequate financing, by establishing what was called “*the circuit*.” This was achieved through policies such as portfolio requirements on banks’ purchases of assets besides government securities; tax benefits on government securities; and isolation of *the circuit* from foreign markets through capital controls.

Japan: Controls on deposit and bond interest rates

Interest rates on government bonds were regulated, with the mechanism differing by type of bond (See Suzuki 1987). For instance, for long-term bonds, “the issue terms were decided by the long-term Government bond facilitation committee *sewanin kai*, which consisted of the Ministry of Finance, the Bank of Japan, and representatives of the underwriting syndicate.” *De facto* most issuance was regulated, even in the absence of a legal requirement.

Deposit rate regulations were common, motivated in part by financial stability concerns. For example, the 1947 Temporary Interest Rate Law set maximum interest rates for bank deposits.

United Kingdom: Cheap money policy and minimum prices for government securities

Domestic financial policy during the War and in its immediate aftermath was designed to obtain cheap money for the government, including through Treasury Deposit Receipts (90-day non-marketable paper sold to banks), tap loans, and arrangements for insurance companies to invest in government securities. Minimum prices on government securities were imposed at the beginning of the war, while interest rates were cut after its conclusion (according to Fforde (1992), this was presented as a “technical adjustment”),

Continued

Case Study 6.3 *Continued*

and the maturing stock of lower-yielding Exchequer Bonds was converted. Several Local Loans at 3 percent were exchanged for irredeemable 2.5 percent bonds.

There were restrictions on issues by British companies and a “virtual prohibition on the issue or purchase of foreign securities” (Michie 1999). Government agencies and banks, such as the Postal and Trustee Saving Banks, substantially increased their government debt holdings in this period.

United States: Price support for government securities

During the Second World War there was an agreement between the Federal Reserve and the Treasury to support the price of government securities in the market. The Treasury had set a structure of return for securities of different maturities, which the Federal Reserve supported by buying and selling securities at par. Once the Second World War was over, there was a consensus that the policy of low interest rates should be continued, which lasted until 1951.

in reducing debt through most of this period, suggesting that financial repression was the more important factor.

Strikingly, the post-Second World War period was also the “golden age” of economic growth. While there were many factors (including postwar reconstruction, favorable demographics, and conditions conducive to catch-up) behind this growth acceleration, it is notable that these forces were not dramatically impeded by the widespread presence of financial repression.

C. Financial repression in the twenty-first century

The financial crisis of 2008 led to both a surge in public debt across advanced economies and an increase in “macroprudential” regulation. Many of these policies have been at least partly motivated by either macroeconomic or financial stability concerns, rather than the desire to reduce government financing costs, but in many cases they bear similarities to those in the postwar period, and that have traditionally been thought of as financial repression. While other factors may also have driven a decline in (“free market”) equilibrium real interest rates since the crisis, it is nonetheless

notable that the incidence of negative real interest rates has increased by a similar magnitude to the Bretton Woods era.

Changes to liquidity and capital requirements have encouraged increased bank holdings of sovereign debt, arguably exerting persistent downward pressure on interest rates. In some cases, similar objectives have been achieved by more explicit direction, such as the 2009 requirement for UK banks to hold a larger share of UK government bonds in their portfolio. Onega, Popov and Van Horen (2016) also present evidence that euro-area periphery banks' holdings of their own sovereign's debts during the crisis were influenced by "moral suasion." While such policies are typically intended to address financial stability, they can also create risks, worsening the "sovereign-bank nexus" when crisis approaches (see Dell'Ariccia et al, 2018 for a recent survey). Even so, in December 2017 after a two-year study, the Basel Committee decided to keep the *status quo* of zero risk weights for national sovereign bonds. Finally, central banks have become increasingly important players in government debt markets, thanks to large "quantitative easing" programs in many advanced economies.

6. Conclusion

This chapter has discussed four distinct areas of government policy which can potentially be used to achieve debt reduction. Each has its own features and potential costs, and as discussed in the introductory section, countries have historically relied on a combination of these policies to reduce debt, with the mix varying in different countries and eras. In this concluding section, we briefly summarize the considerations for a policymaker attempting to determine the relative importance of these policies in their own debt reduction strategy.

Fiscal consolidation is the government's most direct policy instrument to achieve debt reduction and, with the exception of a few hyperinflationary episodes, fiscal surpluses have almost always made at least some contribution to successful debt reductions. However, fiscal policy can raise sharp trade-offs between debt reduction and welfare, both because it changes resource allocation by adjusting expenditures and the burden of taxation, and because of its impacts on GDP and employment. As a result, the timing, composition, and size of fiscal consolidations need to be carefully designed to minimize these trade-offs, and policymakers often prefer to make use of the other policy instruments discussed in this chapter, rather than relying on fiscal adjustment alone.

Growth-enhancing policies are an attractive option for governments, since even relatively modest improvements in GDP growth rates can substantially

improve the prospects for debt reduction and reduce the need for adjustment via other policies. The list of potential supply-side policies is large, but the boost to growth is usually relatively gradual, and the scope for increasing GDP per capita is probably modest for countries already close to the global frontier. For developing and emerging economies, there is potentially larger scope for growth accelerations, regardless of the level of debt, but the returns from particular reforms are often uncertain, and high debt may not be politically conducive to the types of policies required.

Monetary policy can almost always contribute to reducing the government debt burden, through seigniorage and through inflating away for those countries with domestic currency debt. Inflation has costs, particularly for the holders of government debt and money, but so do other options for reducing government debt. Inflating away a sizable proportion of debt requires rates of inflation which are high by recent standards in advanced economies, but hardly unprecedented. Governments without domestic currency debt can only rely on seigniorage, which is associated with much higher rates of inflation, and therefore large costs. But there are limits to what monetary policy can achieve: it cannot generate large amounts of ongoing fiscal support without coercing the public to hold money or domestic currency debt. When the costs are considered alongside those of other policies, a moderate and temporary increase in inflation may sometimes be appropriate as part of a package of measures to reduce the debt burden. Furthermore, a temporary *surprise* period of inflation is likely to be both more effective and less costly than other forms of inflation, particularly if inflation expectations remain well-anchored.

Financial repression to reduce the cost of servicing government debt has been stigmatized as a strategy but has historically been common in both advanced and emerging economies. It is a natural complement of inflationary monetary policies, with which it is frequently used, and like those policies acts as an implicit tax on holders of government debt and money. Some fear negative consequences for growth, particularly in an era of significant global financial integration, but the post-Second World War experience casts some doubt on this supposition, at least at moderate levels of financial repression. While it is hard to anticipate how governments will manage to reduce the current debt overhang, it seems likely that policymakers will be concerned with debt management and the interest cost of their debt for the foreseeable future. In this context, policies aimed at keeping interest rates low and assuring a demand for government paper (financial repression) are likely to remain and may even expand.

Appendix A: Deriving the debt dynamics equations

Debt dynamics with domestic currency debt only

To derive the debt dynamics identity, we start with the government's budget constraint in nominal terms:

$$(A) \quad T_t + D_t = D_{t-1} + i_t D_{t-1} + G_t + SFA_t$$

Where D_t represents nominal government debt, i_t is the nominal effective interest rate on government debt, G_t is government non-interest expenditures, T_t is government revenues (including seigniorage profits received from the central bank).³¹

In practice, the effective interest rate is usually calculated based on the government's (net) interest payments (I_t): $i_t = \frac{I_t}{D_{t-1}}$. For a government that only issues fixed rate debt at par, this in turn will be a function of past nominal interest rates by maturity: $I_t = \sum_j \sum_{m=i}^M i_{t-j}^m D_{t-j}^m$, where O is the age of the oldest outstanding bond, M is the maximum maturity of government issuance, and i_t^m and D_t^m , are the amounts outstanding and interest rates respectively, of debt of maturity m issued in period t . In general, the longer the average maturity of debt $\left(\frac{\sum_{j=1}^O \sum_{m=i}^M (m-j) D_{t-j}^m}{D_{t-1}} \right)$, the more persistent will be the effective interest rate.

The intuition underlying equation (A) is clearest when the government only issues one-year maturity debt. In this case, the items on the left of the equation represent the government's sources of financing, its revenues (T_t) and new debt issuance (D_t). The first three items on the right are the government's financing requirements: principal payments on maturing debt from the previous period (D_{t-1}), interest payments on this debt ($i_t D_{t-1}$), and government non-interest expenditure (G_t). As explained in the introduction, the final item (SFA_t) is a residual, which in practice captures transactions in other government assets and liabilities, and any revenues and expenditures that are not captured in the fiscal data.

If we subtract T_t from both sides of (A), define the primary balance: $PB_t = T_t - G_t$, and divide through by nominal GDP ($P_t Y_t = P_{t-1}(1 + \pi_t)Y_{t-1}(1 + g_t)$), we can express these variables as percentages of GDP (denoted by lower case variables):

$$d_t = \frac{(1 + i_t)}{(1 + \pi_t)(1 + g_t)} d_{t-1} - pb_t + sfa_t$$

Subtracting d_{t-1} from both sides:

$$(B) \quad \Delta d_t = \frac{(1 + i_t) - (1 + g_t)(1 + \pi_t)}{(1 + \pi_t)(1 + g_t)} d_{t-1} - pb_t + sfa_t$$

$$\Rightarrow \Delta d_t = \frac{1}{(1 + g_t)} \frac{(1 + i_t) - (1 + \pi_t) - g_t(1 + \pi_t)}{(1 + \pi_t)} d_{t-1} - pb_t + sfa_t$$

³¹ If the government is consolidated with the monetary authorities, then there would be an additional financing item: $H_t - H_{t-1}$, the change in the monetary base in nominal terms, but government revenues would not include seigniorage profits.

Which can be simplified to equation (1):

$$(1) \quad \Delta d_t = \frac{1}{1+g_t} \left(\frac{i_t - \pi_t}{1+\pi_t} - g_t \right) d_{t-1} - pb_t + sfa_t$$

Defining the (ex-post) real interest rate: $1+r_t^p = \frac{1+i_t}{1+\pi_t}$, and substituting into (B):

$$\Delta d_t = \frac{(1+r_t^p) - (1+g_t)}{1+g_t} d_{t-1} - pb_t + sfa_t$$

Which can be expressed as:

$$(C) \quad \Delta d_t = \frac{r_t^p - g_t}{1+g_t} d_{t-1} - pb_t + sfa_t$$

Equations (B) and (1) in nominal terms, and (C) in real terms, are the standard debt dynamics identities.

Debt dynamics with foreign currency debt

With foreign currency debt, the nominal budget constraint becomes:

$$(D) \quad D_t = (1+i_t^d)D_{t-1}^{dc} + (1+i_t^f) \frac{e_t}{e_{t-1}} D_{t-1}^{fc} + (G_t - T_t) + SFA_t$$

Where e_t is the nominal exchange rate expressed as the foreign currency per unit of domestic currency (i.e., a nominal depreciation is an *increase* in e_t).

We also introduce notation for the shares of domestic $\left(\alpha_t^{dc} = \frac{D_{t-1}^{dc}}{D_{t-1}} \right)$ and foreign currency debt $\left(\alpha_t^{fc} = \frac{D_{t-1}^{fc}}{D_{t-1}} \right)$, and as before, divide both sides by domestic nominal GDP ($P_t Y_t$):

$$(E) \quad d_t = \frac{(1+i_t^d)}{(1+\pi_t^d)(1+g_t)} \alpha_{t-1}^{dc} d_{t-1} + \frac{(1+i_t^f)}{(1+\pi_t^f)(1+g_t)} \frac{e_t}{e_{t-1}} \alpha_{t-1}^{fc} d_{t-1} - pb_t + sfa_t$$

Now define the real exchange rate: $q_t = \frac{e_t P_t}{P_t^f} \Rightarrow \frac{q_t}{q_{t-1}} = \frac{e_t}{e_{t-1}} \frac{1+\pi_t^d}{1+\pi_t^f}$, and substitute into (E):

$$d_t = \frac{(1+i_t^d)}{(1+\pi_t^d)(1+g_t)} \alpha_{t-1}^{dc} d_{t-1} + \frac{(1+i_t^f)}{(1+\pi_t^f)(1+g_t)} \frac{q_t}{q_{t-1}} \alpha_{t-1}^{fc} d_{t-1} - pb_t + sfa_t$$

Then defining the foreign $(r_t^{f,P})$ and domestic $(r_t^{d,P})$ ex-post real interest rates as:

$$1+r_t^{j,P} = \frac{1+i_t^j}{1+\pi_t^j}$$

and substituting in:

$$d_t = \left(\frac{(1+r_t^{d,P})}{(1+g_t)} \alpha_{t-1}^{dc} + \frac{(1+r_t^{f,P})}{(1+g_t)} \frac{q_t}{q_{t-1}} \alpha_{t-1}^{fc} \right) d_{t-1} - pb_t + sfa_t$$

Subtracting d_{t-1} from both sides:

$$\begin{aligned}\Delta d_t &= \left(\frac{r_t^{d,P} - g_t}{(1+g_t)} \alpha_{t-1}^{dc} + \left(\frac{(1+r_t^{f,P})q_t - (1+g_t)q_{t-1}}{(1+g_t)q_{t-1}} \right) \alpha_{t-1}^{fc} \right) d_{t-1} - pb_t + sfa_t \\ \Rightarrow \Delta d_t &= \left(\frac{r_t^{d,P} - g_t}{(1+g_t)} \alpha_{t-1}^{dc} + \frac{q_t + q_{t-1}r_t^{f,P} + \Delta q_t r_t^{f,P} - q_{t-1} - q_{t-1}g_t}{(1+g_t)q_{t-1}} \alpha_{t-1}^{fc} \right) d_{t-1} - pb_t + sfa_t\end{aligned}$$

Which after further simplification yields the full debt-dynamics equation with foreign-currency debt (F):

$$(F) \quad \Delta d_t = \frac{1}{1+g_t} \left(r_t^{d,P} \alpha_{t-1}^{dc} + \left(r_t^{f,P} + \frac{\Delta q_t}{q_{t-1}} (1+r_t^{f,P}) \right) \alpha_{t-1}^{fc} - g_t \right) d_{t-1} - pb_t + sfa_t$$

If we again substitute for foreign and domestic real interest rates, and drop the cross term $\left(\frac{\Delta q_t}{q_{t-1}} \frac{r_t^{f,P}}{1+g_t} \right) \alpha_{t-1}^{fc} d_{t-1}$, which is typically small, from the RHS, we get equation (2):

$$(2) \quad \Delta d_t = \frac{1}{1+g_t} \left(\frac{i_t^d - \pi_t^d}{1+\pi_t^d} \alpha_{t-1}^{dc} + \left(\frac{i_t^f - \pi_t^f}{1+\pi_t^f} + \frac{\Delta q_t}{q_{t-1}} \right) \alpha_{t-1}^{fc} - g_t \right) d_{t-1} - pb_t + sfa_t$$

Debt dynamics with financial repression

To show the impact of financial repression and unexpected inflation, we first define expected inflation (π_t^e), and two additional (domestic) real interest rates: the ex-ante real interest rate (r_t^A), and the ex-ante free market real interest rate (r_t^F):

$$\begin{aligned}1+r_t^A &= \frac{1+i_t}{1+\pi_t^e} \\ 1+r_t^F &= \frac{1+i_t^F}{1+\pi_t^e}\end{aligned}$$

Adding and subtracting $\frac{1+i_t + (i_t^F - i_t)}{1+\pi_t^e}$ from the equation for the ex-post real interest rate:

$$1+r_t^P = \frac{1+i_t}{1+\pi_t} + \frac{1+i_t^F + i_t - i_t}{1+\pi_t^e} - \frac{1+i_t + (i_t^F - i_t)}{1+\pi_t^e}$$

Which can be rearranged as follows:

$$\begin{aligned}\Rightarrow 1+r_t^P &= \frac{1+i_t^F}{1+\pi_t^e} + \left(\frac{1+i_t}{1+\pi_t} - \frac{1+i_t}{1+\pi_t^e} \right) - \frac{i_t^F - i_t}{1+\pi_t^e} \\ \Rightarrow 1+r_t^P &= 1+r_t^F + (1+i_t) \left(\frac{1+\pi_t^e - 1 - \pi_t}{(1+\pi_t)(1+\pi_t^e)} \right) - \frac{i_t^F - i_t}{1+\pi_t^e} \\ \Rightarrow (G) r_t^P &= r_t^F - (1+r_t^A) \left(\frac{\pi_t - \pi_t^e}{1+\pi_t} \right) - \frac{i_t^F - i_t}{1+\pi_t^e}\end{aligned}$$

Substituting (G) into equation (C), the real debt-dynamics equation, leads to equation (3):

$$(3) \quad \Delta d_t = \frac{1}{1+g_t} (r_t^F - g_t) d_{t-1} - \frac{1}{1+g_t} (1+r_t^A) \frac{\pi_t - \pi_t^e}{1+\pi_t} d_{t-1} - \frac{1}{1+g_t} \frac{i_t^F - i_t}{1+\pi_t^e} d_{t-1} - pb_t + sfa_t$$

Appendix B: Inflation and debt reduction simulation details

Simulation	Details
Baseline	See Krause and Moyen (2016).
More flexible prices	Theta changed from 0.75 to 0.25 (so prices change on average three times per year instead of once).
15 year debt maturity	Alpha falls from 0.0472 (consistent with average debt maturity of just over 5 years) to 0.0167.
1 year debt maturity	Alpha rises to 0.25.
Slow learning	Investor inflation expectations are formed by least squares learning.
Rapid inflation	Inflation persistence parameter, rho, falls from 0.99 to 0.95.
Rapid inflation and slow learning	Expectations are formed by least squares learning and rho falls from 0.99 to 0.95.

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Sovereign Default

Julianne Ams, Reza Baqir, Anna Gelpern, and Christoph Trebesch

This chapter examines sovereign default. We begin with the challenge of defining default, highlighting the limitations of existing definitions and proposing an alternative. Section 2 considers the sovereign's decision to default, first, by creditor type, second, by the manner of default (debtor action). We illustrate these with case studies of crises in Jamaica, Ukraine, Uruguay, and Russia. Section 3 reviews the economic determinants of default, including domestic and external shocks, and considers the legal determinants, which merit further systematic study. Section 4 surveys the economic, financial, and legal consequences of default. Section 5 concludes with ideas for reducing the incidence and the cost of default. Throughout this chapter, we start from the assumption that default is never the first-best option for the sovereign or its creditors. Nonetheless, we also recognize that default—in the sense of not paying debt in full and on time—is sometimes unavoidable and may be the best choice available to the sovereign debtor under some circumstances. Defaults should not be avoided at all cost, but debtors and creditors alike can help reduce its incidence and cost, consistent with development, growth, and financial stability objectives.

1. Defining Default: Legal and Economic Perspectives

A. The definition challenge: An overview and proposed solution

It is surprisingly hard to define sovereign default. Academic and policy analyses often conflate default—an *event*—with *conditions* that precipitate the event

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(insolvency, illiquidity, unwillingness to pay), with debtor conduct in the debt restructuring *process* (voluntary, coercive), or with restructuring *outcomes* (haircut, maturity extension) and *consequences* (market exclusion).

Default at its simplest is a broken promise. For sovereign debt, it could include a missed payment, involuntary subordination, or data misreporting. In many cases, debt contracts specify violations that trigger particular creditor remedies. The list of violations and remedies is usually found under the heading “Events of Default” (EoD) in English- and New York-law debt contracts and their analogues in official bilateral and multilateral credit agreements. Contractual EoD are designed to be observable and enforceable, whether by giving creditors the right to suspend disbursements and demand immediate repayment in full, or by authorizing judicial remedies.¹

Formal contractual definitions are both too broad and too narrow to be useful. They are too broad because they include minor infractions, such as a brief delay in transmitting paperwork, which creditors would normally consider unimportant. The definitions are too narrow because they exclude economically significant events such as the Greek debt exchange in March of 2012, in which no payments were missed and no promises were formally broken—contracts were modified instead—but creditors still faced deep losses. The rise in domestic-law debt complicates the analysis further, because such debt often lacks *any* contractual definitions of default, because background law differs across countries, and because sovereigns can change their own laws to undo or excuse default.

We therefore go beyond debt contracts, to review definitions of default used in seminal economic research (Section 1.B) and by market participants, such as credit rating agencies and derivatives traders (Sections 1.F and 1.G). Third-party actions such as ratings downgrades or credit default swap (CDS) triggers can have major economic consequences for the sovereign and its national economy, on par with the consequences of breach. Third-party definitions of default key off discrete, observable events, but tend to focus on economic substance over legal form. We do not cover potentially influential third-party responses to sovereign distress, such as index exclusion, collateral eligibility, or regulatory treatment, which may merit further consideration.

In practice, neither formal contractual nor substantive economic definitions are fully satisfactory. To address some of their shortcomings, we propose an

¹ In contrast, because official creditors do not normally sue sovereign debtors in national courts, the parties might reasonably expect disputes to be resolved through diplomatic or administrative channels.

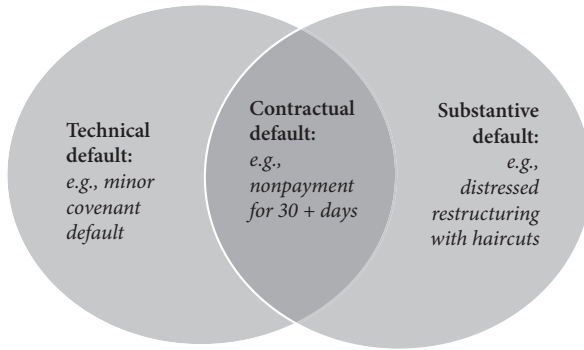


Figure 7.1 Defining default

analytical approach that would distinguish among *technical default*, *contractual default*, and *substantive default*, as follows (also depicted in Figure 7.1):

Technical default includes any contractual EoD or equivalent for domestic and official debt that does *not* also constitute default under specified influential third-party definitions. Administrative errors and some covenant defaults viewed as minor by market participants would fit under this heading.

Contractual default includes the occurrence of any EoD or its functional equivalent that *also* constitutes default under the same third-party definitions. For instance, virtually all contractual and third-party definitions of default include failure to repay principal or pay interest after a grace period (typically 30 days); these would fall under contractual default.

Substantive default includes events that would count as default in third-party documentation and practice, but not in the underlying contract. Thus, a distressed debt exchange, or a restructuring using local law or Collective Action Clauses (CACs), would be substantive default if it complied with the contract and resulted in less favorable terms for the creditor.

We find this approach appealing for its relative simplicity, for its ability to account simultaneously for internal contractual and outside market views of what matters in default, and for disaggregating the consequences of default. The remainder of Section 1 will examine more closely the content, rationale, and operation of theoretical, contractual, and third-party definitions of default, and their implications for research and practice. We further elaborate the prevailing explanations of why sovereigns default and review the relevant literature in Section 2.

B. How economic research defines default

Economic theory literature does not go to great lengths to define the concept of default. Typically, the definition is implicit and includes missed payments of any sort. For example, in Eaton and Gersovitz (1981) a country that misses a single payment will no longer be able to borrow from international capital markets for reputation reasons. As a result, it is optimal for the government to default in full. The definition of default as complete payment cessation lives on in many modern quantitative models building on the Eaton–Gersovitz framework (e.g., Aguiar and Gopinath 2006; Arellano 2008). In this world, default is an all-or-nothing affair.

Bulow and Rogoff (1989a) take a more nuanced approach and allow for partial default and debt renegotiation, with legal considerations playing an important role. If a sovereign misses a payment it breaches its contract with lenders (banks) who can retaliate by seizing part of the country's exports. Moreover, rather than defaulting in full, debtors can negotiate debt restructuring agreements with partial losses. Many recent models follow this approach and also allow for the possibility of debt renegotiations with partial default (e.g. Benjamin and Wright 2009; Yue 2010; or Asonuma and Trebesch 2016). Another strand of the theory literature builds on Grossman and van Huyck (1988), where lenders distinguish between excusable defaults, which occur as a result of exogenous shocks, and unjustifiable repudiation (inexcusable default). While theoretically appealing, inexcusable or strategic defaults are difficult to identify in practice.

In the empirical literature, many economists use rating agencies' definition of default (see Section 1.F below). The most widely used datasets adopt this approach. Reinhart and Rogoff (2009), in particular, trace missed payments as well as distressed debt restructurings to construct a binary indicator of sovereign default. More recently, researchers have refined this approach by calibrating the scope of default events, such as missed payments (arrears), and the size of creditor losses (haircuts) in distressed restructurings in modern and historical debt crises (Sturzenegger and Zettelmeyer 2007; Cruces and Trebesch 2013; Schlegl et al. 2017; Beers and Mavalwalla 2018; Meyer et al. 2019). This is closer in spirit to Bulow and Rogoff (1989a) and moves away from the simplistic zero-one default definition.

Research on the cost of default (Section 4 below) has used many different default definitions in an effort to identify which elements of debt distress and distress management—such as economic conditions, debtor conduct, or restructuring outcomes—have significant economic consequences. However,

using a single term “default” for a variety of events, conditions, and behaviors invites apples-and-oranges comparisons by casual or opportunistic consumers of the studies.

C. Contractual events of default: market instruments

The following categories of contractual EoD are typical in the sovereign debt markets in London and New York:

Payment default is failure to pay principal, interest, or other amounts (such as tax gross-up) when due, after the expiration of any applicable grace period. Interest payments typically enjoy grace periods ranging from ten to thirty days. Grace periods are slightly less common, and may be shorter, for principal payments (e.g., Gooch and Klein 1994; Buchheit 2006 for loans; see Annex 7.1 for examples from tradable securities).

Payment, settlement, and securities custody mechanics can make it hard to ascertain the precise timing of payment default. Debtors and creditors typically deal with each other through layers of agents. Contracts typically say that payment is made when the debtor has transferred funds to the paying agent, trustee, or clearing system. However, some contracts do not consider a payment to be made until each creditor has received the funds, as in Argentina’s 2005 and 2010 exchange bonds. This distinction became salient when a US federal court blocked Bank of New York Mellon as trustee for Argentina’s exchange bonds from distributing the government’s interest payment to the bondholders.

Repudiation happens when the sovereign rejects its obligation to pay, which could happen before or after any payment is due. Governments typically avoid questioning the validity of their debts, or announcing their intention not to pay before missing a payment, since in practice, repudiation carries all the traumatic consequences of payment default discussed in Section 4. Repudiation may go hand in hand with governments questioning the legitimacy of one or more obligations. The literature on “Odious Debt” includes a handful of examples (Lienau 2014; King 2016). In 2008, Ecuador claimed that two bonds issued by a previous government were illegitimate and pledged not to pay them. It launched a buyback offer the following year in the shadow of the illegitimacy claim, and ultimately secured nearly two-thirds debt relief with more than 90 percent of the creditors participating.

Moratorium is a unilateral payment stop on one or more debt obligations. The sovereign might announce a moratorium—as Mexico did in 1982

(Kraft 1984)—as an interim measure before launching a debt restructuring; it might also stop payments indefinitely. A moratorium entails a public act, such as an announcement or legislation, apart from the missed payment, which can come before or after the payment default. However, it need not contest the validity of the underlying obligation. A moratorium is distinct from a negotiated payment suspension: if the creditors agree to a stop, they can waive the payment default.

Policy-related EoD may include loss of IMF membership or ineligibility to draw on IMF resources. Such EoD have the practical consequence of incorporating elements of the IMF Articles of Agreement and policies, and amplify the effect of its sanctions (e.g., Choi et al. 2012). Other policy-related EoD, such as maximum debt ratios, are widespread in corporate debt but unusual among sovereigns. Notable exceptions include Ukraine's borrowing from Russia in 2014, which included a number of bespoke EoD designed to maximize creditor control and make it easy to trigger acceleration. Because policy conditions are often at the heart of official lending, some forms of multilateral policy conditionality are indirectly incorporated in contractual EoD by reference to membership and sanctions.

Covenant default is a residual category that captures a breach of all other express promises under the debt agreement (Annex 7.1), ranging from clerical omissions to material violations. The latter category might include effective subordination of creditors without their consent, in violation of the *pari passu* or negative pledge clauses. Covenant defaults also include false representations, which could range from data misreporting to lack of borrowing authority at the time the contract was made. Subsequent loss of borrowing authority is usually a separate EoD.

Cross-default terms link two otherwise-unrelated debt contracts, so that default under one becomes default under the other (Annex 7.1). The theory behind cross-default is a mix of early warning and inter-creditor equity. All else being equal, missing payments to other creditors points to debt distress. Without cross-default, a creditor may have no recourse as others sue and divide up the debtor's scarce assets among themselves.

Cross-default clauses vary in two important ways: trigger and scope. With hair-trigger cross-default, creditors may exercise their default remedies in response to a minor infraction under someone else's contract. At the other extreme, they might have to wait until creditors under the other contract have demanded immediate repayment in full. Some versions of the clause excerpted in Annex 1 include minimum thresholds for missed payments on other debts. The scope of cross-default can range from a narrow sliver of

similar debt (e.g., foreign-law bonds cross-defaulting to foreign-law bonds) to all sovereign and quasi-sovereign obligations, which is rare.

Four additional observations should help situate contractual EoD in the sovereign default context:

First, EoD only give creditors the right to invoke contractual remedies; creditors are under no obligation to do so. In prominent cases of selective default (see Section 2.B), including most recently Venezuela, bond holders chose not to exercise their rights long after the governments defaulted on other debt, preferring instead to get paid as long as possible. If creditors do not act, the debtor may have an opportunity to “cure” the default.

Second, a debt restructuring may not constitute a contractual EoD, regardless of creditor losses. As noted earlier, a market-based debt exchange, a voluntary renegotiation, or a majority vote to change debt terms using CACs would either follow the contract or circumvent it. Neither would breach it.

Third, EoD in sovereign bond contracts are often subject to collective action requirements. For instance, even if the government fails to make a scheduled interest payment and the grace period expires, bond holders may have to muster a vote of at least 25 percent of the principal to instruct the Trustee to “accelerate.” If the debtor later makes up the payment, holders of at least 50 percent of the principal could instruct the Trustee to reverse the acceleration (Buchheit and Gulati 2002).

Fourth, minor differences in EoD wording and procedural requirements, such as notices, can lead to different consequences for the same events.

D. Contractual defaults on official debt—suspension, refund, acceleration

Official bilateral and multilateral credits include terms similar to private contractual EoD, but are structured differently in important ways, reflecting the creditors’ mandates and, for multilateral creditors, their character as membership organizations. We use the General Conditions of IBRD and IDA (together, World Bank) loans to illustrate (World Bank Group 2017). The General Conditions make a useful point of comparison to private contractual EoD because the World Bank is the largest multilateral creditor, it has a global policy mandate, it lends only to sovereigns, and because today’s General Conditions have been revised many times to reflect the World Bank’s experience in lending.

The General Conditions are incorporated by reference in transaction-specific “legal agreements” between the World Bank and its borrowing member; unlike the legal agreements, General Conditions do not vary by borrower or by transaction. Article VII of General Conditions contains three potential analogues to contractual EoD: (i) events that would allow the World Bank to suspend or cancel disbursements; (ii) events that would require a refund from the sovereign; and (iii) events that could trigger acceleration (immediate repayment). The last category, “Events of Acceleration,” comes closest to EoD in private contracts, and can trigger cross-default under private contracts.

Suspension and cancellation

The World Bank may suspend disbursements or cancel the loan in response to any of the following: “payment failure,” “performance failure” (referencing transaction-specific terms), fraud, corruption, misrepresentation, unauthorized assignment of obligations, ineligibility to draw, withdrawal from membership in the World Bank or the IMF, “cross-suspension” of other World Bank loans, or any of a series of events that convince the lender that the program is unlikely to be carried out. Suspension and cancellation events are distinct from default under market instruments. The focus is on the policy objectives and the use of proceeds consistent with the lender’s mandate. Ideally, the prospect of suspension of all World Bank disbursements across the board should bring the authorities to the negotiating table and fix the underlying problem. However, it is not meant to bring about the collapse of the sovereign’s debt structure through cross-default.

Refund

The World Bank can require sovereigns to refund past disbursements if it determines that they were used in a manner inconsistent with its loan agreement, typically due to fraud or corruption. The 2017 revision made clear that the refund requirement was not intended, and was not perceived in the market, as a cross-default trigger for bonds and loans.

Acceleration

The World Bank can demand immediate repayment of a disbursed loan in the event of a payment default on any of its exposure to the sovereign, subject to a grace period. Unauthorized assignment, material adverse change, failure of co-financing, and events specified in transaction-specific agreements may trigger acceleration under some circumstances. Of all the sanction triggers

specified in Article VII of General Conditions, the term “default” is only used in the third category, “Events of Acceleration,” which is understood to interact with cross-default terms in loan and bond contracts.

E. Domestic debt—no definition, no default?

Debt governed by the sovereign issuer’s domestic law typically has few express terms. For example, it is not customary for domestic-law debt to include a litany of EoD. As a result, it can be difficult to identify a clear contractual definition of default on domestic debt. The relevant contractual terms may be incorporated by reference to statutes and administrative regulations, which vary in form and substance among different countries (Addo Awadzi 2015). For instance, the Uniform Offering Circular is a US federal regulation that sets out terms and conditions for most tradable US Treasury securities. Of its thirty-four sections, thirty spell out auction procedures; one tells when the creditors are paid, and none address substantive modification or default (31 C.F.R. 356 and 356.30).

This does not mean that governments cannot default on domestic debt. Instead, default and remedies for default are a matter of background law—contract, constitutional, and administrative, among others. For instance, in most jurisdictions, a debtor that simply fails to pay as promised would be in default. However, as Austin (2016) illustrates with examples of payment disruptions on US Treasury securities in 1814, 1933, and 1979, missing domestic debt payments sometimes has no discernible domestic or international consequences for the sovereign. He suggests that of the three incidents, the failure to pay in 1814 on account of a “bankrupt” Treasury comes closest to the widely shared contemporary understanding of default. There is no agreement in the literature or jurisprudence on the default status of the other two episodes, which involved retroactive removal of indexation and administrative delays, respectively.

The power to change domestic law—so that default is either excused, or no longer counts as default—is inherent in sovereignty, subject only to constitutional constraints as interpreted and enforced by domestic courts. In some legal systems, governments have express additional flexibility under domestic law to respond to economic emergencies (e.g., Gross and Ni Aiolan 2006).²

² For a recent illustration, see e.g., *Mamatas and Others v. Greece*, ECHR 256 (2016), 21.07.2016.

In sum, even something as simple as payment default on domestic debt requires context for a meaningful definition. It is not clear that an event with no discernible legal or economic consequences should be called a default.

Although domestic-law sovereign debt may be less vulnerable to formal default, it is more vulnerable to unilateral modification by the debtor designed to lower its payment burden and reduce payoff for the creditors (e.g., Moody's 2011; Cruces and Trebesch 2013; S&P 2017; Beers and Mavalwalla 2018; Fitch 2018). If debt is denominated in local currency, sovereigns can use monetary policy to reduce its value (Chapter 6). They can also use fiscal policy, such as withholding taxes, to recapture at least in part payments that would otherwise go to creditors.³ Reinhart and Sbrancia (2015) group these policies under the rubric of modern-day "financial repression."

F. Rating agency criteria for default

Rating agency definitions of default matter because they inform ratings actions. A sovereign downgrade may lead to rapid sell-off of the borrower's debt, since some investors would be barred from holding it by regulation, contract, or mandate (Böninghausen and Zabel 2015). It may also trigger downgrades of other borrowers in the country, particularly financial institutions that benefit from sovereign guarantees, becoming a source of contagion.

As information intermediaries, credit rating agencies have developed distinct methodologies for evaluating sovereign default, which inform their analysis and ratings. Their criteria focus overwhelmingly on payoff. They reference underlying credit agreements but are both far more streamlined and broader than EoD. For example, Moody's definition of default includes three kinds of events:

- (i) failure to pay interest or principal within the grace period under the debt agreement;
- (ii) a distressed debt exchange that reduces the sovereign's financial obligation to avoid payment default; and
- (iii) unilateral change in payment terms "imposed by the sovereign that results in a diminished financial obligation, such as a forced currency

³ For example, in 1999, the government of Turkey imposed a retroactive withholding tax of between 4 and 19 percent on interest income from domestic currency bonds. Note, however, that many bond contracts include explicit language fixing bondholders' tax liability; imposition of a tax in such a case could be a contractual EoD.

re-denomination...or a forced change in some other aspect of the original promise, such as indexation or maturity.”⁴ (Moody’s 2019)

This definition relies on the underlying agreements for payment default parameters and includes two additional elements beyond payment default: a debt restructuring, even if it is preemptive and consensual (discussed in Chapter 8), and domestic law measures that target and adversely affect payoff, whether or not they amount to default under the terms of domestic debt instruments.

G. Credit default swaps—credit events and default

Sovereign CDS are tradable contracts under which “protection sellers” take on sovereign credit risk for a fee from “protection buyers.” The buyers enter into CDS contracts either to hedge existing exposure to the sovereign, or to bet against the sovereign credit. If the sovereign defaults—in CDS parlance, if a “credit event” occurs—the seller must compensate the buyer for the loss in value of a “reference obligation” specified in the CDS contract. Sovereign CDS have grown as a share of the CDS market (primarily attributable to contracts referencing European sovereign credits), reaching 16 percent at the end of 2017. However, the aggregate notional amount of all sovereign CDS outstanding, approximately \$1.5 trillion, is still small relative to the \$40 trillion bond market (Aldasoro and Ehlers 2018).

CDS definitions of sovereign credit events matter because CDS contracts transmit credit risk and can become a source of financial market contagion in a sovereign debt crisis. CDS contracts are highly standardized and, to enhance CDS liquidity, definitions do not normally vary across parties or transactions. They are drafted by a trade group, the International Swaps and Derivatives Association (ISDA), which takes copyright in its standard terms. The term “Credit Event” is included in the ISDA’s Definitions Booklet (ISDA 2003, 2014) and incorporated by reference in particular transactions. CDS could trigger independently of any definition of default in a sovereign debt contract. As a result, ISDA definitions can have a homogenizing effect in a world of incompletely standardized debt contracts.

The definition of sovereign credit events that trigger protection sellers’ payment obligations reflect the objectives of the CDS instrument: to isolate and

⁴ A fourth event of default, bankruptcy, or receivership, does not apply to sovereigns.

transfer credit risk, as distinct from “legal” risks, economic conditions, or policy performance. In addition, CDS are meant to be actively traded, which implies that credit event attributes should be observable and verifiable.

Among credit events, the definition of restructuring is the most challenging and controversial of the lot, since it captures a wide range of consensual and involuntary outcomes (e.g., Gelpern and Gulati 2012). It includes principal and interest reductions, payment date extensions, subordination, and redenomination into currencies other than those of the G-7 or top-rated OECD member countries, *provided* any such change is related to deteriorating creditworthiness or financial condition of the sovereign and is effected in a way that “binds all holders” of the reference obligation. Protection sellers and buyers can select which of the credit events would apply to their transaction.

2. Varieties of Default: Who is Affected? How is It Done?

While it is never the first-best solution, default can be a critical step on the sovereign’s path to debt relief and debt sustainability. The threat of default is among the most powerful tools in the sovereign debtor’s restructuring repertoire (see Chapter 8). As noted in Section 1.B, an influential early strand of economic literature has treated debt default as binary—the country is either in default or not (e.g., Eaton and Gersovitz 1981; Arellano 2008). More recent work has begun to delve more deeply into the different ways a sovereign can default. In order to explore the different considerations a debtor must weigh, we examine this decision from two angles: default by creditor type (i.e., on whom to default) and default by debtor action (i.e., how to default).

A. Default by creditor type

Given that a default on different creditor groups will result in different consequences for a debtor, a debtor may choose to discriminate, often by using different categories of debt as a proxy. One key underlying concern in differentiating among creditors is that selective default may give rise to inter-creditor equity concerns and complicate the restructuring task down the road if the debtor’s actions are widely perceived as unfair. Whenever a debtor chooses to differentiate, therefore, it becomes important to justify that choice on relevant grounds.

Default on official and private creditors

Among multilateral, bilateral, and private creditors, multilateral creditors are least likely to face sovereign default (Schlegl et al. 2017), and even less likely to participate in a restructuring.⁵ It has been generally accepted by official and private creditors that IMF financing, in particular, should be excluded from sovereign debt restructurings, as the IMF's lending during crisis situations (just when all other creditors are exiting) constitutes a public good that helps resolve a country's balance-of-payments problems (Rieffel 2003; IMF 2009; Lastra 2014; Steinkamp and Westermann 2014).⁶ Other multilaterals are also generally considered senior creditors (*cf.* Roubini and Setser 2004), though that status has occasionally been called into question (Bulow and Rogoff 1988, Gelpern 2004). Bulow and Rogoff (1988) observe that the data from the 1980s do "not square with the official view that obligations to the IMF and the World Bank are senior claims."

By contrast, official bilateral creditors restructure frequently—pre- or post-default, formally and informally—either through the provision of new financing or the restructuring of existing debt. Indeed, because of the long-standing track record of official creditors giving concessional treatment to distressed sovereign debtors (see Chapter 8), credit rating agencies generally do not consider a failure to pay debt owed to another government a default (e.g., S&P Global Ratings 2017; Fitch 2018).

Conventional wisdom has been that, despite the lack of *de jure* seniority rankings among creditors, private creditors generally face a higher risk of default and steeper haircuts than official bilateral creditors (e.g., Roubini and Setser 2004).⁷ In line with this, Steinkamp and Westermann (2014) note that 65 percent of experts responding to the 2013 World Economic Survey indicated that they expected bilateral loans extended during the Eurozone crisis to be treated as senior debt. However, recent research challenges whether this

⁵ For example, Reinhart and Trebesch (2015) show twenty-three instances of members running arrears to the IMF over the institution's 70-year history.

At the start of the twenty-first century, international pressure prompted some of the largest multilateral creditors, including the World Bank and the IMF, to provide conditional debt relief to a group of low-income countries through the Heavily Indebted Poor Countries Initiative and the Multilateral Debt Relief Initiative, with assurances from the G-8 countries that such debt relief would jeopardize neither the multilaterals' ability to continue to provide financial support nor the multilaterals' own finances.

⁶ The *de facto* nature of the IMF's "preferred creditor status" means that when a country receives financing from the IMF, there is no legal subordination of existing debt, and no credit event has occurred. For an example, see the International Swaps and Derivative Association's determination regarding Ireland's IMF financing in 2011.

⁷ Trade creditors are often seen as outside this calculus because interruption of payments would have immediate implications for trade (Kaletsky 1985). More recent work, however, has found that trade creditors face default more often than previously supposed (Schlegl et al. 2017).

perceived seniority holds true in practice. Schlegl et al. (2017) and Moody's (2018) both find that Paris Club restructurings outnumber defaults on private creditors and often result in larger haircuts on the official creditors.⁸ Moreover, when focusing on the start of default, Schlegl et al. (2017) find that sovereigns are more likely to accumulate arrears towards official creditors than towards private creditors. The speed and scope at which payments are missed suggests that government-to-government loans are junior to private bank loans and bonds, even after controlling for country characteristics and the size and composition of the debt outstanding.

Default on foreign and domestic creditors

A debtor may also seek to differentiate between foreign and domestic creditors and favor one or the other depending on their domestic concerns and their objectives in the ultimate restructuring (Sturzenegger and Zettelmeyer 2005). Erce and Díaz-Cassou (2010) have found that considerations that lead to this type of discrimination include the origin of liquidity pressures, the soundness of the banking system, and the domestic private sector's reliance on international markets. Others have identified domestic politics as a key factor (Kohlscheen 2010; Erce 2013). The economic consequences of default will be described in more detail below. In short, a default on resident creditors can impact the health of the financial system and will merely reallocate adjustment internally, whereas a default on non-resident creditors can impair private-sector access to capital markets but also will redistribute the burden partially outside the issuer's economy (Erce and Díaz-Cassou 2010; Erce 2013).

Domestic creditors can be subject to certain incentives to participate in an exchange. While a distressed exchange can occur with both domestic and foreign debt, domestic creditors may be particularly vulnerable to the issuer's regulatory power over financial institutions and moral suasion (e.g., appeals to patriotism to increase exposure to government debt).⁹ For example, in the 2003 Uruguay restructuring, the central bank declared the old bonds ineligible for liquidity assistance, effectively rendering them unmarketable. Failure of a bank to participate in the exchange would have therefore hurt their provisioning and capital adequacy ratios (IMF 2014). Where the stability of the financial sector was a concern, some restructurings have included a framework for central bank liquidity provision—Case Study 7.1 discusses the case

⁸ As highlighted by Roubini and Setser (2004), the differences between Paris Club treatments and private creditor restructurings—e.g., flow treatments by the Paris Club over a limited period compared with “stock” restructurings of privately held debt—makes an apples-to-apples comparison difficult.

⁹ Erce and Díaz-Cassou (2010) provide examples from Uruguay's and Argentina's exchanges.

of Jamaica, and Case Study 7.2 presents Uruguay. Russia provides an example of a sovereign default that had devastating effects on the domestic banks (Case Study 7.2).

In practice, cleanly separating foreign and domestic creditors is very difficult. The type of debt can be used as a proxy to some extent, categorizing along different axes, including governing law and currency (Chapter 2). However, as many observers have noted, the move toward liberalizing capital flows in recent years means that foreign creditors are increasingly holding domestic-law, domestic-currency instruments, and vice versa, making this distinction—and the resulting economic predictions—ever more difficult (Gelpern and Setser 2004; IMF 2015; Moody's 2016).

Jamaica's restructuring in 2013 and Ukraine's restructuring in 2015 provide an interesting contrast between debtors that chose to focus on debt held by domestic creditors and foreign creditors, respectively (See Case Study 7.1).

Case Study 7.1 Restructuring domestic vs. external debt

Jamaica (2010, 2013)

In the decade leading up to the 2010 debt exchange, Jamaica faced annual debt service costs of 112 percent of government revenue, with interest on some local currency bonds reaching 28 percent. By 2009, annual interest payments constituted over 60 percent of fiscal revenue.

In January 2010, with a debt-to-GDP ratio of 124 percent, the government launched a pre-default debt exchange chiefly aimed at reducing the fiscal burden of domestic debt service; external debt was explicitly excluded. The 2010 debt exchange (also known as the Jamaica Debt Exchange, or JDX) covered over 350 domestic debt instruments (local currency, USD-indexed, and USD-denominated)—constituting USD 7.86 billion, or 63.7 percent of GDP. Following informal creditor consultations, the exchange involved a reduction of coupons and an extension of maturities with an NPV haircut of approximately 20 percent. The exchange, which was intentionally designed to be light so as to avoid domestic disruption, was completed just one month later in February 2010 with over 99 percent participation and resulted in fiscal savings of 3.5 percent of GDP, an average extension of maturities for domestic debt from 4.7 years to 8.3 years, and an average coupon decline of 650 bps to 12.5 percent. There was no official-sector restructuring.

Continued

Case Study 7.1 *Continued*

Jamaica's credit rating was initially downgraded to Selected Default until the IMF approved a stand-by arrangement for Jamaica. Jamaica reentered the domestic capital market in April 2010 at lower rates than before the JDX, and it raised funds in the international capital market in February 2011 on an oversubscribed bond issuance.

In the end, however, the exchange provided only a temporary reprieve. The following years saw slow growth, continued high government spending, and weak tax compliance. By the end of 2012, the debt-to-GDP ratio stood at about 150 percent. In February 2013, the government announced another preemptive restructuring of domestic debt (this time known as the National Debt Exchange, or NDX). The restructuring, which again reduced coupons and extended maturities, included twenty-eight domestically-held local-currency and USD-denominated bonds amounting to approximately USD 9.1 billion, or 64 percent of GDP. With participation of nearly 100 percent, the restructuring was designed to achieve fiscal savings of 8.5 percent of GDP and involved an NPV haircut of about 10 percent with maturities extended by three to ten years, and coupons lowered between 75 and 500 bps. Rating agencies downgraded Jamaica's credit rating to Selected Default, raising it after the exchange, but not to pre-NDX levels (CCC vs. B–).

Because 65 percent of government debt was held by domestic financial institutions at the time of both restructurings, the government proceeded with caution to avoid threats to domestic financial stability. The government performed stress tests to identify vulnerabilities in the financial system and tailored the exchange accordingly. Jamaica explicitly excluded foreign-law bonds from the restructurings for several reasons. First, domestic debt presented the largest ongoing payment concern. Second, the government wished to quickly reestablish access to international markets. Third, the government lacked sufficient information about foreign bondholders to help secure adequate participation.

Sources: IMF (2014, 2015a, at Annex II, Appendix); Grigorian et al. (2012); Erce (2013); IMF (2013); IMF (2018, Annex II).

Ukraine (2015)

Heightened tensions with Russia following the annexation of Crimea exacerbated ballooning financing needs, and it became clear by end-2014 that Ukraine's debt burden was unsustainable. A preemptive debt exchange operation was announced in January 2015 and launched in September 2015,

with three objectives, tied to the parameters of an IMF-supported program: (i) generating US\$15 billion in public sector financing over the next three years; (ii) lowering debt-to-GDP ratio from almost 80 percent to under 71 percent by 2020; and (iii) limiting gross financing needs to an average of 12 percent of GDP in 2015–18 and 10 percent of GDP in 2019–25.

The debt exchange covered four categories of debt—US\$18 billion of government-issued Eurobonds held by external creditors including Russia, US\$0.5 million of government-guaranteed external commercial loans of SOEs, US\$0.6 million of City of Kyiv Eurobonds, and US\$3.3 billion of non-sovereign-guaranteed external debt of three SOEs. Following extensive discussions with a creditor committee representing large bondholders, the restructuring called for a 20 percent haircut on outstanding Eurobond amounts, a four-year extension of maturities, and a higher coupon (7.75 vs. 7.2). The exchange also included a GDP warrant to provide a potential upside to creditors in 2021–40. The terms for guaranteed SOE loans and City of Kyiv Eurobonds mirrored those for the Eurobonds but with a 25 percent haircut and shorter maturity extension. There was no haircut for non-guaranteed SOE debts, which were stretched out with a higher coupon. CACs were triggered on the two sets of Eurobonds and the non-guaranteed SOE debt, resulting in no holdouts save Russia's National Wealth Fund (see next paragraph). Participation in the other debt categories was lower.

While debt held by official creditors was generally not restructured, a US\$3 billion Eurobond held by Russia's National Wealth Fund was initially swept into the Eurobond restructuring by Ukraine. Russia refused to participate, and Ukraine defaulted on the bond in December 2015. Upon petition by Russia, the IMF declared the Russian-held Eurobond to constitute official bilateral debt under the IMF's arrears policies (see Chapter 8), prompting Ukraine to enter into bilateral discussions on restructuring. Russia filed suit in an English court to enforce payment. At the time of this publication, the debt had not been restructured.

Two-thirds of public debt was held by non-residents; domestic creditors, including those holding foreign-currency debt, were excluded. This perimeter was drawn partly due to financial stability concerns but primarily because increased recapitalization needs would incur a fiscal cost, leading to non-observance of the objectives laid out under the IMF-supported program.

Sources: IMF (2015b); Ministry of Finance of Ukraine (2015); IMF (2016a, Debt Sustainability Analysis Annex); IMF (2016b).

Case Study 7.2 Hard vs, soft restructuring

Uruguay (2003)

Uruguay's economy was severely impacted by the Brazilian and Argentine crises of the late 1990s and early 2000s, in part due to high dollarization. In May 2002, widespread withdrawals from the banking system, including by Argentine depositors, who held 40 percent of deposits in Uruguayan banks, led the Uruguayan authorities to declare a five-day bank holiday. Facing low foreign exchange reserves and crippling external debt-service payments, the government decided to float the currency. The peso depreciated by 27 percent overnight and ultimately by 50 percent. Public debt, which constituted 40 percent of GDP in 2001, reached approximately 100 percent in 2003.

Despite an investment-grade rating as late as 2002, in March 2003, the government announced a preemptive and voluntary debt exchange involving an extension of maturities. The exchange covered US\$5.4 billion in foreign-currency debt held by private creditors, including domestically-issued bonds and bills, a Samurai bond issued in Japan, and international bonds issued under foreign law. This was about half of total debt and was considered comprehensive. Domestic creditors were thought to hold just over half of debt and to mostly constitute retail investors. Official bilateral debt, which was not a major component of debt at the time, was not rescheduled. The exchange was launched in April and settled in May with a small NPV reduction. Maturities were extended by an average of 6.4 years for foreign-law bonds and 8.6 years for domestically-issued bonds.

The exchange achieved a high rate of participation—99 percent participation in the domestic exchange, and 93 percent overall—through a combination of techniques (see Chapter 8). Only the relatively small (US\$0.3 billion) Samurai bond included a CAC. For the other bonds, participating creditors could choose whether to vote for exit consents to remove the cross-default/cross-acceleration clause, to allow the bonds to be delisted in international exchanges, and to amend the waiver of sovereign immunity. For domestic bank bondholders, the central bank encouraged participation in the exchange by announcing that old bonds would no longer be eligible for liquidity assistance. Because the old bonds had to be marked to market and would require a 100 percent risk weight for capital ratios, it was an inevitability that banks would participate in the exchange. To minimize financial instability, the government, supported by multilateral institutions, established a bank recapitalization facility. This was designed to support the central bank's lender-of-last resort facilities, to provide financing for

bank recapitalization, to cover all US dollar deposits in public banks, and to provide liquidity support to the payment system. Ultimately, the FDBS helped restore confidence in the financial system.

Following the exchange, and supported by strong economic policies and an IMF arrangement, Uruguay reestablished debt sustainability and entered a period of economic recovery. The country regained market access quickly, issuing a dollar-denominated bond in June 2003. Uruguay's credit rating, which was downgraded to "Selective Default" for less than a month, recovered over the following year but did not reach investment grade until 2012.

Sources: Buchheit and Gulati (2000); IMF (2003a, 2003b); Buchheit and Pam (2004); Erce (2013); Cruces and Trebesch (2013); IMF (2014, Annexes II, III, IV).

Russia (1998)

Oil price shocks and the Asian Financial Crisis exacerbated domestic political tensions and financial market pressures in early 1998. By May, interest rates quintupled, and the central bank doubled its sales of foreign exchange to defend the ruble. The government's debt service on short-term government bonds (GKO) skyrocketed, but investor flight continued, and international reserves plummeted. In mid-July, supported by the IMF, the government announced a voluntary swap of US\$4.4 billion of GKOs for long-term Eurobonds. However, very low participation in the exchange, coupled with the political failure of key fiscal measures intended to support the exchange, triggered a rise in GKO yields to nearly 300 percent. The central bank faced pressures from multiple sides—providing credit to the government, supporting commercial banks, and draining reserves to support the ruble. Between July 10 and August 14, the central bank lost US\$4.5 billion in reserves.

In August 1998, the government suspended payments on US\$45 billion (at the pre-crisis exchange rate) in treasury bills (GKOs and medium-term ruble bonds known as OFZs) maturing before end-1999 and announced a 90-day standstill in servicing private external debts, short positions on currency forwards, and margin calls on repo operations. Because domestic debt represented the biggest liquidity constraint, the government was able to remain current on post-Soviet external debt obligations.¹ Also in August, the government widened the exchange rate band, suspended secondary market trading of GKOs and OFZs, and announced plans to introduce capital controls. Despite large-scale interventions, the central bank was unable to maintain the band, and the ruble was allowed to float in early

¹ The government defaulted on external Soviet-era debt.

Case Study 7.2 *Continued*

September. The float, coupled with the default on GKO and OFZs, led to the collapse of many domestic banks, which had invested heavily in government securities. The banking system broke down, with interbank transactions collapsing and the payments system paralyzed.

The debt restructuring was ultimately concluded two years following the default and encompassed US\$71.6 billion at pre-crisis exchange rate levels and involved private sector restructuring, a Paris Club treatment, and a London Club restructuring. The exchange with private creditors took only six months. Though the offer was criticized as unilaterally imposed and discriminatory, it received nearly 99 percent support. Non-residents ultimately received approximately five cents on the dollar, though the loss was largely attributable to devaluation. The Paris Club agreement, reached in January 1999, provided a flow rescheduling for Soviet-era debt of US\$8 billion—or 4.6 percent of public debt. Agreement was reached with the London Club² in August 2000 and provided an over 50 percent haircut on \$31.9 billion in bank loans.

Russia recovered from the crisis over the following years and was again rated as investment grade by Moody's in October 2003.

² While initially led by the London Club Bank Advisory Committee, the committee of nineteen international banks broke down, and creditors ultimately exchanged their debt bilaterally.

Sources: IMF (1999a, 1999b, pp. 107–12); Kharas et al. (2001); Chiodo and Owyang (2002); Sturzenegger Zettelmeyer (2005); Olivares-Caminal (2009, ch. 4); Pinto and Ulatov (2010); Erce (2013).

Default on banks and bondholders

Rieffel (2003) and others have suggested that “there is a general impression that bonds are senior to bank loans.” This observation has empirical support, with Schlegl et al. (2017) finding bank loans more likely to face payment arrears than bonds, especially in recent years.¹⁰ Over the past forty years, it is also true that bank loans of emerging market sovereigns have been restructured more frequently than bonds (Cruces and Trebesch 2013); it remains to be seen if the trend continues in the face of the increasing share of sovereign bonded debt.

¹⁰ Bonds appear to have become more senior over time. The data show that during the 1980s and 1990s, the relative scale of arrears on bonds and bank loans are comparable. Indeed, one of the reasons for the boom in bank lending to sovereigns in the 1970s was a belief that bank loans were *harder* to renegotiate than bonds.

It is important to note that a default on bonds does not limit the damage to one type of creditor; bondholders include investment funds, pension funds, and even official entities such as central banks and sovereign wealth funds. Importantly, banks themselves are fairly large holders of government bonds, making the distinction between bank loans and bonds artificial when looking at the effect on banks. For example, Gennaioli et al. (2014) find that default on bonds can decrease the liquidity of domestic banks, particularly in countries with better-developed financial institutions (see Section 4 below on the cost of default).

B. Default by debtor action

Defaults can also be categorized by actions that the debtor takes, irrespective of which creditors stand on the other side.

Technical default

“Technical default” is not a legal term. As we suggest in the first part of this chapter, the phrase connotes a formal but ultimately unimportant breach. Which breach is important is in the eye of the beholder (hence our proposed choice of reputable and impactful third-party definitions). For example, the European Banking Authority (2017) defines a technical default (also called a “technical past due situation”) as occurring only where the default was the result of (a) a “data or system error of the institution”; (b) “failure of the payment system”; (c) the time lag between payment and receipt; or (d) certain specific issues in factoring arrangements. Some others consider a “technical default” a non-payment that is cured within three months without an announcement of default (e.g., Schwarcz 2014).¹¹

A few examples of historical defaults that some observers consider “technical” demonstrate to what type of events the term generally applies. In July 1998, Venezuela missed a payment on a local-currency bond with no grace period. The coupons were paid with a one-week delay, and the government claimed the problem was that the check signatory had been unavailable. The credit ratings agency Moody’s considered this a technical default but, due to a pattern of similar missed payments, downgraded Venezuela’s rating from

¹¹ Some have also defined “technical default” in a broader sense, including episodes in which all payments are actually honored, but a sovereign makes a rescheduling offer on less favorable terms than the original debt (Reinhart and Rogoff 2009, citing practices by Moody’s and S&P). For a further discussion on such “distressed exchanges,” see Section 2.B, above.

B2 to Caa1 (Moody's Global Credit Research 2008). A longer-running saga—that of Argentina's payments to exchange bondholders blocked by court injunction, mentioned above in Section 1.A—was also labeled by some observers, such as the United Nations Conference on Trade and Development, as a “technical” one (UNCTAD 2016).

Repudiation

Repudiation, described in Section 1.C, is rare in modern times.¹² Repudiations most often occur after a regime change, and examples of repudiations include those in the wake of communist revolutions—such as Russia in 1917 or China in 1949.¹³ Repudiation is occasionally associated with the concept of “odious debt,” which posits that a government is not obligated to pay for those debts incurred by a previous government contrary to the interests of the public.¹⁴ Though the concept has strong moral appeal, it is difficult to define odious debt in a sufficiently limited way to allow its practical application (Reinhart and Rogoff 2009).¹⁵ The doctrine has not gained traction with arbitrators, courts, or credit rating agencies (Gelpern 2007; Blair 2014) and, the earlier example of Ecuador aside,¹⁶ states tend not to assert it explicitly.

Hard vs. soft

Defaults are often categorized as either “hard”/“unilateral” or “soft”/“negotiated,” though the exact meaning of these terms often depends on the speaker. The key consideration across the board, however, is whether the debtor is presenting creditors with nonpayment as a *fait accompli*, or proactively engaging with its creditors on the terms of a default and restructuring. As discussed in Section 1, this is a set of definitions used in the literature that conflates default (an event) with actions taken during the restructuring (a process). However, because this group of definitions is so widely used, it is important to understand it.

¹² In an earlier era, the repudiation of a predecessor government's debt was a common feature in treaties ending armed conflict—e.g., Treaty of Campo Formio of 1797 (France and Austria). Other repudiations followed significant regime changes—e.g., Spain in 1824.

¹³ Moody's Sovereign Analytics (2008) and Sturzenegger and Zettelmeyer (2007) provide examples.

¹⁴ For a further examination of this doctrine, see Blair (2014), Gelpern (2007), Buchheit et al. (2007), Jayachandran and Kremer (2006).

¹⁵ To get around the difficult determination of which particular debts should be considered odious, Bolton and Skeel (2011), for example, propose an “odiousness of the regime” approach rather than the traditional “debt-by-debt” approach.

¹⁶ See Feibelman (2010) for an argument that the government's justification for default does not meet the traditional definition for “odious debt” in that it does not show that “the citizens did not obtain meaningful benefits from the underlying transactions.”

The literature generally depicts a “hard” or “unilateral” default as a combination of payment default and an aggressive restructuring posture, where the debtor refuses to negotiate with creditors in good faith (Andritzky 2006; Enderlein et al. 2012; Trebesch and Zabel 2017). Such cases may be more closely associated with creditor lawsuits, deep net present value reductions, and capital controls. Debtor–creditor interactions take place against the background of large information asymmetries.

In a “soft” or “negotiated” default, by contrast, the debtor engages proactively with creditors to reach a consensual solution.¹⁷ Generally, a soft default would allow for comprehensive market soundings and informal negotiations with creditors, information sharing, and an offer that could take a menu approach with different options. Of course, this classification is subjective—one man’s market sounding is another’s take-it-or-leave-it offer. In reality, defaults and restructurings fall somewhere between these two extremes. Examples of defaults often classified as “hard” include the cases of Argentina in 2001 (see Chapter 8) and Russia in 2000 (see Case Study 7.2), while Uruguay’s 2003 restructuring provides an example of a “soft” approach (see Case Study 7.2).

Partial vs. full

The literature has also differentiated between “partial” and “full” defaults, typically by considering the amount being defaulted on, though there is significant disagreement over where the boundary lies. Some authors, including Arellano et al. (2019), consider that sovereign debtors only ever partially default, as debtors will always continue to pay some portion of their debt—and often continue to borrow new amounts. Others, such as Eichengreen (1991), consider countries that miss “more than a small fraction of interest payments” to be “heavy” or full defaulters.

A very related concept is that of “selective default,” where sovereigns default on some creditor classes while sparing others. For a detailed discussion see Erce (2012) and Schlegl et al. (2017).

Haircut style: rescheduling vs. face value reduction

When default coincides with restructuring, it is often classified according to the extent of ultimate creditor losses. At one end of the spectrum are deep restructurings, where creditors receive new instruments reflecting significant

¹⁷ Where the debtor continues to abide by the payment and other terms of the contract, this would not constitute a legal default. For a further discussion of distressed exchanges, see Section 2.A, above.

net present value (NPV) reductions, or “haircuts.” The underlying purpose of such restructurings is to reduce the overall sovereign debt burden, which typically entails principal write-offs and large creditor losses. At the other end of the spectrum are light restructurings, which preserve the principal and most other terms of the original debt contract, but extend its maturity. These operations are functionally identical to rolling over an existing obligation, and are variously called “rescheduling,” “refinancing,” and most recently, “reprofiling” (these terms are used interchangeably and mean the same thing). Unlike restructurings, reschedulings typically involve small NPV reductions (low haircuts) (Cruces and Trebesch 2013). Both restructurings and reschedulings entail departure from the original debt terms—the difference is of degree.

The most important decision when calculating haircuts is which discount rate to use to calculate the present value of the debt payment streams. The convention in the economic literature, following Sturzenegger and Zettelmeyer (2008), has been to use the “exit yield” for both the old and the new debt, meaning the yield on the newly issued instruments on the first day they are traded. This differs from the approach used in corporate bankruptcies by rating agencies such as Moody’s or Standard & Poor’s (S&P), which typically take the secondary market price of a bond 30 days after the default to estimate the size of haircuts (or 1 minus the recovery rate). The approach of Sturzenegger and Zettelmeyer (2008) is more comparable to the concept of “ultimate recovery” in corporate finance, also used by Moody’s, which focuses on the market price of a bond at the emergence from default (see Meyer et al. 2019 for a discussion and a comparison between the concepts).

While an NPV-based concept of haircuts is a useful metric to compare the depth of different restructurings, it is important to keep in mind that such a computed haircut may not—and generally does not—measure the actual loss (or gain) for a creditor in a debt exchange. The realized loss or gain for a creditor in a trade is based on the price at which they bought the security, compared to the price at which they sold that security or the new security they received in a debt exchange (or its market value in the case of calculating the unrealized loss/gain associated with the trade). Creditors can make large financial gains through a restructuring if they buy the debt at deeply discounted prices in the secondary market before the exchange, and the new securities received in the exchange rally after its completion, perhaps because restructuring terms turn out to be better than what the market had priced, or because the debtor’s creditworthiness is perceived to have significantly improved. New research suggests that investors are generally compensated for

the risk of defaults and haircuts. Using long-run data, Meyer et al. (2019) show that investors holding a broad portfolio of risky sovereign bonds achieve a risk–return ratio comparable to that of US equities, despite frequent defaults and major crises.

3. Why Do Defaults Occur?

This section examines the drivers of sovereign default. The question of why and when governments default can also be turned around, by asking: “Why do countries ever repay?,” which is arguably *the* fundamental question in the literature on sovereign debt. As emphasized by Bulow and Rogoff (1989a), reputation concerns and purely economic considerations are probably not sufficient to explain why debtors repay. Legal and institutional considerations, in particular enforcement threats, are important to understand the determinants of default and repayment (see also Uribe and Schmitt-Grohe 2017 and Schumacher et al. 2018). The relative importance of enforcement and reputation sanctions in sovereign decisions to repay or default remains at the heart of ongoing debates in economics (see e.g., Tomz 2007; Mitchener and Weidenmier 2010; Aguiar and Amador 2014).

To set the stage, one can think of debt crises as a result of either “mismanagement,” meaning bad financial and macroeconomic policymaking at home, and/or of “misfortune,” mainly due to external shocks such as a sudden spike in global interest rates, crises in financial center countries, commodity price swings, or natural disasters. In practice, a clean distinction between these two causes is difficult. In particular, it is well-known that countries can implement precautionary macroeconomic and fiscal policies that help to buffer and manage external shocks when they occur. Despite this, it is useful to summarize the findings from the early warning literature on defaults by looking at domestic determinants (Section 3.A) and external determinants (Section 3.B) separately. This distinction can also be applied to the Eurozone debt crisis of 2010–12, which has been characterized by some as a crisis of economic fundamentals and reckless over-borrowing by domestic politicians, while others emphasize the role of cross-border contagion, debt runs by foreign investors, and self-fulfilling default expectations (see Section 3.C). In this context, we will also summarize studies on legal drivers of default in Europe and beyond, in particular the impact of bond clauses and jurisdiction choice for sovereign risk and recovery rates (Section 3.D).

A. Mismanagement: domestic determinants of default

To study the domestic determinants of sovereign default Manasse and Roubini (2009) distinguish between *liquidity* and *solvency*. Simply put, liquidity crises are episodes with rollover problems, meaning difficulties in refinancing short-term debt, while solvency crises are marked by a high debt burden.¹⁸ Their analysis shows that the risk of default due to *illiquidity* is especially high if short-term debt exceeds 130 percent of reserves. Above this threshold, defaults can even occur at moderate levels of debt to GDP.

With a view to *insolvency*, Manasse and Roubini (2009) find that the risk of default is particularly high in case of a high stock of *external* debt (in excess of 50 percent of GDP), while the level of total public debt to GDP is a less useful warning indicator. In line with this, Reinhart et al. (2003) show that a high public debt burden alone is not a good predictor of when and why countries default. Using long-run data they show that some countries are “debt intolerant” and have defaulted at debt/GDP ratios of just 20 percent, while others have tolerated debt stocks above 100 percent of GDP for decades without running into distress. At the same time, the authors show that the *credit history* of a country is a crucial predictor of default. All else equal, advanced economies and emerging market countries that have never defaulted are much less likely to run into debt problems than “serial defaulters,” with a high historical default probability.

The risks of external debt are also studied by Catão and Milesi-Ferretti (2014) who show that the ratio of net foreign liabilities (NFL) to GDP is an important predictor of sovereign debt crises, especially if this ratio surpasses 50 percent. The recent Eurozone crises fit into this picture, as much of the debt of countries such as Greece or Portugal was owed to foreign, not domestic creditors. *External dependence* thus appears as a dominant explanation for serial debt problems, not just in Europe, but also in Argentina and many other countries that have relied on foreign debt and defaulted again and again (Reinhart and Trebesch 2016).

Beyond solvency and liquidity indicators, recent years have brought to the fore another domestic trigger of sovereign distress, namely banking crises and *sovereign-financial “doom loops”* (Farhi and Triole 2012). Using 200 years of data, Reinhart and Rogoff (2011) show that domestic banking crises are often followed by a sovereign debt crisis, partly due to the large fiscal costs associated with a financial crash. Negative spillovers from bank balance sheets to

¹⁸ For sovereign debtors, the distinction between illiquidity and insolvency is blurry, as liquidity crises can result in a situation of insolvency, while crises of insolvency are often triggered by refinancing problems. See Section 3.C below and Chapter 4.

the sovereign also played a major role during the Eurozone crisis, as documented by Acharya et al. (2014). Announcements of large financial bailouts between 2010 and 2012 were followed by a strong and immediate increase of sovereign risk measures such as CDS spreads. Similarly, Ang and Longstaff (2013) show that systemic sovereign risk is highly related to financial sector distress, rather than macro fundamentals. Finally, economists have also identified domestic macroeconomic volatility (Catão and Kapur 2006) or domestic political and institutional factors as relevant drivers of sovereign risk (Kohlscheen 2007; van Rikieghem and Weder 2009; Enderlein et al. 2012; Trebesch forthcoming).

B. Misfortune: external determinants of default

External shocks are a main reason why countries default on their debt, especially during systemic debt crises that occur in multiple countries simultaneously (Kaminsky and Vega Garcia 2016). Sturzenegger and Zettelmeyer (2006) study the main sovereign default clusters of the last 200 years and find external factors to be decisive, in particular (i) a worsening of the terms of trade; (ii) a recession in the core countries that acted as providers of capital; (iii) an increase in international borrowing costs, for example, due to tighter monetary policy in creditor countries; and (iv) a crisis in an important country that causes contagion across trade and financial markets. These findings are in line with Reinhart et al. (2016, 2018) who show that a collapse of international capital flows and commodity markets are a powerful predictor of default. Five of the six main waves of external default since 1815 were preceded by such a “double bust,” meaning a sudden stop in global capital flows that coincides with a collapse in global commodity prices. Kaminsky and Vega Garcia (2016) further show that terms of trade and export shocks have typically preceded defaults in Latin America, while Hilscher and Nosbusch (2010) show the volatility of terms of trade shocks to be a main driver of sovereign bond spreads. The role of sudden stops in capital flows is further examined by Mendoza (2010), while the link between commodity prices and sovereign risk is studied in a more granular way by recent work of Hamann et al. (2018) and Dominguez et al. (2018).

C. Can debt crises be self-fulfilling?

The idea that debt crises could be self-fulfilling goes back to Calvo (1988) and Cole and Kehoe (2000), among others. They show that the probability

of default largely depends on investor expectations and that there can be multiple equilibria in crisis times. During the Eurozone crisis, this notion has regained new prominence. De Grauwe and Ji (2013), for example, show evidence that, at the peak of the crisis, sovereign spreads were mostly driven by market sentiment and had decoupled from macroeconomic fundamentals or risk indicators such as debt/GDP. Beirne and Fratzscher (2013) also find that a large part of the increase in the level and dispersion of bond spreads during the Eurozone crisis cannot be explained by fundamentals. They distinguish between “pure contagion” or herding panics and “fundamentals contagion,” meaning a crisis-induced increase in market sensitivity to fundamentals, which was the main contagion channel during the Eurozone crisis according to their results (see Dell’Ariccia et al. 2006 for a similar result for emerging markets after the Russian crisis). Bocola and Dovis (2016) provide a more theory-driven assessment on the role of fundamentals versus self-fulfilling crisis expectations. They find that rollover risks (or self-fulfilling crisis risk) can explain only a small part of the Italian bond spreads during the crisis, while economic fundamentals play the dominant role.

The overall take away from recent research is that there can indeed be more than one equilibrium in crisis episodes and that excessive debt accumulation and weak fundamentals can therefore “leave sovereign borrowers at the mercy of self-fulfilling increases in interest rates” (Lorenzoni and Werning 2013). Precautionary policies *ex-ante* can help countries to avoid entering this “crisis zone” in the first place, for example via a fiscal rule (e.g., Conesa and Kehoe 2016; Lorenzoni and Werning 2013), while cross-border bailouts or central bank interventions can prevent or mitigate self-fulfilling dynamics *ex-post* (e.g., Corsetti and Dedola 2016; Corsetti et al. 2017; Roch and Uhlig 2018). Furthermore, Chamon (2007) suggests relying on state-contingent debt (such as GDP-linked bonds) to reduce the likelihood of self-fulfilling runs.

D. Legal determinants of default: do contract terms matter?

Policy and academic debates about sovereign debt contract reform occasionally imply that contract terms which make debt restructuring more orderly, such as CACs, should also make default easier, more attractive, and therefore more likely. However, studies have failed to find consistent evidence that terms described by market participants as “legal” or “process” terms—capturing all

but the core economic bargain—increase sovereign debt prices at issue (e.g., Becker et al. 2003; Eichengreen and Mody 2004).

The puzzle that CACs and related terms have no (or limited) impact on bond pricing has occasionally been explained as a matter of offsetting effects: default may be more likely, but recovery values are higher if the subsequent restructuring process goes smoothly. However, if creditors find smoother restructuring attractive, the “upside” of process terms should become more salient as the sovereign slides into distress (default probability approaches 100 percent), so that contracts with CACs and similar terms that facilitate orderly restructuring should be priced more favorably (see e.g., Carletti et al. 2018). Instead, studies find growing price penalties for process terms as default draws near (e.g., Carletti et al. 2016; Chamon et al. 2018).

Future studies could help illuminate the relevance of contract terms for the default probabilities and recovery values. Interviews with debtors, creditors, and other market participants suggest that they associate legal or process terms with recovery values, but view their impact on the probability of default as simply too uncertain an issue (Gelpern et al. 2019).

4. The Cost of Default

Sovereign defaults can be costly for governments and investors alike and cause collateral damage to the economy of a defaulting country. This section summarizes these costs.

A. Loss of market access

The theoretical literature typically assumes that defaults and distressed restructurings lead to the exclusion of sovereigns from international capital markets, as well as to an increase in borrowing costs afterwards (see, e.g., Eaton and Gersovitz 1981; Arellano 2008). The empirical results, however, are mixed.

Overall, there is a consensus that defaults do hurt the conditions under which governments can borrow abroad and at home, but there is disagreement around how persistent this effect is. For example, the survey by Panizza et al. (2009) indicates that defaults increase borrowing costs (risk spreads) markedly, but only in the first two years post-default. Similarly, Gelos et al. (2011) document that most defaulters regain access to international markets within just one or two years after a crisis. These findings are in line with

older studies¹⁹ and suggest that investors have short memories. In contrast, more recent work by Cruces and Trebesch (2013) and Catão and Mano (2017) account for the severity of default, measured by the size of haircuts or the length of the default, and find evidence for a more persistent, sizable default premium, of 200 basis points, and a longer exclusion period from international markets.

One channel by which defaults affect market access and borrowing costs are credit rating downgrades. It is well-known that ratings decrease markedly before and after sovereign default events (see, e.g., S&P 2018). Post-default ratings can also remain low for long periods, deterring institutional investors from buying and holding these low-rated bonds. Indeed, defaults and downgrades can result in portfolio relocation effects, also because distressed debt instruments are often excluded from benchmark indices. JP Morgan's EMBI index, for example, drops bonds when they become illiquid and have unreliable pricing, which is often the case in default, especially in protracted defaults. Give the current boom in index investing, these types of index exclusions are likely to be increasingly costly for sovereigns in distress.

B. Collateral damage to the economy

The idea that default may cause “collateral damage” to the economy is nothing new. Cole and Kehoe (1998) develop a model of generalized reputation which suggests that default triggers reputational spillovers that adversely affect not only the sovereign credit market but also other fields of the economy (see also Bulow and Rogoff 1989b). In line with this, a large literature has studied the link between default and various economic outcome variables.

First, sovereign debt crises are accompanied by a significant drop in *economic growth*, as shown in more than a dozen studies. Borensztein and Panizza (2009), Furceri and Zdzienicka (2012), and Kuvshinov and Zimmermann (2016), for example, use cross-country panel data to show that defaults are associated with 2 to 6 percentage points lower growth in the first years of the crisis. There is also a consensus that the fall in output is particularly large when defaults are accompanied by banking crises (see, e.g., De Paoli et al. 2009; Kuvshinov and Zimmermann 2014). Furthermore, recent work has

¹⁹ The influential studies by Lindert and Morton (1989) and Özler (1993) find that the average default penalty is not sizable, and leads to an average increase in spreads of, at most, 50 basis points in years one or two after the crisis. Additional evidence, going back farther in history, is provided by Jorgensen and Sachs (1989).

zoomed in on the aggregate relationship between default and growth. Levy Yeyati and Panizza (2011), for example, use quarterly data to show that, on average, output contractions *precede* defaults and that the recovery starts right after the default. Tomz and Wright (2007) show that the relationship between default and output since 1820 is unexpectedly weak and that countries have also defaulted in “good times.” Trebesch and Zabel (2017) show that the output losses are more pronounced in “hard” defaults.

Moreover, the literature has documented a negative correlation between default and (i) trade, (ii) foreign direct investment, and (iii) domestic firms in the defaulting country. Regarding trade, Rose (2005) estimates a gravity panel and shows that, following sovereign debt restructurings, trade falls bilaterally by about 7 percent per year and for more than ten years. Both Martinez and Sandleris (2011) and Mitchener and Weidenmier (2010) show that the observed drop in trade during debt crises is mostly due to a “general” effect rather than a bilateral punishment channel. In a similar setup, Fuentes and Saravia (2010) show that countries that undergo a debt restructuring see their FDI flows drop by up to 2 percent of GDP per year. Recent work by Asonuma et al. (2016) suggests that the type of default influences the size of the decline in exports.

For domestic firms, Hébert and Schreger (2017) use data from Argentina to show that a sovereign default significantly reduces the value of domestic firms on the stock market, especially for exporters and foreign-owned companies. In earlier work, Arteta and Hale (2008) and Das et al. (2012) find that sovereign debt crises are accompanied by a sizable drop in external borrowing by domestic firms. This indicates that corporations in defaulting countries face difficulties in accessing foreign capital markets. Borenzstein and Panizza (2010) and Zymek (2012) also focus on this credit channel and provide evidence that defaults hurt those sectors and exporters most that are dependent on foreign financing. These findings are in line with the theoretical model of Mendoza and Yue (2012) in which defaults increase the cost of borrowing abroad and, thus, the cost of paying for imported inputs. The resulting shift to domestic inputs causes efficiency losses in domestic production and lowers growth.

C. Spillovers to the domestic banking sector

Sovereign default can cause major damage on banks and other systemically relevant institutions, especially if they hold large amounts of government

debt. This type of “top-down” sovereign-financial spillover has played an increasingly important role in recent years, most visibly during the Eurozone crisis. Indeed, there is a consensus that heightened sovereign default risk in economies with a large financial sector can result in an aggregate credit shortage, less investment and possibly a banking crisis and an output decline (e.g., Acharya et al. 2014; Perez 2015; Bocola 2016; Engler and Grosse Steffen 2016, Sosa-Padilla, forthcoming).

A widely cited paper on the link between sovereign default and banks is Gennaioli et al. (2014), who find that sovereign defaults are followed by large drops in private credit and that this post-default credit crunch is stronger for countries in which banks hold more government debt. In follow-up work, the same authors use finer-grained data and again find a strong negative correlation between a bank’s holdings of government bonds and its lending during sovereign defaults (Gennaioli et al. 2018). Acharya et al. (2018) and Bofondi et al. (2017) reach a similar result when linking data on a bank’s holdings of sovereign debt and that bank’s lending activity.

D. Creditor lawsuits: the legal costs of default

Other important concerns for policymakers in the context of default are legal risks (threat of litigation) and the costs arising from the so called “holdout problem” (see Chapter 8; Panizza et al. 2009; Buchheit et al. 2013). Overall, the evidence shows that sovereign immunity has eroded since the 1970s, strengthening the hands of creditors and raising the legal cost of default for debtors, with implications for government willingness to repay.

The Argentine debt crisis after 2001 is the best-known example of how large the legal costs of default can become. Dozens of hedge funds filed suit against Argentina in New York, litigated for full repayment, and repeatedly attempted to seize Argentine assets abroad. Fifteen years later, those holdout creditors achieved a major victory in court, which ultimately forced the Argentine government into a settlement of more than \$10 billion—a multiple of the debt’s original face value (Hébert and Schreger 2017).

Argentina is not an exception but is part of a general trend, as shown by Schumacher et al. (2018). Building on a new dataset on sovereign debt lawsuits, these authors document that the risk of litigation in the context of a sovereign default has greatly increased since the 1980s.²⁰ Furthermore, they

²⁰ The risk of litigation is particularly high for sovereigns imposing a high haircut on large amounts of debt (Schumacher et al. 2015).

show that legal disputes can disrupt government access to international capital markets, as foreign courts impose a financial embargo on defaulting sovereigns. Legal risks are therefore one possible channel explaining why governments lose market access.

In recent years, the risk of creditor holdouts and litigation has only continued to increase. Schumacher et al. (2018) document that, unlike in the 1990s or early 2000s, governments in distress now frequently point to legal risks when explaining their policy choices, and the same is true for rating agencies justifying up- or downgrades. In line with this, Buchheit et al. (2013) argue that the fear of a protracted legal disputes with creditors, as in Argentina, was one of the reasons many Eurozone governments decided to avoid a default or debt restructuring. The only Eurozone default occurred in Greece, but even there legal risks played an important role. Confronted with legal risks, the Greek government decided to repay holdouts on foreign-law bonds in full and on time, allowing them to escape the haircut imposed on all other creditors. The resulting transfers amounted to more than 2 percent of Greek GDP (Zettelmeyer et al. 2013).

5. Reducing the Incidence and Costs of Default

This section examines the literature on experience with the incidence and cost of default, although it necessarily discusses the process of restructuring as well. The section is organized as follows. Section 5.A documents the “too little, too late” problem: whether or not a country defaults, restructurings are often delayed and when they do take place they often don’t entail a deep enough restructuring to definitively restore sustainability. Hence they end up being more costly. Section 5.B reviews some possible factors behind such outcomes, discussing both the incentives of debtors as well as official creditors. Finally, Section 5.C briefly discusses what can be done and has been done to make default and restructurings less likely and to reduce their associated costs.

A. Too little, too late: timing and depth of restructuring

Sovereigns, as well as other key stakeholders in a restructuring process such as official creditors, have a tendency to delay defaults and necessary restructurings (the “too late” problem). According to IMF (2014), about 80 percent of the countries that experienced a restructuring had a sustained high debt

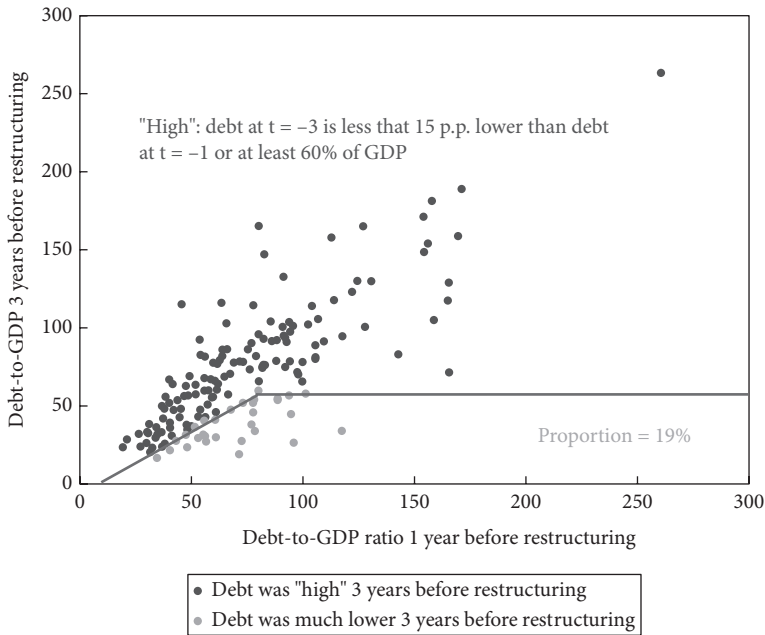


Figure 7.2 Delayed restructurings

Source: IMF (2014).

level three years before the date of the restructuring (Figure 7.2). Delayed restructurings are costly, first and foremost to debtors but also to creditors. House et al. (preliminary, 2017) find that the longer it takes to announce a restructuring, the bigger the cumulative output losses, the larger the haircuts for creditors, and the more costly the subsequent borrowing for the sovereign. For debtors, a situation of debt overhang depresses investment and growth and creates a sense of financial uncertainty that can raise the eventual magnitude of resolving the debt problem. For countries experiencing debt distress and which are considering approaching the official sector for assistance, creditors have an incentive to lend on shorter maturities recognizing that they have a higher chance of being bailed out. This in turn distorts the incentives of the country to favor short-term borrowing, further worsening its debt profile. For creditors, delayed restructurings, particularly when some private creditors are paid out in the interim, imply that those that are left, or who lent on longer maturities, will have to absorb a greater loss. Case Study 7.3 provides the example of Greece in 2012. This also applies to official creditors who may themselves initially want to delay addressing a debt problem through a restructuring but end up increasing risks to their own prospects of being

Case Study 7.3 Greece 2012—delayed restructuring

A prominent example of a delayed restructuring, exacerbated by external factors, is Greece. As explained in detail by the IMF's Independent Evaluation Office (2016), when Greece approached the IMF in May 2010, its debt situation did not meet the bar required by the IMF to lend it large amounts. Instead of withholding IMF financing until Greece undertook a debt operation that would bail in private creditors—the normal requirement under IMF policies—it was decided in the context of approving the loan to Greece to change the IMF's policies to allow it to bail out private creditors with official resources. The key motivation underlying this decision was the fear that a bail in of private creditors—primarily European banks—would raise the costs of resolving the crisis through contagion to other high-debt euro area sovereigns and banks given the significant systemic spillover risks. Besides, there was a chance that Greece might be able to pull itself out of its difficulties and regain market access. In the event, contagion worsened after the bail out, Greece's debt profile became more rigid due to a higher share of official debt, and the remaining private creditors received a deep haircut in 2012—deeper than would have been necessary if other private creditors had not been paid out in the interim.

repaid, especially if their resources are used to pay out private creditors during a prolonged period of debt distress.

When restructurings have taken place, they have often failed to restore debt sustainability and market access, leading to repeated restructurings and dependence on official financing (the “too little” problem). The literature finds that more comprehensive initial restructurings lessen the likelihood of repeat restructurings—relatively low haircuts often presage serial restructurings (Reinhart et al. 2003; Schroeder 2015; Mariscal et al. 2015; Asonuma 2016; Ghosal et al. 2016). A famous example from earlier times is Poland. It went through six restructurings with private creditors and four with the Paris Club between 1981 and 1990, mostly consisting of rescheduling of principal and interest. The debt problem was not fully resolved until the Paris Club granted 50 percent debt forgiveness in 1991 and, after lengthy negotiations, private banks agreed to a 45 percent debt reduction in 1994. According to IMF (2014), from 1980 to 2012, of the forty-four countries that restructured their debt, 86 percent had more than one restructuring. This pattern emerged in

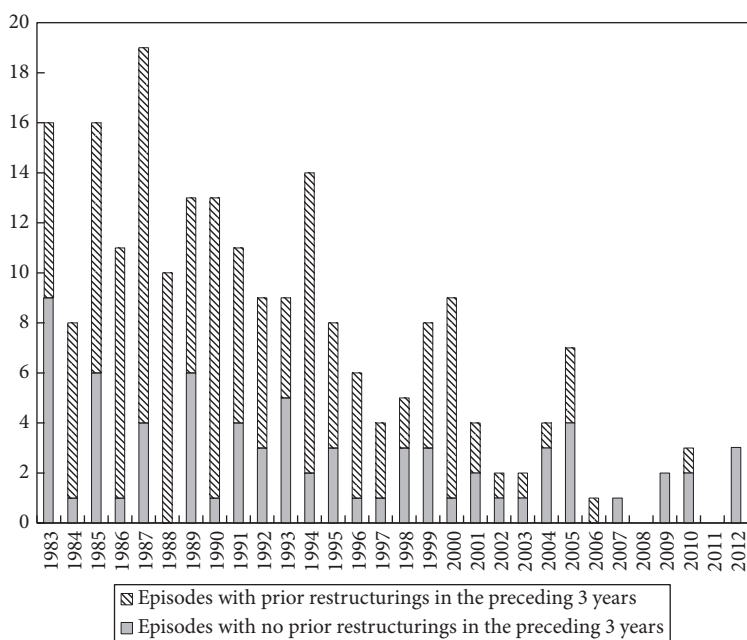


Figure 7.3 Repeat restructurings

Source: IMF (2014); Reinhart and Rogoff (2009); Das et al. (2012); and Cruces and Trebesch (2013).

restructurings with both private and official creditors; on average each country had over five restructurings, of which about half were with private foreign creditors (Figure 7.3). Repeat restructurings suggest that a one-time restructuring was often not enough to solve the debt problem. On average, two-thirds of all restructurings with private foreign creditors did not successfully establish sustainability and led to repeat restructurings.

B. Causes of delayed and inadequate restructurings

Why are restructurings delayed and often insufficient to definitively restore sustainability? The latter part of this question may be easier to answer. Inadequately-sized restructurings may be linked to the desire to avoid the costs associated with large debt reductions. The available literature finds that significant debt reductions are associated with higher economic costs and lengthier market exclusion (Cruces and Trebesch 2013; Trebesch and Zabel 2017). However, while it is intuitive that a deeper restructuring may cause greater costs and spillovers, it is not clear why repeated restructurings are considered a better outcome than a “one-and-done” approach. Indeed,

Reinhart and Trebesch (2016) find that countries in a situation of chronic debt overhang tend to grow again only after significant debt relief agreements involving face value reductions, such as the Brady deals of the 1990s or the cancelation of war debts after 1932. Similarly, Mariscal et al. (2015) find that shallower debt treatments, which have a lower cost individually, may not solve the underlying debt problems, noting that over 40 percent of such treatments are followed by another within six years.

With regard to bilateral official creditors, the incidence of many repeat restructurings may reflect the political difficulties associated with giving a principal reduction. Repeated flow treatments have been a common experience of the Paris Club as in Poland, as noted earlier. Moreover, the countries that have gotten significant stock reductions have all been politically significant cases: Poland (in 1991 to woo it away from the Soviet Union after the break up), Egypt (to reward it for its support to the western countries during the 1991 Persian Gulf War), and Iraq (after the Second Gulf War).

The reasons why restructurings are initiated with delay may be more complex. On the one hand, an inclination to delay is no surprise. Debtor governments fear the economic, financial, and political fallout of a default and restructuring, particularly if the domestic financial sector hold a significant amount of public debt (e.g., Jamaica). Private creditors will also naturally wish to avoid a debt restructuring if at all possible and will therefore press for a bailout by the official sector. Finally, official creditors may also have incentives to delay a restructuring or default out of concerns that this would reduce incentives for the debtor country to adjust, force banks located in official lenders' countries to recognize losses, and trigger market turmoil affecting similarly situated countries, or to preserve flexibility for the future.

However, when a debt restructuring is the only option to deal with a distressed situation, it is not clear how the debtor country or the official sector help themselves by delaying the inevitable.

C. Reducing the costs of restructurings

It would be naïve to suppose that countries will take heed of the foregoing discussion on the costs of default and always abstain from policies that could put them in a situation of debt distress. It would be similarly naïve to suppose that private creditors will always work with the debtor to find ways for timely and adequately sized restructurings that would be less costly. However, very often, a decision to default or restructure comes about in the context of a lending

program from the official sector, most typically from the IMF. Therefore, the international financial policy architecture and particularly the policy framework of the IMF that governs when and how much it can lend may affect the incidence and cost of default. This section, therefore, examines that framework.

One of the key changes brought about by the IMF in 2016 was the change to its policy for giving large loans (the “Exceptional Access Policy”). Prior to changes made in the context of lending to Greece 2010 (see Case Study 7.3), the IMF’s exceptional access policy required that if the IMF could not say with “high probability” that a crisis-struck country’s debt position was sustainable, the IMF could not lend absent a debt restructuring sufficiently deep to satisfy this condition. This approach had merit for cases where debt was considered clearly unsustainable. However, it was too rigid for cases where debt was considered sustainable but risks around the debt outlook did not allow this assessment to be made with high probability (i.e., sustainability was in the “gray zone”). In such cases, it could be sufficient to give a chance to a lighter restructuring—a reprofiling or an extension of maturities—which would improve debt sustainability and help the country overcome the crisis without incurring the costs of a deeper restructuring. The key change in the Exceptional Access Policy in 2016 was to introduce such flexibility into the IMF’s lending framework and better tailor lending options to the country’s debt situation as illustrated by Figure 7.4. In line with the “too little” problem

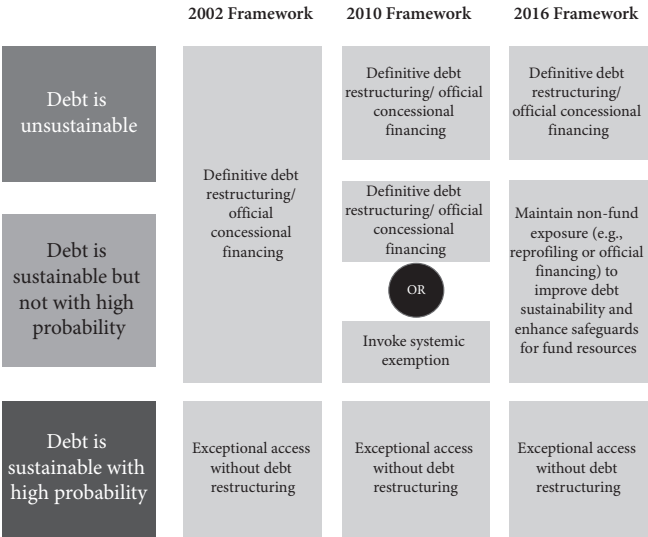


Figure 7.4 Changes to the IMF’s lending framework
Source: IMF (2015a)

discussed above, however, the IMF did note that repeat reprofiling should be avoided—if an initial reprofiling failed to dispel concerns, a deeper debt reduction would be needed.

The introduction of such flexibility into the lending framework also allowed the Fund to do away with the “Systemic Exemption.” The Exemption was introduced in 2011 in the context of lending to Greece due to contagion-related concerns and allowed the IMF to provide financing in exceptional levels after 2012 if there was “a high risk of international systemic spillovers” (see Case Study 7.3). In hindsight, the experience with the use of the systemic exemption revealed that while there may have been important considerations behind its introduction, it did not help address the underlying problem. By severing the link between underlying debtor risk and yields, the Exemption encouraged moral hazard and over-borrowing ex-ante, and exacerbated market uncertainty in periods of sovereign stress, as traders bet on whether the Exemption would be activated, rather than focusing on underlying sustainability fundamentals. The exemption also reduced safeguards for use of IMF resources, since if a debt restructuring was eventually needed, a smaller pool of private creditors would be available to absorb losses.

Annex 1 Examples of events of default—payment default, covenant default, and cross-default in foreign-law tradable sovereign debt securities

Italy 2013
(New York Law, Fiscal Agency)

Default; acceleration of maturity

Each of the following is an event of default under any series of debt securities:

- We default in any payment of principal, premium or interest on any debt securities of that series and the default continues for a period of more than 30 days after the due date.
- We fail to perform or observe any other obligation under any debt securities of that series and the default continues for a period of 60 days following written notice to us of the default by any holder.
- Any other present or future Public External Indebtedness in an amount equal to or exceeding US\$50 million (or its equivalent) becomes due and payable prior to its stated maturity by reason of default in payment of principal thereof of premium, if any, or interest thereon.

- Any other Public External Indebtedness in an amount equal to or exceeding US\$50 million (or its equivalent) is not paid at its maturity as extended by any applicable grace period. [...]

Kazakhstan 2014

(English Law, Fiscal Agency)

[...] Events of Default

The Fiscal Agent shall upon receipt of written requests from the holders of not less than 25 percent in aggregate outstanding principal amount of the Notes or if so directed by an Extraordinary Resolution shall, give notice to the Issuer that the Notes are and they shall immediately become due and repayable at their principal amount together with accrued interest if any of the following events (each, an “Event of Default”) occurs and is continuing:

- (a) Non-payment: the Issuer is in default with respect to the payment of interest or additional amounts on any of the Notes and such default continues for a period of 30 days; or
- (b) Breach of other Obligations: the Issuer is in default in the performance, or is otherwise in breach, of any covenant, obligation, undertaking or other agreement under the Notes, other than a default or breach elsewhere specifically dealt with in this Condition 13 and such default or breach is not remedied within 60 days after notice thereof has been given to the Issuer at the Specified Office of the Fiscal Agent by any holder of Notes; or
- (c) Cross Default: (a) any other Public External Indebtedness of the Issuer (i) becomes due and payable prior to the due date for payment thereof by reason of default by the Issuer, or (ii) is not repaid at maturity as extended by the period of grace, if any, applicable thereto, or (b) any Guarantee given by the Issuer in respect of Public External Indebtedness of any other Person is not honoured when due and called upon; provided that the aggregate amount of the relevant Public External Indebtedness or liability under such Guarantee in respect of which one or more of the events mentioned in this Condition 13(c) shall have occurred equals or exceeds U.S.\$65,000,000 or its equivalent in other currencies; [...]

Mexico 2014

(New York Law, Trust Indenture)

Default and acceleration of maturity

Each of the following is an event of default under any series of debt securities:

- Mexico fails to pay any principal, premium, if any, or interest on any debt security of that series within 30 days after payment is due;
- Mexico fails to perform any other obligation under the debt securities of that series and does not cure that failure within 30 days after Mexico receives written notice

from the trustee or holders of at least 25 percent in aggregate principal amount of the outstanding debt securities requiring Mexico to remedy the failure;

- Mexico's creditors accelerate an aggregate principal amount of more than U.S. \$10,000,000 (or its equivalent in any other currency) of Mexico's public external indebtedness because of an event of default resulting from Mexico's failure to pay principal or interest on that public external indebtedness when due;
- Mexico fails to make any payment on any of its public external indebtedness in an aggregate principal amount of more than U.S. \$10,000,000 (or its equivalent in any other currency) when due and does not cure that failure within 30 days after Mexico receives written notice from the trustee or holders of at least 25 percent in aggregate principal amount of the outstanding debt securities requiring Mexico to remedy the failure; [...]

Ghana 2014

(English Law, Fiscal Agency)

[...] *Events of Default*

If any of the following events ("Events of Default") shall have occurred and be continuing:

(a) *Non-payment*

- (i) the Issuer fails to pay any principal on any of the Notes when due and payable and such failure continues for a period of 15 days; or
- (ii) the Issuer fails to pay any interest on any of the Notes or any amount due under Condition 8 (Taxation) when due and payable, and such failure continues for a period of 30 days; or

(b) *Breach of other obligations*

The Issuer does not perform or comply with any one or more of its other obligations under the Notes, which default is incapable of remedy or is not remedied within 45 days following the service by any Noteholder on the Issuer of notice requiring the same to be remedied; or

(c) *Cross-default*

- (i) the acceleration of the maturity (other than by optional or mandatory prepayment or redemption) of any External Indebtedness of the Issuer; or
- (ii) any default in the payment of principal of any External Indebtedness of the Issuer shall occur when and as the same shall become due and payable if such default shall continue beyond the initial grace period, if any, applicable thereto; or
- (iii) any default in the payment when due and called upon (after the expiry of any applicable grace period) of any Guarantee of the Issuer in respect of any External Indebtedness of any other person,

provided that the aggregate amount of the relevant External Indebtedness in respect of which one or more of the events mentioned in this paragraph (c) have occurred equals or exceeds US\$25,000,000 or its equivalent; [...]

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The Restructuring Process

*Lee Buchheit, Guillaume Chabert, Chanda DeLong,
and Jeromin Zettelmeyer*

1. Introduction

This chapter discusses the process of restructuring a sovereign's debt once this step becomes unavoidable. All sovereign debt workouts are painful—for the debtor country, its citizens, its creditors and its official sector sponsors. If mishandled, however, a sovereign debt workout can be incandescently painful. A mangled debt restructuring can perpetuate a sense of crisis for years, sometimes even for decades. A return to normal economic activity may be delayed, credit market access frozen, trade finance unavailable, capital flight endemic, financial sector instability acute, and foreign direct investment withered (Trebesch and Zabel 2017). Adding to these inherent difficulties, sovereign debt crises rarely come in isolation. They are often the cause of, caused by, or at the very least accompanied by, political crises, banking crises, social crises, and occasionally humanitarian crises.

Sovereign debt restructuring negotiations can be complicated by three fundamental problems:

First, debtors and some creditors may have reasons *not* to desire a quick resolution. Extraneous motives may interfere, particularly on the debtor side. Sovereign debtors are governments responding to political incentives. A confrontational approach, although unhelpful from the standpoint of reaching a deal, may be popular with domestic constituencies.

Second, there is almost always an “asymmetry of information” between a debtor and its creditors. Sovereign debtors know their capacity to repay better

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than the creditors because they are in a better position to judge how much adjustment and reform is realistic, as a political and economic matter, to service future debt service obligations. This creates a problem: creditors may reasonably assume that governments are trying to “lowball” them and overcompensate by offering too little debt relief. But the reverse problem also exists: debtors cannot be quite sure how much debt relief the creditors are willing to accept.

Third, there are conflicts of interest not just between the debtor and creditors collectively, but also among creditors. The ability of the debtor to repay an individual creditor, or a group of creditors, will improve the more other creditors agree to debt relief. Hence, each creditor has an incentive to “hold out” for full repayment—that is, free ride on the debt relief agreed by others. This is referred to as the “creditor coordination problem,” or alternatively, the “holdout” problem.

As a result, a sovereign debt restructuring can fail in several ways. It can take too long to execute; it may not provide sufficient debt relief; it may extract debt relief that most creditors see as excessive and confiscatory; or the creditors may view the operation as unnecessarily coercive (Cruces and Trebesch 2013). The extent of the longer-term damage to the sovereign’s credit reputation may well depend on the market’s perception of whether the country behaved fairly and professionally during the period of its debt crisis.

This chapter provides a comprehensive attempt at a “playbook” of the steps of the restructuring process. The underlying assumption is that the debtor and most creditors have an interest in negotiating in good faith: that is, the chapter abstracts from problems that arise because of domestic politics. Based on this assumption, the chapter describes how to resolve the remaining two problems—asymmetric information and creditor coordination. It begins with a discussion of the parties involved and then tackles the considerations that must be weighed in designing, negotiating, and concluding a debt restructuring. Case studies throughout illustrate innovations that have been employed over the years to facilitate the process.

2. The Players

A. The sovereign debtor

Sovereign debtors are unlike all other debtors on this planet (Buchheit 2013). First, a sovereign is uniquely exposed to hostile creditor legal actions. Unlike a corporate or individual debtor, there is no bankruptcy code that a sovereign

may use to restructure its debts under the supervision (and protection) of a court. A sovereign's debt can never be legally discharged in bankruptcy; debt relief can only be obtained with the creditors' consent.

Second, sovereigns are subject to suit in most national courts in respect of their commercial activities under the "restrictive" theory of sovereign immunity. Under this theory (which gained widespread acceptance in the last half of the twentieth century), when a sovereign elects to go into the international marketplace and conduct itself as a commercial actor (such as by issuing bonds), it will be accountable to judicial process as though it *were* a commercial actor (28 USC s.1602 *et seq*). However, unlike their corporate and individual debtor counterparts, sovereign assets (e.g., embassies, consulates, and military property abroad) are typically shielded from attachment by national and international law. In short, it is relatively easy for creditors to get court judgments against a defaulting sovereign but relatively difficult for creditors to enforce those judgments.

A sovereign is also unlike other debtors in that the question of *when* it has become insolvent may be subject to considerable debate. A sovereign's assets, in light of its taxing power, are theoretically congruent with all of the assets in the debtor country. The question then becomes at what point the theoretical power to tax is limited by the economic and political impracticalities of doing so. Separately, there is genuine uncertainty around a sovereign's future earning capacity, as it partly depends on exogenous and difficult-to-predict factors. Conducting a sovereign debt sustainability analysis (DSA), one of the key roles of the IMF in the debt restructuring process, is far from a precise science (Chapter 4).

Finally, sovereign debt is remarkably adhesive. The public international law doctrine known as state succession requires governments to recognize and honor debts incurred by predecessor regimes in that country no matter how different those prior administrations may be in their political philosophy and no matter what the incumbent administration thinks about how their predecessors spent the proceeds of those prior borrowings. The exceptions to this rule of public international law are very limited, an arguable one being the concept of "odious" debt (Buchheit et al. 2007).

B. State-owned entities

In the context of a sovereign debt restructuring, the debt of state-owned or state-affiliated entities may also need to be restructured, either because those credits have been explicitly guaranteed by the sovereign or because attempting

to draw a distinction between the finances of the sovereign and the related entity is essentially meaningless. Treating sub-sovereign debt may also become unavoidable. Creditors of the sovereign may insist that lenders to state-owned enterprises bear a proportional burden of the restructuring for reasons of inter-creditor equity. Restructuring a sovereign debtor's contingent liabilities (e.g., private sector debt with a sovereign guarantee that has not been called) presents its own challenges. A large contingent liability may undermine debt sustainability down the road if and when the guarantee is called (Buchheit and Gulati 2012).

C. The creditors

On the other side of the table from the sovereign are its creditors. These can broadly be divided into three categories: multilateral official, bilateral official, and commercial (private).

Multilateral official creditors and other “monitors”

Apart from the IMF, a country undergoing a debt restructuring may receive new financing from other multilateral official creditors such as the World Bank or regional development banks (e.g., the African Development Bank, the Asian Development Bank, the Inter-American Development Bank). Other national and international bodies may also monitor and support the process. In the case of the euro area debt crisis that began in 2010, for example, the European Central Bank and the European Union provided new financing and were actively involved in monitoring economic reform programs in the recipient countries. In past crises, such as the 1980s global debt crisis and the Mexican debt crisis of 1994/95, the US Treasury both provided new financing and played a key role in facilitating the debt restructuring process. Naturally, when the creditor universe comprises regulated financial institutions like commercial banks (which it did during the 1980s), the intervention of national regulators can be important (Buchheit 1990).

Bilateral official creditors

Bilateral official creditor claims traditionally take the form of loans from one sovereign state to another, often to finance exports from the creditor country or to provide development assistance. Bilateral lenders regard their credits—because they are not extended for profit but for public policy reasons, such as crisis response, official development assistance, and trade development—as senior to the commercial debts of the sovereign borrower. For their part,

commercial lenders have sometimes contested this position, arguing that bilateral credits are extended to enhance exports from, or to further the geopolitical objectives of, the lending countries.

Commercial private creditors

Commercial creditors may include bondholders, banks, suppliers, trade creditors, contractors, and even individuals. Bondholders may range from institutional investors (investment funds, insurance companies, retirement funds) who buy sovereign bonds at or near par in the primary market and hold them to maturity, to “distressed debt funds” who buy defaulted (or near-defaulted) debt on the secondary market at large discounts. Within the broad genus of distressed debt funds is a species often referred to as a “vulture” fund. Vulture investors may approach a sovereign debt restructuring with malice aforethought; they often intend from the outset to reject a negotiated settlement and to seek a preferential recovery at the sharp end of a lawsuit. Aggressive recovery strategies of this kind have sometimes significantly disrupted the orderly resolution of sovereign debts, prompting debtor countries to develop techniques to counter such behavior (discussed later in this chapter). Finally, the universe of private creditors caught up in a sovereign debt crisis may also include retail and individual creditors. Retail investors are often highly dispersed, less sophisticated than institutional investors, and less able to bear significant financial losses.

3. The Restructuring Envelope

Once the sovereign determines that a restructuring is necessary (or perhaps prior to making this determination), the sovereign should hire financial and legal advisors to guide it through the process. Because those advisors are likely to be the principal interlocutors with the country’s commercial creditors, their familiarity with the market—and the market’s familiarity with them—is critically important.

The advisors, in conjunction with the IMF, will determine the overall quantum of needed debt relief. The presence of both sets of actors helps solve the information asymmetry problem, in both directions. The IMF’s debt sustainability analysis helps to inform the creditors about the debtor’s capacity to pay. The advisors help to inform the debtor about the creditor’s willingness to accept a debt relief offer (see Box 8.1).

Box 8.1 The role of the IMF in sovereign debt restructuring

Because of its oversight and financing roles enshrined in its Articles of Agreement, the IMF is often central to the debt restructuring process (Ams et al. 2018):

Financing: The IMF provides balance of payments financing “under adequate safeguards” (e.g., conditionality) to a member country implementing an economic adjustment program. The success of that program is meant to assist the member in overcoming its balance of payments problem, enable it to repay the IMF, and foster stability more generally, including by preventing or mitigating spillovers to other countries.

The “trigger”: Whether a country requires a debt restructuring will depend on a debt sustainability analysis (DSA), the feasibility of policy adjustment and the availability of financing from all available sources. The IMF’s DSA hence plays a role in the decision whether a debt restructuring will take place (whether in the context of an IMF-supported adjustment program or outside).

The financing envelope: The IMF’s DSA also effectively identifies the envelope of resources available for debt service payments to official and private creditors, which is crucial to anchor deliberations between the debtor and its creditors.

Process: In general, the IMF encourages its members to engage in a collaborative process with their creditors when seeking a restructuring. Beyond that, the IMF leaves the specific details of the debt restructuring strategy to the debtor and its legal and financial advisors. In pre-default cases, the IMF does not insist on any particular form of dialogue between the debtor and its creditors. In post-default cases, the IMF is guided by its arrears policies, which set more specific standards for dialogue between creditors and debtors, including assessing whether the member is making a good faith effort to reach a collaborative agreement with its creditors.

Inter-creditor equity: The IMF does not intervene on issues of inter-creditor equity. Its arrears policies, however, do imply stronger protections for official creditors than for private creditors. Creditors have also accepted, in restructurings undertaken in the context of IMF-supported programs, some *intra*-group differentiation in the treatment of their claims, to help limit the extent of economic dislocation, maintain market access, and preserve financial stability.

A. Excluded claims

An important question is what categories of debt should be included in the restructuring pool. There are some general rules of thumb. First, trade credits are generally excluded or given more lenient treatment given the economic necessity of continued trade financing. Any senior or collateralized debt obligation is also generally excluded. Treasury bills, given the need for continued short-term financing of the government, are also generally left out of the restructured claims, with a few prominent examples to the contrary such as Russia (1998), Ukraine (1998), and Uruguay (2003) (Sturzenegger and Zettelmeyer 2007, 2008).

The claims of international financing institutions (IFIs) are also left out of the restructuring bucket. The IMF, for example, enjoys preferred creditor status, which means that its claims will be excluded from the restructuring process. This is a *de facto*, not a legal, priority generally recognized by all stakeholders, including official bilateral as well as private creditors. IMF financing is conditional on the member country taking steps to address its underlying economic imbalances; a process that helps to ensure that the other creditors will have their restructured claims repaid as well (IMF 2009). Other IFIs, such as the World Bank and the regional development banks, are also generally considered preferred creditors (Rieffel 2003).

B. Domestic vs. external debt

One of the biggest dilemmas facing a sovereign debtor embarking on a restructuring will be the extent to which the restructuring burden should be borne by holders of debt governed by domestic law versus holders of foreign-law governed debt. There are several considerations at play. One issue concerns the *means* of restructuring: the sovereign can unilaterally change the terms of domestic law-governed debt by making appropriate changes in its domestic law. This gives the sovereign enormous flexibility in designing the restructuring and limiting holdout behavior (see Case Study 8.4: Greece). Moreover, if domestic-law debt is denominated in local currency, the sovereign may also choose to “inflate away” the debt problem (Chapter 6).

Another set of considerations relates to the collateral effects of a debt restructuring. Restructuring local-law governed debt may be easier from a legal perspective, but because this debt may be disproportionately held by domestic residents, including local financial institutions such as domestic banks, restructuring it may undermine the health of the banking system and

worsen the prospects for restoring economic growth. Governments may also have political incentives to avoid or minimize the restructuring of domestically held debt.¹ Those claims are often held by voters or political insiders. On the other hand, focusing a restructuring exclusively on domestic debt may help to reduce the reputational costs in the eyes of the international capital markets. Countries with a strong desire to maintain access to external borrowing may therefore have an incentive to restructure domestic debt before contemplating a restructuring of debt held mainly by external creditors. One example is Russia's 1997 default and subsequent restructuring that excluded foreign law bonds issued by the Russian Federation (Sturzenegger and Zettelmeyer 2008; Reinhart and Rogoff 2009).

Restructuring foreign-law governed bonds will require other tools to limit holdout behavior (see "Carrots" and "Sticks" in Section 9 below) because the sovereign debtor cannot unilaterally change the terms of the bonds by legislative fiat, as it can with domestic-law bonds. An attempt to place the major weight of the restructuring on creditors with foreign-law governed debt, however, may give rise to inter-creditor equity concerns. Foreigners may refuse to agree to restructuring terms that effectively subsidize full payments to creditors holding domestic-law debt.

4. Preparing the Restructuring Proposals

The sovereign debtor, as the party seeking to modify the terms of its existing debt contracts, will be responsible for preparing proposals—often captioned "Indicative Restructuring Scenarios"—that lay out both the overall quantum of debt relief the sovereign will be seeking from private creditors as well as the methods (haircuts, maturity extensions, coupon adjustments, etc.) used to convey that relief. Behind the curtain, these proposals will have already been vetted by the IMF team working on the country's fiscal adjustment program to ensure consistency with the terms of that program. The release of Indicative Restructuring Scenarios is intended to serve several purposes:

- The Scenarios will psychologically prepare the creditors for the level of debt relief the sovereign will be seeking—helping to reduce "sticker shock" once a specific debt exchange offer is made.

¹ This applies with less force today than has been the case traditionally, when domestic debt was governed by domestic law, denominated in local currency, and locally held, while external debt was foreign-law governed, held abroad, and denominated in foreign currency. Today, non-resident creditors may hold domestic-law debt (denominated in either local or foreign currency), and resident creditors may hold foreign-currency denominated, foreign law debt (Gelper and Setser 2004).

- Having run the Scenarios up the proverbial flagpole, the sovereign will proceed to count the number of equally proverbial bullet holes that the documents display when they are taken down and analyzed.
- Release of the Scenarios marks the beginning of a formal negotiation process with the creditors. In the patois of the investment bankers, the Scenarios represent the debtor's "ask" in the coming negotiations.

A sovereign will have a choice in how to release its Indicative Restructuring Scenarios. If the Scenarios describe the proposed treatment of bonds or other securities, the Scenarios will constitute material non-public information (MNPI) within the meaning of the securities laws (because they signal the maximum amount of debt relief the sovereign will be requesting). Sharing the Scenarios with selected creditors or with a creditors' committee will therefore require the sovereign to obtain non-disclosure/stop-trading agreements from the institutions receiving the MNPI. The other alternative, putting the Scenarios on a public website, avoids the need for non-disclosure agreements but comes with its own risk. Once in the public domain, the Scenarios will later permit the government's critics to compare the government's opening position (as revealed in the Scenarios) with the terms of the final deal; the difference will represent the nature and extent of the government's negotiating concessions.

5. The Negotiation Process

Once a sovereign debtor concludes that a restructuring is inevitable, the challenge becomes reaching a deal with creditors. This can sometimes be relatively easy if the sovereign has a simple debt profile and a relatively homogenous creditor base (e.g., Moldova 2003, Seychelles 2010). In the context of a complex debt structure and widely diverse creditors (with banks, bondholders, hedge funds, suppliers, trade creditors, contractors, etc.) (e.g., Iraq 2005), however, arriving at an agreement on restructuring terms palatable to all creditors may be extraordinarily challenging.

A. Engagement with official sector creditors

The principal international forum for restructuring official bilateral claims is the Paris Club (G20 Leaders Declarations, 2016, 2018, and 2019), an informal group of twenty-two creditor countries that have worked together since the 1950s to find coordinated and sustainable solutions to countries' debt problems. (See Box 8.2.)

Box 8.2 The Paris Club: evolution in debt treatment

The Paris Club has concluded 433 successful negotiations with ninety countries over the last sixty years; 35 percent of them, spread over around fifty debtor countries, involved non Paris Club creditors at the time of the treatment.

From its first debt treatment in 1956 to 1987, all agreements were reached under the “Classic terms”: non-concessional reschedulings with a repayment profile negotiated on a case-by-case basis, but with no nominal debt relief. These reschedulings supported countries with IMF adjustment programs.

With the 1980s debt crisis, lower- and middle-income countries started to face deeper debt sustainability challenges. The Paris Club thus softened its terms by creating the *Venice terms*¹ in 1987, which lengthened repayment and grace periods. *Toronto terms* were created in 1988 for the most heavily indebted and poorest countries and enabled concessional treatments by providing debt cancellation for the first time. In 1990, Paris Club creditors created the *Houston terms*, designed for lower-middle-income countries, which lengthened repayment periods, allowed ODA credits to be rescheduled at a concessional rate and enabled debt swaps on a bilateral and voluntary basis for ODA claims. Considering that debt vulnerabilities were still high in 1991 for low income countries, the Paris Club replaced its Toronto terms by the *London terms* which raised debt cancellation rate from 33 percent to 50 percent.

With the adoption of increasingly concessional terms, the Paris Club recognized that the external debt situation of low-income countries had become extremely difficult and deterred future economic growth. For these countries, even full use of traditional mechanisms of rescheduling and debt reduction—together with continued provision of concessional financing and pursuit of sound economic policies—were deemed not sufficient to reach sustainable external debt.

Thus, in 1994, the Paris Club decided to treat the debt stocks of some countries by creating the *Naples terms*. For the poorest and most indebted countries, the level of cancellation was at least 50 percent and could be raised to 67 percent of eligible non-ODA credits. The rescheduling of ODA claims was further lengthened by up to forty years. The level of cancellation was again raised (up to 80 percent) for non-ODA claims with

¹ The names of the terms refer to the G7 Summit at which they were designed.

Continued

Box 8.2 *Continued*

Lyon terms in 1996. Under these terms, stock treatments were implemented for the very first time for countries having established a satisfactory track record with both the Paris Club and the IMF and for which there was sufficient confidence in their ability to respect the debt agreement.

In 1996, the international financial community realized that the external debt of a number of mostly African low-income countries had become unsustainable and launched the *Initiative for Heavily Indebted Poor Countries* (HIPC), which aimed to place the debt on a sustainable path, notably by including in debt treatments multilateral claims which had never been restructured before. In 1999, Paris Club creditors decided to reinforce the HIPC initiative to provide faster and broader debt cancellation to a large number of countries. Consequently, the Paris Club replaced its *Lyon terms* by *Cologne terms* which raised the debt cancellation rate of non-ODA claims, for countries declared eligible to the enhanced HIPC initiative, from 80 to 90 percent or more on a case-by-case basis. On top of that, all Paris Club creditors agreed to provide additional efforts to the HIPC Initiative assistance, on a bilateral basis.

Meanwhile, in 2003, Paris Club creditors agreed on a new approach, the *Evian Approach*, to deal with non-HIPC countries, providing them with more tailor-made and concessional treatments. Under this approach, a debt treatment may take various forms: flow treatment, stock reprofiling, and stock reduction (in exceptional cases). Treatments are phased to ensure that countries only fully benefit from concessional treatment if they maintain a sound track record on its IMF-supported programs over time.

Since the 2010s, and as the creditor base has become more fragmented, the Paris Club has developed an active outreach strategy to progressively expand its membership to major emerging creditors. In 2016, Brazil and Korea became full members of the Paris Club, after Israel in 2014. China, India, and South Africa have also developed working relationships with the Club under the status of “ad hoc participant.”

The Paris Club has six main principles that underlie and guide its work. These include *solidarity* (members shall act as a group); *consensus* (decisions are taken by consensus); *information sharing* (members share views and information); *case-by-case approach* (decisions will be tailored to each individual debtor); *conditionality* (in particular, the country must have an appropriate IMF-supported program), and *comparability of treatment* (The Six Principles).

The latter principle states that a debtor country that signs an agreement with its Paris Club creditors should not accept from either its private or non-Paris Club official bilateral creditors terms of debt treatment less favorable to the debtor than those agreed with the Paris Club. This means, in essence, that these creditors must use the Paris Club terms as the baseline for their own negotiations.

B. Engagement with commercial creditors

The sovereign must decide whether, and how, to engage with committees of representative creditors that may have been formed to negotiate with the sovereign on the creditors' behalf (Buchheit 2009; DeSieno 2016). This can be a surprisingly contentious issue. The presence of committees can influence restructuring outcomes in several ways.

- It should help to address the creditor coordination problem. In principle, the decisions of the committee, once made, should be accepted by all committee members and the creditors that they represent. This should be in the interests of both the debtor and creditors collectively. Creditors avoid the damage that can be created by free riders seeking a better deal at the expense of the sovereign's capacity to repay the remaining creditors. The debtor avoids the headache and legal risks of dealing with hold-outs.
- At the same time, committees may reduce the debtor's flexibility to deal with heterogeneous creditors. By "recognizing" a creditor's committee, the sovereign is implicitly agreeing that it will negotiate the terms of the debt restructuring with that body. The connotation of the word "negotiate" in this context is that the sovereign will not make a formal offer to its creditors without the prior approval of the committee. If discussions bog down, or if members of the committee insist on features that the authorities simply cannot accept (e.g., a requirement that the sovereign also restructure its multilateral debts), then the sovereign's ability to complete its debt restructuring will be blocked, possibly for a long time.
- Finally, committees may of course influence the bargaining power of creditors collectively. However, the channels through which this happens—and the net effect—are less obvious than might appear at first. Creditor committees are usually assumed to raise creditor bargaining power. In the absence of a committee, the debtor could make a take-it or leave-it offer that extracts the maximum debt relief that a broad majority of creditors are willing to accept. Negotiation by committee allows the

creditors to make counteroffers, an option not available to creditors as an uncoordinated group. However, in the presence of uncertainty, take-it or leave-it offers could also work to the benefit of the creditors. Without a formal endorsement of terms by a creditor committee, the sovereign runs the risk that its market soundings in these consultations may prove inaccurate and the restructuring offer will fail. One school of thought therefore holds that a sovereign will be under pressure to be *more* generous (to the creditors) following an informal consultation process than it would have been after a formal negotiation process with a committee.

Despite these arguments, creditor groups generally favor committees. The Institute of International Finance (IIF) has endorsed the use of committees and published best practices for their formation and operation (IIF 2016). Creditors have also advocated the incorporation of so-called “engagement clauses” in sovereign bond contracts. These are contractual commitments to recognize the formation of a creditors’ committee upon sovereign default or other signs of difficulty. Such clauses may also require the issuer to negotiate in good faith with the committee and to pay the costs of incurred by the committee (ICMA 2014). For various reasons, few sovereign issuers have included such clauses in their bond contracts (Zandstra 2016). If the IMF is providing financing to the sovereign, then the negotiation process between a sovereign and its creditors will implicate the IMF’s arrears policies. The policies are designed to encourage a sovereign to engage constructively with its creditors to reach agreement on a debt restructuring and discourage creditors from holding out of a fairly negotiated deal. (See Box 8.3).

Box 8.3 The IMF’s arrears policies

Background: The IMF’s arrears policies are rooted in legal principles that seek to avoid disruptions to the international trade and payment system. First, the Fund has recognized that incurrence of arrears undermines relationships with external creditors, which exacerbates the member’s balance of payments problems in the longer term and does damage to the international trade and payments system more broadly. Second, the arrears policies are designed to establish adequate safeguards for the temporary use of IMF resources by limiting members’ ability to achieve financing through the accumulation of arrears. Such behavior may undermine the ability of members to repay the IMF beyond the program period, as it may hinder the member’s progress in reestablishing its creditworthiness.

The IMF has recognized that these legal principles are not absolute, and its arrears policies have evolved over time to allow the IMF to lend despite a member's arrears in certain circumstances. The arrears policies make a distinction between arrears to external private sector creditors and arrears to official bilateral and multilateral creditors.

Lending Into Arrears policy for private creditors: The LIA policy (also discussed in Chapter 7) was established in 1989 in the wake of the 1980s debt crisis, after the IMF realized that its non-toleration of arrears to private sector creditors gave creditors an effective veto over IMF lending. The policy, as amended over time, allows the IMF to lend to a sovereign with arrears to external private creditors, only if the member is making a “good faith effort” to reach a collaborative agreement with its private creditors. While the policy does not outline exactly what type of behavior constitutes “good faith,” it does set expectations about the extent of the dialogue between the debtor and its creditors (IMF 2013).

Official arrears policies: The negotiations between a debtor and its official bilateral creditors take place in the shadow of the IMF's official arrears policies. The IMF traditionally had a strict policy of non-toleration of unresolved arrears to official bilateral creditors. In light of changes in the official creditor landscape—whereby the majority of official sector financing is now provided by non-Paris Club creditors—the policy was amended in 2015 to allow the IMF to lend into unresolved official arrears that will be restructured in the context of an IMF-supported program when *any* of the following criteria are met: (i) the creditors consent; (ii) there is a representative Paris Club agreed minute; (iii) if there is no representative Paris Club agreed minute, the debtor is negotiating in good faith with the creditor to resolve the arrears and the IMF's decision to provide financing despite the arrears would not have an undue negative effect on its ability to provide financing in the future (IMF 2015c).

Official bilateral creditors covered by the anticipated terms of the Paris Club's agreed minute are deemed resolved for Fund program purposes. Relying on the Paris Club's comparability of treatment principle, the Fund deems that non-Paris Club official bilateral creditors will restructure the member's debt on similar terms as the Paris Club creditors. Moreover, arrears that will not be restructured in the context of an IMF-supported program are not tolerated, and the IMF will only lend into such arrears if the member does not object to the IMF lending, despite the arrears. Generally, arrears to multilateral creditors must be cleared during the program period, while arrears to the World Bank must be cleared up front (IMF 2013).

6. Creditor Objectives and Constraints

Commercial creditors typically approach a sovereign debt workout with the following objectives and constraints:

- (i) If a class of creditors (like trade creditors or Treasury bill holders) can talk their way out of participating in a debt restructuring that is, for them, the best option, but will be proportionally bad for all the other creditors. A debt restructuring is a zero-sum game. The sovereign will need a certain level of debt relief. If one creditor or class of creditors is exempted from the process, the other creditors will have to make additional contributions to cover the shortfall. Accordingly, the basic rule for a creditor is this—if you can jolly your way out of a debt restructuring, great; but if you can't, then do all in your power to ensure that as many other creditors as possible are also roped into the process.
- (ii) The basic logic of a debt restructuring for the creditors is simple—accept some degree of debt relief in order to enhance the collectability of the balance of the exposure. That logic, however, requires a judgment about how much debt relief will be required, in combination with fiscal adjustment and official sector support, to return the sovereign to a sustainable position. This is usually where the IMF comes in. The creditors will look to the Fund to vouchsafe (implicitly) that the amount of debt relief being requested from them is sufficient to achieve sustainability but not more than is necessary to reach that point.
- (iii) Creditors watch each other warily. No creditor wants to be embarrassed by giving more debt relief than other similarly-situated creditors. This instinct inexorably leads to calls for measures designed to assure parity of treatment among different types of creditors (Buchheit 2002). (See below, “Parity of treatment undertakings” in Section 9.)
- (iv) Finally, once debt relief has been given, the creditors will want to do everything they can to prevent the sovereign debtor from backsliding. An IMF program may help to enforce fiscal discipline, but only for a while. Over the longer term the creditors will need to look to contractual protections (such as financial covenants and events of default) to impose behavioral discipline on their sovereign borrowers. In truth, however, these are crude and frequently ineffective tools.

7. Methods and Techniques

Open the toolbox of a sovereign debt restructurer and you are likely to find three main tools:

- change the maturity dates for amounts of principal or interest falling due under the affected debts and introduce grace periods,
- reduce the principal amount of the debt (in the jargon, a principal “haircut”), and
- reduce the interest rate on the debt (in the case of bond indebtedness, a “coupon adjustment”).²

It is possible, of course, to mix and match these techniques (for example, a maturity extension with a coupon adjustment) and this is indeed the norm in most sovereign debt restructuring packages.

For their part, creditors can be expected to express strong views about the method chosen to address a sovereign’s debt problem. Principal haircuts are particularly disfavored by commercial creditors. When the restructuring involves only a maturity extension and/or a coupon adjustment, a post-closing improvement in the sovereign’s financial prospects and credit rating will directly benefit creditors because the secondary market value of the *entire* principal amount of their claims against the country will increase. Principal haircuts, however, involve a forfeiture by the creditor of a portion of that claim. A subsequent improvement in the credit rating of the country can therefore lift the value only of the residual principal amount of the claim. This explains why transactions calling for principal haircuts are more likely to involve the issuance of some form of “value recovery instrument” (see Section 9) that will permit creditors to recoup a portion of their loss if the economic fortunes of the sovereign debtor improve in the future.

² Other techniques for achieving debt relief are sometimes possible. For example, when the sovereign’s debt obligations are trading at a significant discount to face value in the market, the sovereign borrower—if it has a funding source—may attempt to repurchase the instruments and thus benefit from that discount. This was the method employed by a number of HIPC countries to reduce their commercial debts. Funding for those HIPC buybacks came from official sector grants. As pointed out by Bulow and Rogoff (1988), debt buybacks may not be effective—in the sense of benefiting mainly the creditors rather than the debtor—if they occur at secondary market prices, as debt prices will generally rise in response to the buyback. However, some sovereign debtors have attempted buybacks at prices fixed by the debtor, using some of the methods in Section 9 below to induce creditors to buy at that price.

One restructuring technique that has received recent attention involves a “reprofiling” of maturities (that is, a relatively short extension of the maturity dates of affected debt instruments), often with interest rates left untouched during the extension period (Buchheit et al. 2015). The classic example is Uruguay’s debt restructuring of 2003. Uruguay extended the maturity date of each of its eighteen bonds issued in the international markets by a uniform five years, while leaving the coupon rates during this extension period the same as those on the bonds as originally issued (Buchheit and Pam 2004). In 2016, the IMF endorsed the use of a reprofiling technique in situations where the Fund is providing exceptional access to its financing, and cannot assess the sovereign’s debt to be sustainable with a high probability (IMF 2014a, 2015a and Chapter 7). The reprofiling shifts the maturities of existing debts out of the IMF’s program period, thus obviating the need to fund those maturities with official sector resources.

8. The Holdout Creditor

For the vast majority of private sector creditors affected by a sovereign’s financial distress, accepting a restructuring of their claims is the only practicable solution. The sovereign debtor will lack the resources to pay all of its debts on their original terms; that’s pretty much the definition of financial distress. Turning all or any significant part of those claims into court judgments does not alter this hard fact. The sovereign will not have the money to pay all claims in full regardless of whether the claimants transform themselves from simple creditors into judgment creditors.

But what is inescapable for most creditors—a negotiated, consensual workout—can be an attractive business opportunity for the few or the one lender who is prepared to break ranks with fellow creditors. The theory is simple. If the sovereign debtor receives debt relief from most of its lenders, this will increase the likelihood that the sovereign will have the money to pay off an importunate maverick creditor that declines to join the restructuring and threatens to pursue legal remedies. In the jargon of sovereign debt restructuring, these maverick creditors are “hold-outs” from the main restructuring exercise.

There is a popular belief that hold-out creditors attempt to delay or derail sovereign debt restructurings. They don’t. Indeed, the hold-out creditor prospers only if all or most of its fellow creditors agree to provide debt relief to the sovereign; the more debt relief the better from the standpoint of the hold-out.

If the hold-out population in a sovereign debt restructuring is of any significant size, the financial predicates behind the entire exercise are undermined and the hold-out's prospects of extracting a preferential recovery diminish. By their very nature hold-outs are individualistic and do not regulate themselves as a group. Even if hold-outs do not derail a debt restructuring, they can cause considerable mischief after it closes. The sovereign debtor's job is therefore to employ some combination of carrots and sticks (discussed below) in order to reduce the size of any hold-out population in a debt restructuring and to neutralize, to the extent possible, the extent of any post-closing mischief.

The relationship of hold-outs to those creditors who elect to join a sovereign debt restructuring has altered over the years. Once upon a time, the investor community welcomed, or at least tolerated, the threat of hold-out creditors in a sovereign debt workout. The prospect of litigious hold-outs, the argument went, would induce the sovereign debtor to offer more generous financial terms to all of its creditors in an attempt to narrow or eliminate the hold-out class. Hold-outs, although perhaps insufficiently infused with fraternal creditor spirit, were none the less the pebble in the shoe, the burr in the saddle, the bee in the bonnet—choose your idiom—that kept sovereign debtors from demanding excessive amounts of debt relief from the creditor class as a whole.

Those days are over. The perception of hold-outs as benign spurs to sovereign debtor restraint ended in 2012 in the context of the Argentine saga. In that year, some of the hold-outs from the Argentine debt restructuring of 2005 sought and obtained an injunction from a US federal court effectively preventing Argentina from making payments on the new bonds it had issued in that restructuring to participating creditors unless it was prepared to pay in full the litigious hold-outs (*NML v Argentina*). The hold-outs had thus turned on their fellow lenders. Not only were the hold-outs demanding a preferential recovery indirectly funded by the generosity of their quondam fellow creditors, they were now forcing the debtor to default on those indulgent creditors unless the hold-outs were paid off in full. Post-Argentina, the suppression of hold-out creditor behavior has therefore become an imperative not only for sovereign debtors but also for the vast majority of their other lenders (Buchheit and Gulati 2017b; Buchheit 2018b).

Some restructurings will include minimum participation thresholds (e.g., 90 percent) and will go forward only if such participation thresholds are reached. In any event, if a debt restructuring ends without full participation by the affected creditors, but is still determined viable, the sovereign will need to decide how it will treat the non-participants. A very small number of

hold-outs may allow the sovereign to pay them according to the original terms of their debt instruments (Ecuador 2000; Greece 2012). A more-than-trivial hold-out population, however, probably portends a disagreeable bout of litigation with hold-outs, as the case of Argentina in the aftermath of its 2001 default illustrates.

9. Encouraging Creditor Participation

Sovereign debtors sometimes attempt to cajole their lenders into granting debt relief, sometimes they bludgeon them into doing so, and occasionally they try to do both at the same time (Buchheit and Daly 2014).

A. Carrots

Cajoling usually involves adding sweeteners to the restructuring package to entice widespread creditor participation. Naturally, these sweeteners can operate only at the margin. By its very nature a sovereign debt restructuring will be distasteful for the lenders caught up in the exercise.

Cash (or cash equivalents)

The transaction sweetener with the highest saccharine content will be cash or a cash equivalent like high-quality short-term debt obligations of a third party. Cash can be used to pay down outstanding principal, to reimburse accrued but unpaid interest or to pay “participation fees” to the creditors joining the restructuring. The problem, of course, will be funding. The one commodity that will be in short supply for a country embarking on a restructuring of its external debt is foreign currency. There have been cases (Greece in 2012 is the most recent example) where official sector sources have been prepared to lend a sovereign debtor the cash (or cash equivalent) needed to sweeten its offer to commercial creditors (Zettelmeyer et al. 2013).

Value recovery instruments

Lenders may argue that they are being asked to defer or reduce their claims when the country is at the nadir of its economic fortunes. What happens, however, if the economy of the debtor country improves in the future? Isn't it fair, the creditors will ask, that they recoup some portion of the financial sacrifice they will have endured in the debt restructuring to make that future prosperity possible?

This sentiment has led to the inclusion in the financial packages offered to private creditors in a number of sovereign debt restructurings of what are generically called “value recovery instruments” or “VRIs.” VRIs most prominently made their appearance during the Brady era, when commercial banks were asked to accept haircuts on their long-outstanding sovereign loans.³ In the Brady packages for oil exporting countries like Mexico, Venezuela, and Nigeria, participating creditors were offered warrants linked to the price of oil. The theory was that if the price of oil in the future exceeded an inflation-adjusted benchmark price, this would be a fair proxy for concluding that a degree of prosperity had returned to the debtor country. In that situation, the argument went, it would only be fair that the sovereign begin making payments on warrants issued at the time of the restructuring.

In countries that did not rely on the export of a single commodity like oil for a significant portion of foreign currency earnings, creditors occasionally insisted on receiving an instrument (or a feature) linked to the debtor country’s future Gross Domestic Product. Costa Rica included such a feature in its commercial bank debt restructuring in 1989. If Costa Rica’s GDP in any future year (subject to caps and a sunset provision) exceeded 120 percent of the 1989 level of GDP in real terms, additional payments would be due on the restructured debt. Uruguay in its Brady deal of 1991 issued instruments that paid off if the benchmark price of a basket of Uruguayan commodity exports (deflated by the price of oil—an import) exceeded a target level. Other countries that incorporated a GDP-linked instrument or feature in their debt restructuring packages were Bulgaria (1994), Bosnia and Herzegovina (1997), Argentina (2005/2010), Greece (2012), and Ukraine (2015) (IMF 2017).

The economics literature on sovereign debt is not entirely clear on whether insisting on value recovery is a good idea. Apart from restoring the country to solvency, one idea that should influence the extent and design of a debt restructuring is the removal of “debt overhang,” which causes an economy to grow more slowly than it otherwise would (Obstfeld and Rogoff 1996). Debt overhang arises when debt is so high that the debtor must deliver a large share of its resources to its creditors even in a relatively good overall economic climate. This undermines incentives to invest. Writing down debt restores this incentive. Value recovery instruments could undermine this effect if they disproportionately raise repayments in good states. That said, observed value recovery instruments are either indexed to commodity prices—which are

³ During the Brady era, named after then US Treasury Secretary Nicholas Brady, countries exchanged their commercial bank loans for bonds backed by US Treasury bonds, after commercial banks granted debt relief.

insensitive to government and private investment—or simply not important enough to reduce the government’s inherent incentive to grow the economy. Furthermore, GDP-linked instruments do of course have the advantage that they reduce fiscal pressure in a downturn, which may support growth.

Loss reinstatement features

One of the perennial worries in sovereign debt workouts, for both official and commercial lenders, is the problem of the backsliding sovereign. What happens if, once the debt restructuring is completed, the sovereign borrower reverts to the behavior and policies that landed the country in a debt crisis in the first place? Moreover, all sovereign debt restructurings are premised on an unspoken covenant. The creditors grant debt relief on the assumption that the sovereign will perform its obligations on the new terms embodied in the debt restructuring. If the sovereign breaches its side of that covenant by defaulting again on its restructured debt, should not the lenders be restored to their positions status quo ante the restructuring?

One technique for commercial lenders to address this concern is called a “principal reinstatement” feature. It provides that if a debtor country seeks another round of restructuring of the same debts in the future, some or all of the principal amount forgiven in the first round will balloon back, thus allowing the lenders to come to the negotiating table in the second round with their original claim unimpaired. Ecuador first used this technique in its debt restructuring in 2000. Belize included a principal reinstatement feature in its 2013 restructuring. A similar concept was used by the Seychelles (2010) and by St Kitts and Nevis (2012), although in those cases the restoration of principal would have been triggered by a failure of the debtor country to implement its IMF program.

Parity of treatment undertakings

Lenders don’t like to look foolish. And nothing makes them look more foolish than getting caught granting a sovereign borrower significant debt relief while other, similarly situated, lenders avoid doing likewise. This paints the participating institutions as gullible, incompetent patsies. In extreme cases, some lenders may refuse to participate in a debt restructuring unless this risk can be addressed.

The architects of a sovereign debt workout may attempt to reduce the lenders’ anxiety by including in a restructuring package a covenant promising that other lenders will not be given preferential treatment (Buchheit 2002). The most famous example of such a provision, discussed above in the section on engagement with official sector creditors, is the “comparable treatment”

clause in a Paris Club Agreed Minute. A more notorious version of a parity of treatment clause in a restructuring of commercial debt is Argentina's 2005 Rights Upon Future Offerings (RUFO) clause, which stated that if Argentina voluntarily made a better offer to creditors within a certain time period, other creditors had a right to the same treatment.

Unlike the Paris Club "comparable treatment" approach, which prohibits offering sweeter deals to other creditors, commercial lenders word these clauses as a covenant to give participating lenders the benefit of any sweeter deal that may be offered down the road to hold-outs. This difference in approach reflects two different underlying visions:

- Commercial lenders are driven by a fear of legal liability. They worry that forcing a borrower to promise that it will not pay other lenders on preferential terms might be portrayed as a tortious interference with the borrower's contracts with those other lenders.
- The Paris Club approach is driven by long-term balance of payment considerations: it aims at ensuring that the debt restructuring it provides is in line with the framework identified by the IMF to fill in the financing gap of the debtor country, and that it will not lead to more payments to other creditors instead of restoring the financial situation of the debtor country.

One example of a clause designed to ensure that no private creditor receives better treatment for its share of the loan than that enjoyed by other private creditors was the "sharing clause" of the 1980s, which required any bank that received a disproportionate payment of its loan to share those funds with all other banks. A disadvantage of this type of clause is that it curtails not only the ability of creditors to cut a better deal with the sovereign than that agreed with the majority (its intended effect) but can also inhibit the sovereign in negotiating further debt relief arrangements with willing lenders in the future. Case Study 8.1: Mexico describes how this problem was addressed in Mexico's 1987 restructuring.

Case Study 8.1 Mexico 1987

Innovation—debt-for-debt exchange clauses

The sovereign debt restructuring agreements of the 1980s were hugely centripetal. They forced the commercial banks that had originally lent to a sovereign borrower individually or as part of a syndicated loan into massive restructuring agreements to which hundreds of banks might be parties.

Continued

Case Study 8.1 *Continued*

The smaller banks and the regional banks, however, were wary of this forced togetherness. They feared that in a pinch their larger bank colleagues—those enjoying close relationships with the sovereign debtors—might find a way to get themselves paid while leaving the little guys behind. To assuage these concerns, the restructuring agreements contained a battery of clauses designed for one purpose—to ensure that no bank could receive better treatment for its share of the loan than that enjoyed by all the other banks. A good example was the sharing clause. This provision required any bank that received a disproportionate payment of its loan to share those funds ratably with all the other lenders.

By the end of the decade of the 1980s, however, these contractual provisions requiring equal treatment of all banks began to inhibit the ability of sovereign borrowers to negotiate debt relief arrangements with willing lenders. A lender could not, for example, offer to write off a portion of its loan in return for the pledge of collateral security for the balance.

In 1987, Mexico secured the consent of its Bank Advisory Committee to include in the country's debt restructuring agreements a seemingly innocuous clause permitting qualified debt-for-debt exchanges. As drafted, this clause permitted the debtor to exchange any bank's interest in the restructured loan for a new debt instrument as long as the average weighted life of the new instrument was greater than the average weighted life of the debt it was replacing. Importantly, the clause was explicit in severing the sharing clause and negative pledge clause links between the new instrument and the old restructuring agreement.

Debt-for-debt exchange provisions quickly found their way into the restructuring agreements of other countries like the Philippines and Venezuela. They proved to be the most significant legal innovation of the late 1980s. Debt-for-debt exchange clauses paved the road for the introduction of the Brady Plan in 1989 (which ended the Latin American debt crisis starting in 1990).

Credit enhancement

The present value of bonds issued in a sovereign debt restructuring (the “new bonds”) will be enhanced if the sovereign debtor can persuade a creditworthy third party to issue a partial guarantee of amounts due under the bonds or if

the sovereign can post collateral security for the new bonds. An example of the former technique is Seychelles' 2010 debt restructuring in which the country's new bonds benefited from a partial guarantee issued by the African Development Bank. The most prominent examples of sovereign bonds that benefited from collateral security are the Brady bonds issued in the 1990s. The principal of most Brady bonds was secured by the pledge of US Treasury zero-coupon obligations (or an equivalent high-grade issuer) and some also benefited from the pledge of cash collateral to achieve a rolling partial interest guarantee.

Contractual improvements

A sovereign looking to encourage private creditor participation in a debt restructuring may be able to offer its lenders a sweetener in the form of an upgrade in contractual terms. If the original debt instruments that the sovereign is attempting to restructure have less-than-fully-robust legal protections for the holder (such as a choice of the sovereign's own law as the governing law of the instrument; submission to the jurisdiction of local courts; the absence of cross-default protections; etc.), these infirmities may be corrected in the new instruments issued in the restructuring.

The most visible recent example of such an upgrade occurred as part of the Greek debt restructuring of 2012. Most of the bonds affected by that restructuring were governed by Greek law, a feature that facilitated their restructuring with the help of a legislatively-imposed "class voting mechanism" that allowed a majority of creditors to bind the minority to the restructuring (see Case Study 8.4: Greece 2012). As part of the restructuring, however, the Greek Government offered participating holders new bonds governed by English law (and thus not subject to the fiat of the Greek parliament).

A much earlier example was the Russian "Prins/IANs" bond exchange of 2000. Unlike Greece, this transaction involved no upgrade in governing law (both old and new bonds were governed by English law). The old instruments, however, were bonds issued by a state-owned bank, Vnesheconombank, while the new instruments were Eurobonds of the Russian Federation enjoying all of the contractual features of bonds targeted to international markets (including expanded cross-acceleration clauses, see Case Study 8.2). Eurobonds of this type had been issued by Russia since 1996 and constituted the only class of Russian Federation debt instruments that had survived Russia's 1998–2000 default unscathed. The Russian authorities were therefore offering creditors a type of debt instrument that had never been tainted by default, suggesting that the authorities would have reasons to keep it default-free in the future (as has indeed been the case).

Case Study 8.2 Russia 2000

Innovation—contractual improvements

Following the collapse of the Soviet Union in 1992, Vnesheconombank (VEB)—the agency responsible for the USSR’s international trade and financial relations—defaulted on foreign currency loans from Western banks. After several years of negotiation and partial payments, the Russian Federation, as the Soviet Union’s legal successor, reached a restructuring agreement by which the banks’ Soviet era claims were exchanged for a bundle of “Principal Bonds” (Prins), “Interest Arrears Notes” (IANs) and some cash. Prins and IANs remained foreign currency obligations of VEB (*without* an explicit guarantee of the Russian Federation).

That 1997 settlement was short-lived, however. Following the August 1998 Russian currency crisis, VEB missed payments on Prins in December 1998 and subsequently on both Prins and IANs. This triggered a new round of negotiation between Russia and its Bank Advisory Committee which led to the exchange, in August of 2000, of Prins and IANs for a set of new Eurobonds issued by the Russian Federation. One wag on the Russian negotiating team dubbed those new bonds “The Instruments Formerly Known as Prins.” The new bonds involved significant reductions in both face value and present value, which made this the harshest post-Brady debt restructuring at the time (Santos 2003; Sturzenegger and Zettelmeyer 2007; Gorbunov 2010).

At the same time however, creditors received a set of Russian Federation Eurobonds that Russia had continued to service throughout the 1998–99 crisis, and whose contractual features arguably made them much safer than Prins and IANs. This included an upgrade in the obligor (now the sovereign directly, rather than VEB), as well as cross-acceleration clauses that implied that default on the new bonds would trigger default on any future issues of Russian Federation Eurobonds (and vice versa). As a result, the exchange attracted a very high participation rate (about 99 percent), in spite of the high haircut.

The technique of upgrading the legal characteristics of a debt contract to induce creditors to accept a restructuring offer was an essential feature of the Brady bond exchanges in the early 1990s. In all but two cases, the limited amount of bonds that had been issued by emerging market countries undergoing debt restructurings in the 1980s had continued to be serviced normally

despite concurrent restructurings of bank loans, bilateral credits, trade lines, and interbank deposits. For a time at least (lasting until the late 1990s), sovereign bonds enjoyed a halo that suggested (but did not promise) an exemption from future debt restructurings. As a condition to giving the debt relief required by the Brady Plan, the commercial bank lenders of that era therefore demanded a switch from their syndicated loans—which had been serially restructured over the prior decade—into new bonds, immediately dubbed “Brady bonds.”

B. Sticks

Carrots, even juicy ones, can only go so far in enticing a deeply-dyed hold-out to join a debt restructuring. Sovereigns also have more coercive tools in their arsenal to persuade otherwise unwilling creditors to join a deal. Most of these “sticks” are designed to resolve the collective action problems inherent in a debt restructuring process that must be undertaken in the absence of a formal bankruptcy code. Collective action problems can arise when the majority of creditors conclude that it is in their best interest to agree to a restructuring proposal, but a few maverick lenders want to hold out in the hope of realizing a preferential recovery. If the perceived hold-out risk is significant, creditors who would otherwise have agreed to participate in a restructuring may be unwilling to do so for inter-creditor equity and fiduciary liability reasons. Full payment of hold-out creditors—if the aggregate size of their claims is significant—can also reduce the sovereign’s available resources to pay its restructured creditors. That will be salty insult added to the previous injury of the debt restructuring.

Implicit or explicit threats of nonpayment

Behind every sovereign debt restructuring will be a threat, implicit or explicit, that hold-out creditors will not be paid, or at least not paid anytime soon. Normally, this is done obliquely. A sentence along these lines is likely to appear in the disclosure document for the restructuring:

Regrettably, the Republic of Ruritania does not now foresee the circumstances in which it will have the financial resources to pay in full any eligible claims that are not tendered in this restructuring.

Some sovereigns, however, dispense with subtlety and deliver the message bluntly. The most famous example of this occurred in the Argentine bond restructuring of 2005. The Argentine government went so far as to pass a law

(the “Lock Law”) forbidding any payment or settlement with hold-out creditors and the related disclosure document warned bondholders to abandon hope if they did *not* enter here (the debt restructuring).

Threats of nonpayment can be a powerful tool to achieve full (or near-full participation) in a debt exchange, provided it is combined with an exchange offer that is considered sufficiently attractive relative to the prospects of holding out (Bi et al. 2016). Furthermore, debtors should be careful to avoid Lock Law-style legislative enactments that might allow a hold-out to successfully argue, in a New York or English court, that the debtor is in breach of a *pari passu* provision prohibiting the subordination of bonds held by the holdout (Buchheit 2018b).

Collective action clauses

Perhaps the most common tool for dealing with hold-out creditors in sovereign bonds is the use of collective action clauses (“CACs”) (Gelpern and Gulati 2013). CACs, long a feature of bonds governed by English law, first made their appearance in sovereign bonds governed by New York law in the early 2000s after endorsement by the official sector (IMF 2002). These “series-by-series” CACs enabled a qualified majority of bondholders of a specific bond issuance (typically 75 percent) to bind the minority *of the same issuance* to the terms of a restructuring.

While these first-generation “series-by-series” CACs were useful, they risked the possibility that a creditor, or a group of creditors, could obtain a blocking voting position in a particular series and thus nullify the operation of the CAC in that series. The vulnerability of first-generation CACs to hold-out creditors was shown in the Greek restructuring of 2012. Hold-outs obtained a blocking position in about half of Greece’s foreign-law governed bond series, thereby frustrating the operation of CACs.

Recognizing the limitations of series-by-series CACs, a few international sovereign bond issues provide for a limited form of aggregation in the form of “two-limb” CACs (see Case Study 8.3: Uruguay).

These second-generation two-limb aggregated CACs still allow hold-outs to control an issue, albeit with greater effort and cost. While the required 66⅔ percent threshold for each individual series under the aggregation clauses is easier to achieve than the typical 75 percent threshold under series-by-series CACs, creditors may still obtain a blocking position with respect to a particular series. In such cases, the particular hold-out series would be excluded from the restructuring, while the restructuring would still be carried out for other series so long as the two-limb voting thresholds are met.

Case Study 8.3 Uruguay 2003

Innovation—aggregated collective action clause

At the strong urging of the G-10 countries, collective action clauses were introduced into sovereign bonds governed by New York law starting with a United Mexican States bond issued in February 2003. Mexico used a conventional form of CAC that operated only within the four corners of the bond containing the clause. In a debt restructuring involving multiple series of bonds containing such clauses, a separate CAC vote would be needed for each series. This was a weakness of traditional CACs—it can be relatively easy for hold-out creditors to amass a 25 percent blocking position in a single series.

Four months after the Mexican issue, Uruguay restructured its international bonds in May 2003 and incorporated an “aggregated” CAC in the new instruments. The aggregated CAC permitted *all* holders of *all* series to vote together on a proposed restructuring, while also preserving a vote in each series, albeit with a lower voting threshold (66⅔ percent rather than 75 percent, providing that 85 percent of all affected series approved the exchange). This made it more difficult for a hold-out creditor to accumulate a blocking position. The Uruguay clause became the model for so-called “two-limb” aggregated CACs such as those adopted ten years later by members of the European Monetary Union for use in all euro area sovereign bonds issued after January 1, 2013.

In 2014, the international community endorsed the use of a menu of alternative voting procedures, including a third-generation style CAC: single-limb aggregated CACs (ICMA 2014; Sobel 2016). These CACs are now the standard market practice for bonds issued under New York and English law. Single-limb CACs have the benefit of requiring only a single vote calculated on an aggregated basis across all affected bonds. By eliminating the requirement of a series-by-series vote (i.e., the second limb), a single-limb voting procedure removes the possibility of obtaining a controlling position within a particular issuance to block the restructuring of that issuance. While almost 90 percent of international sovereign bonds issuances issued after 2014 have included single-limb aggregated CACs, a large stock of international sovereign bonds does not have them. At this time, euro area sovereigns, for their part, are required by the European Stability Mechanism (ESM) treaty to include two-limb

aggregated “euro CACs.” However, the Eurogroup announced in December 2018 broad support amongst euro area finance ministers to amend the ESM treaty to require single-limb CACs in all euro area issuances by 2022. Despite the advancements in CACs, there continue to be calls for statutory solutions to resolve sovereign debt defaults, building on the IMF’s Sovereign Debt Restructuring Mechanism proposal of the early 2000s (see Chapter 9; Hagan 2005; Buchheit et al. 2013).

Exploiting the local law advantage

Suppose a country wishes to restructure debt issued under its own law. This opens up the possibility of the ultimate stick—threatening to change the local law to facilitate the debt restructuring. As long as such legislative changes pass muster under the country’s constitution (particularly constitutional protections for property rights), and possible international agreements signed by the issuer, they should be valid. A change in local law is a risk that investors take when they buy local-law governed debt instruments.

For this reason, emerging market bonds targeted to foreign investors have generally been issued under foreign law, making the use of the local-law advantage moot in external debt restructurings. Furthermore, even when foreign investors purchased local-law debt in domestic financial markets, as was the case for the famous Russian short-term zero-coupon government bonds known as GKO in 1996 and 1997, subsequent restructurings did not use the local-law advantage, largely because local-law instruments tended to be issued in domestic currency, making it easy to expropriate foreign holders through other means such as devaluation, inflation, or capital controls.

Recently, however, there has been an important exception—sovereign debt instruments issued by euro area governments. Developed countries tend to issue most sovereign debt under local law, perhaps because investors trust the government not to exploit this feature to their advantage. At the same time, however, euro area sovereign debt is “foreign currency denominated” in the sense that the issuing country has no unilateral control over euro area monetary policy.

As a result, the use of the local-law advantage could have practical implications in euro area debt restructurings and was in fact prominently used in the only major debt restructuring in the euro area so far: Greece in 2012. It was arguably the main reason why the Greek restructuring succeeded in achieving both a large haircut and a high participation rate (Zettelmeyer et al. 2013). Importantly, this success relied on the fact that the local-law advantage was *not* used to change directly the payment terms of the bond being restructured—which may have been illegal under the Greek constitution and/or the European

Charter of Human Rights—but rather to “retrofit” a class voting mechanism equivalent to a single-limb aggregated CAC, making it much easier to deter potential hold-outs (8.4 Study: Greece 2012).

In principle, the same procedure could be used in future euro area debt restructurings. However, euro area governments have, since 2013, issued bonds that include a form of aggregate collective action clause, making it harder to argue that dealing with hold-outs justifies a class voting mechanism that is legislated ex-post (Grund 2017; Buchheit and Gulati 2018).

Case Study 8.4 Greece 2012

Innovation—retrofit class voting mechanism

In 2012, the Hellenic Republic faced the daunting task of restructuring more than €200 billion of Greek government bonds in the hands of private investors. To comply with its undertakings to its official sector sponsors (the European Union and the IMF), Greece needed to inflict at least a 50 percent principal haircut on those bonds, achieve a creditor participation rate exceeding 90 percent in the restructuring, and complete the entire exercise within five months. A tall order, by anyone’s reckoning.

But Greece had an advantage that no emerging market country has enjoyed in a previous sovereign debt restructuring. More than 90 percent of the Greek government bonds subject to the restructuring were governed by Greek law (rather than a foreign legal system such as the law of England or the law of the State of New York). This gave the Greek parliament the ability to enact domestic legislation to facilitate the coming debt restructuring. The question was how to use that local-law advantage in a manner that would be acceptable, as a matter of policy and precedent, to Greece’s official sector sponsors and would survive the inevitable legal challenges.

The solution took the form of domestic legislation that effectively corralled all of the holders of Greek law-governed bonds into a single class for the purposes of voting on the eventual debt restructuring proposal. If holders of two-thirds (by value) of those instruments voted to accept the restructuring, that decision bound all members of the class. The Greek parliament’s action thus replicated—for the sovereign’s own bonds—the class voting mechanism typically found in corporate insolvency regimes. Using this mechanism, all of Greece’s eligible local law debt stock was successfully restructured in March 2012.

Exit consents

Another way to discourage potential hold-out creditors is through the use of a technique called exit consents. It works as follows: all holders of the old bond are invited to exchange it for a new bond reflecting the terms of the restructuring. When agreeing to tender the old bond in exchange for the new bond, the holders are asked to consent to modification of the old bond that would make it less attractive to prospective hold-out creditors. Exit consent modifications may not amend any provisions of the bond that require unanimous consent (such as payment terms), but theoretically any other provision of the bond is fair game for a simple majority amendment. So, for example, an exit consent might be used to eliminate the requirement that the old bonds remain listed on a stock exchange, delete the *pari passu* clause, remove the acceleration remedy or repeal one of more events of default.

Exit consents in sovereign bond restructurings were first used in Ecuador's bond exchange in 2000, and in a streamlined form in Uruguay's 2003 restructuring (Buchheit 2000; Buchheit and Pam 2004; Buchheit and Gulati 2017a). Since the introduction of CACs in bonds governed by New York law, however, the utility of the exit consent technique has diminished. Virtually any change to a material term of the bond will now be governed by the CAC.

Trust structures

Issuers may reduce the threat of hold-outs in the event of a restructuring by issuing bonds under a trust structure. Trust structures reduce the hold-out threat by centralizing enforcement powers in the hands of the trustee. Trust structures may also have the benefit of shielding funds paid as debt service from attachment by creditors (Buchheit 2018a). International sovereign bonds are typically issued under either fiscal agency agreements (FAAs) or trust structures. Under an FAA, the fiscal agent serves as an agent of the issuer, and its main responsibility is the making of principal and interest payments to the bondholders. Under trust structures ("trust indenture" under New York law or "trust deed" under English law), a bond trustee acts on behalf of, and has responsibilities to, bondholders as a group. Historically, international sovereign bonds governed by New York and English laws tended to be issued under FAAs; as FAAs are marginally cheaper and easier to implement than trust structures. However, in recent years, the use of trust structures has increased in New York-law governed bonds (IMF 2015b).

Protection of assets

As noted at the beginning of the chapter, in most countries—the United States and the UK included—sovereign assets enjoy significant protection from seizure by judgment creditors. This protection normally does not, however, extend to any assets that are used in commercial activity. For example, the proceeds of commodity sales by a sovereign—or a state-owned enterprise—are likely to be considered proceeds of the sovereign arising from commercial activity, and subject to attachment. Apart from legal immunities, countries faced with the prospect of litigious creditors sometimes take practical steps—such as redirecting payment flows or changing ownership structures—that are intended to shield vulnerable assets from attachment. One of the most extreme asset protection mechanisms was put in place during the Iraq restructuring, when the UN Security Council passed a resolution to immunize cash proceeds from Iraqi oil sales from attachment in all UN member states (Case Study 8.5: Iraq).

Case Study 8.5 Iraq 2005–2008

Innovation—immunization of assets from seizure

In the spring of 2003, Iraq's outstanding sovereign debt stock, inherited from the previous regime, exceeded \$140 billion and was owed to an astonishing diversity of creditors—other governments, banks, construction companies, and trade creditors of many kinds. Iraq derived virtually all of its foreign currency earnings from the sale of oil. Creditors could therefore have strangled Iraq's economic recovery by attaching Iraqi oil shipments in the international markets and seizing the cash proceeds from the sale of that oil.

The solution took the form of a UN Security Council resolution—Resolution 1483 of May 22, 2003—that encouraged a prompt restructuring of Iraq's debt and immunized all Iraqi oil sales, as well as the cash proceeds from the sale of that oil, from “any form of attachment, garnishment, or execution.” All member states of the United Nations had to incorporate these immunities for Iraqi assets into their domestic law. Resolution 1483 was taken under Chapter VII of the UN Charter and thus was binding on all member states. The legal immunities for Iraqi assets provided by Resolution 1483 lasted until 2011. Under the cover of these legal immunities, Iraq successfully restructured most of its debt stock on terms that gave Iraq debt relief (in net present value terms) of at least 80 percent.

10. Conclusion

Failure to repay sovereign debt on the contractually envisaged terms is costly. It can disrupt access to finance, trigger or deepen banking crises, depress investor and consumer confidence, damage debtor reputation, and—depending on how it is executed—expose sovereigns to legal risks that can shut off channels of private external finance over a protracted period.

A swift debt restructuring that is both supported by a large majority of creditors and achieves sufficient debt relief to restore a country to solvency can significantly reduce these costs. But getting there is not easy, even when the debtor and a majority of creditors negotiate in good faith. Apart from the inevitable conflict of interest between creditors and the sovereign debtor, debt restructuring requires overcoming asymmetric information problems—particularly with respect to the debtor’s ability to pay—as well as the inherent temptation of creditors to free ride on the concessions made by other creditors.

This chapter has attempted to distil some lessons from past debt restructurings that help navigate these problems: (i) bring in the IMF as early as possible; second only perhaps to hiring competent and experienced legal and financial advisors; (ii) have extensive consultations with creditors (but not necessarily through creditor committees); (iii) promote—through carrots and sticks—coordination amongst groups of creditors, especially in dealing with the hold-out creditor problem; and (iv) beware the temptation to ask for either insufficient debt relief (leading to serial restructurings) or excessive debt relief (leading creditors to view the process as confiscatory or expropriatory). Despite the commonalities of restructurings, the many innovations noted in this chapter are evidence that no restructuring is quite like another. Going forward, approaches will inevitably continue to adapt to deal with new challenges.

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Challenges Ahead

*Hugh Bredenkamp, Ricardo Hausmann, Alex Pienkowski,
and Carmen Reinhart*

Sovereign debt ratios in advanced and emerging economies have grown to near record highs, while in low-income countries, debt levels have been gradually building since the debt relief of the early 2000s (Figure 9.1). If global monetary conditions tighten, the burden of debt will grow, and roll-over risks will increase. And with a more fragmented creditor base, timely and orderly restructurings may become harder to achieve. This chapter takes stock of the sovereign debt landscape today and considers potential problems that might lie ahead for both creditor and debtor countries alike. In order to prevent or mitigate these risks, a number of policy options are suggested, some of which can be pursued by individual countries alone, while others may require multilateral action to improve the international architecture.

Section 1 considers the conjuncture from the viewpoint of low-income, emerging, and advanced economies, and describes shifts in the creditor base, which cut across country groups. Section 2 considers policies that, in light of these risks, might *reduce* the likelihood of a debt crisis. Focus is given to the role of fiscal rules, policies to reduce risks from the financial sector, ways to improve debt transparency, and finally, making debt safer through the use of state-contingent debt instruments. Section 3 looks at how crises might be better handled if, or rather when, they occur. Here attention is given to potential legal, contractual, and institutional reforms that can enhance both intra-creditor and debtor–creditor cooperation.

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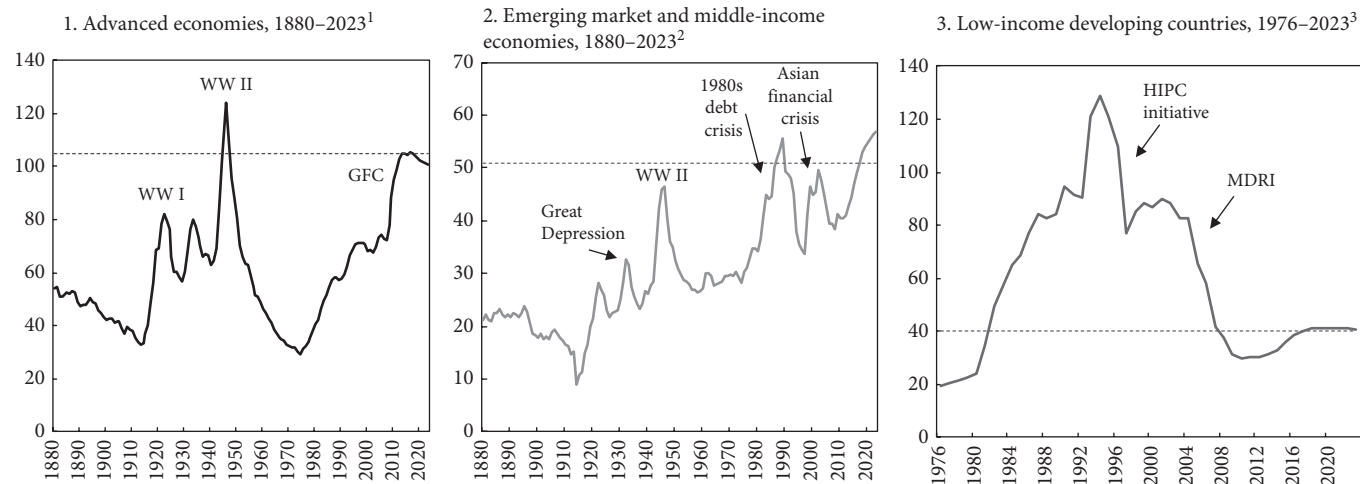


Figure 9.1 General government debt (% of GDP; average debt-to-GDP ratios are at historic highs)

Note: Average is calculated using GDP at purchasing power parity. Dashed lines refer to the debt level in 2017. WWI = World War I; WWII = World War II; GFC = global financial crisis; HIPC = heavily indebted poor countries; MDRI = Multilateral Debt Relief Initiative. Panel 1 Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong SAR, Ireland, Italy, Japan, Korea, Netherland, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Taiwan Province of China, United Kingdom, and United States. Panel 2 Argentina, Brazil, Bulgaria, Chile, China, Colombia, Egypt, Hungary, India, Indonesia, Iran, Jordan, Kazakhstan, Kenya, Malaysia, Mexico, Morocco, Pakistan, Peru, Philippines, Poland, Romania, Russia, South Africa, Sri Lanka, Thailand, Turkey, Ukraine, Uruguay, Venezuela. Panel 3 Bangladesh, Benin, Burkina Faso, Cameroon, Chad, Democratic Republic of the Congo, Côte d'Ivoire, Ethiopia, Ghana, Haiti, Honduras, Kenya, Madagascar, Mali, Myanmar, Nepal, Nicaragua, Niger, Nigeria, Papua New Guinea, Rwanda, Senegal, Tanzania, Uganda, Vietnam, Zambia, Zimbabwe.

Sources: Abbas et al. 2010; Bolt et al. 2018; IMF, Historic Public Debt Database; Maddison Project Database, version 2018; and IMF staff estimates and projections.

1. The Conjuncture

Since the financial crisis, global general government debt has risen by over 20 percent of GDP, reaching a post-war high. Despite this, Reinhart et al. (2017) note that there have been surprisingly few defaults compared to similar episodes over the last two centuries (Table 9.1). Previous spikes in country defaults were typically associated with a “triple bust”—a steep decline in capital flows, a collapse in commodity prices and a steep increase in the real interest rate. During these periods, the peak share of countries in default (as defined in Reinhart and Rogoff 2009), ranged from around 20 to 50 percent. Yet in the most recent crisis, which involved a “double bust” without a spike in interest rates, the share of countries in default was much lower. This section will dig down into the major recent trends in the scale and composition of sovereign debt, and consider whether these “missing defaults” have been avoided or merely delayed.

A. High debt, low growth, and big promises in advanced economies

A decade after the global financial crisis, advanced economy (AE) general government debt-to-GDP ratios are still over 30 percent of GDP above their pre-crisis level (Figure 9.2). After the immediate expansion of debt in the 2007–12 period, debt has essentially stabilized, with only euro area countries making some limited progress in reducing leverage. Chapter 4, “Debt Sustainability,” discusses the need to build “fiscal space” in order to deal with future downturns, especially financial crises.

Table 9.1 “Missing” defaults since 2011

Double bust episodes	Capital flow bust?	Commodity bust?	Real interest rate spike?	Share of countries in default (peak)
1824–1825	yes	yes	yes	43.8
1890–1894	yes	yes	no	18.6
1914–1918	yes	yes	yes	17.7
1929–1933	yes	yes	yes	46.4
1981–1986	yes	yes	yes	42.7
1991–1999	yes	yes	yes	46.3
2011–2016	yes	yes	no	13.8

Source: Reinhart et al. (2017).

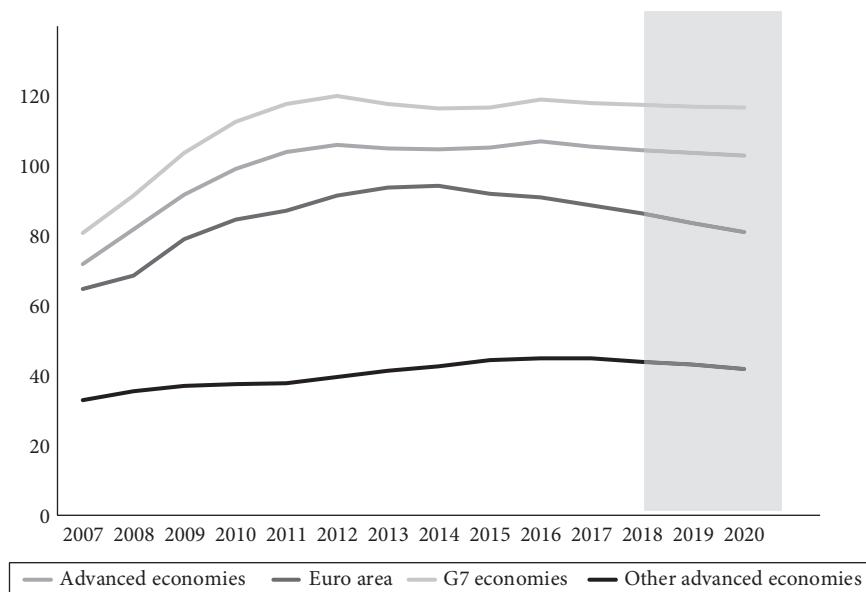


Figure 9.2 Debt-to-GDP ratio, advanced economies (%)

Source: IMF WEO.

A range of factors have contributed to the absence of meaningful deleveraging since the crisis, the most notable being the slowdown of nominal GDP. Potential output growth has been subject to several downward revisions. And while the drivers of the decline in the long-run economic growth rate are numerous (e.g., population aging, trend decline in productivity, the leverage cycle—see Buttiglione et al. 2014), trend growth has been shown to be an important factor underlying government debt dynamics (Mauro and Zilinsky 2015). In addition, inflation has also failed to rebound. Part of the explanation for this slow recovery in nominal GDP growth is the fact that the private sector—households, banks, and corporates—has attempted to adjust in response to the spike in debt, which has held back demand.

Chapter 6, “Reducing Debt Short of Default,” showed that in the postwar era, debt reductions in AEs typically relied on very favorable interest rate–growth differentials, which reflected both strong growth and deeply negative real interest rates. The postwar economic boom was supported by favorable demographics and technology innovation. And financial repression and high inflation led to negative real interest rates in many countries. From the 1980s, growth weakened, inflation was tamed and the financial sector was deregulated, all of which contributed to a jump in the interest rate–growth differentials. More recently, as a result of ultra-low interest rates, this differential has

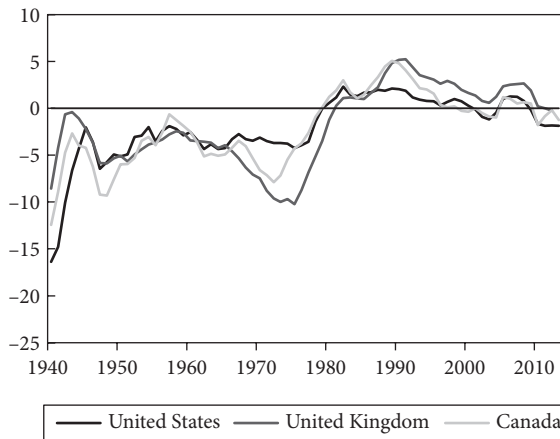


Figure 9.3 Real interest rate–growth differentials (% points)

Source: Haver, UK Office of National Statistics and authors' calculations.

again fallen into negative territory (Figure 9.3). But what might be expected in future?

Medium-term growth prospects remain modest in AEs. The IMF's Spring 2019 World Economic Outlook (WEO) projects growth to be only 1.6 percent in 2024, compared to the pre-crisis (1960–2007) average of 3.5 percent. Part of this weakness is linked to demographic trends. Employment growth is expected to be only 0.6 percent in 2024 (compared to 1.2 percent, pre-crisis), and this trend is likely to become negative in the longer-term, absent reforms. Another explanation for the weak growth outlook is the idea of “secular stagnation,” which presumes a permanent aggregate demand deficiency, which cannot be cleared by a sufficient fall in the real interest rate (Eggertsson and Mehrotra 2014). On the supply side, weak productivity growth has also been a puzzle in many AEs.

It might be argued that low growth is not an issue if interest rates also remain low. Indeed, the standard neo-classical framework suggests that these variables should be bound together (Holston et al. 2017). Interest rates have been persistently low in many AEs since the global financial crisis. However, empirical evidence has not always been supportive of such a close link between trend output growth and the natural rate of interest (Hamilton et al. 2015). A sudden rise in interest rates could shift an economy from a situation of stable debt and low interest rates into a bad equilibrium (Mauro and Zilinsky 2016). Such a jump might be triggered by an increase in the risk premia, driven perhaps by geo-political risks, concerns over a trade-war or financial sector fragilities.

On balance, however, it is reasonable to expect that nominal GDP growth and interest rates are likely to settle at modest levels over the medium term, suggesting that the differential between the two will be correspondingly small by historical standards. As such, this channel cannot be relied upon to substantially reduce debt burdens going forward.

If AEs are unlikely to experience persistently negative interest rate–growth differentials, what role can fiscal consolidation play? As discussed in Chapter 6, “Reducing Debt Short of Default,” the median improvement of the cyclically-adjusted primary balance over consolidation episodes was about 3 percent of GDP. Since 2007, AEs have, on average, only tightened their fiscal stance by around 0.5 percent of potential GDP (recall, the recent austerity drive was preceded by a large fiscal stimulus). If these economies were able to gradually tighten by a further 2.5 percent of potential GDP, a rough calculation suggests debt would not fall to pre-crisis levels until around 2032.¹ Importantly, Abbas et al. (2013) note that very few debt reversals occurred in a challenging environment of moderate growth that is, below 2 percent. Furthermore, an aging population also increases health and social security spending commitments (Figure 9.4). In most AEs, the adjustment needed to stabilize (explicit and implicit) debt-to-GDP ratios highlights important fiscal gaps (Lee and Mason 2017). All of this suggests that, even with the necessary adjustment efforts, persistently high debt is likely to remain an issue in AEs for at least a generation.

B. Emerging markets, emerging risks

Following a sharp fall in GDP during the global financial crisis, emerging market (EM) growth quickly recovered to around the long-run average. This robust performance, despite tepid growth in AEs, is partly explained by the improved fundamentals of these countries as they entered the crisis, which allowed many to pursue counter-cyclical policies. But it was also linked to the extraordinary monetary stimulus undertaken in AEs, which led to huge capital inflows, and a corresponding increase in EM sovereign debt. In fact, the level of debt in 2017 (51 percent of GDP) was last seen in the late-1980s,

¹ This is based on the standard debt accumulation equation summarized in Chapter 6. Growth and interest rates are assumed to be equal to those projected in the 2019 Spring IMF WEO from 2019 to 2024, and then remain constant at their 2024 level thereafter.

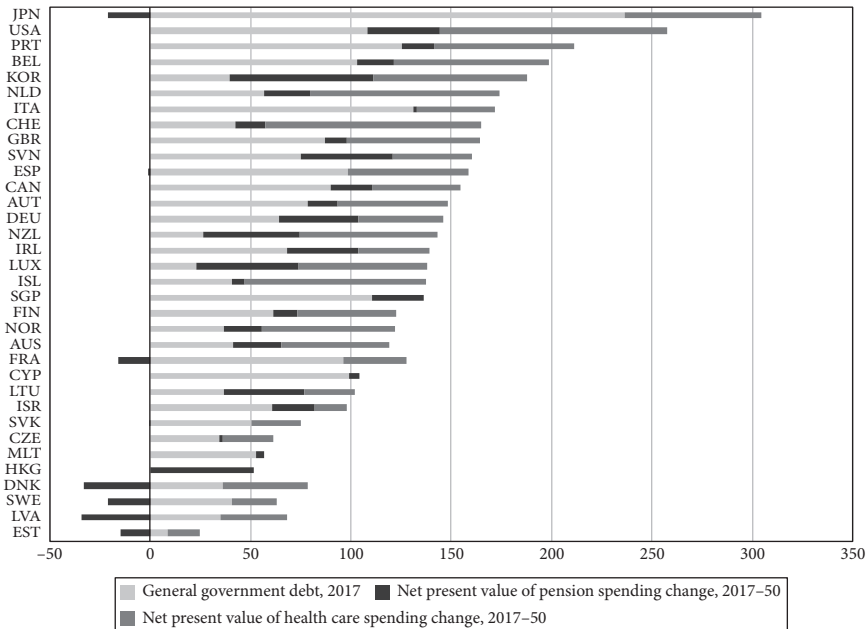


Figure 9.4 Debt-to-GDP including implicit liabilities from pension and healthcare spending, 2017

Note: Data labels in the figure use International Organization for Standardization (ISO) country codes.

Source: IMF staff calculations.

just prior to the Brady debt relief operations. This section explores some of the risks and vulnerabilities that this may expose in EMs.

Historically, a major source of vulnerability for EMs has been currency mismatches on the sovereign's balance sheet. The concept of "Original Sin"—the experience of EMs historically being unable to borrow in local currency on international capital markets, despite sometimes strong fundamentals—is discussed in Chapter 5, "Debt Management." However, since the seminal work by Eichengreen and Hausmann (1999) on this topic, EMs have been increasingly able to issue larger amounts of debt in domestic currency (Forslund et al. 2011). While domestic-currency debt as a share of total debt has risen by around 10 percentage points for the median country over the last fifteen years, the mean has increased by nearly 20 percentage points (Figure 9.5). This is because the largest EMs—China, India, Brazil, Russia, South Africa, and to a lesser extent Mexico—now issue virtually all of their debt in local currency. As well as strengthening balance sheets, this shift in the debt structure provides these economies with more flexibility to use the exchange rate to absorb shocks, rather than relying on selling reserves or internal adjustment.

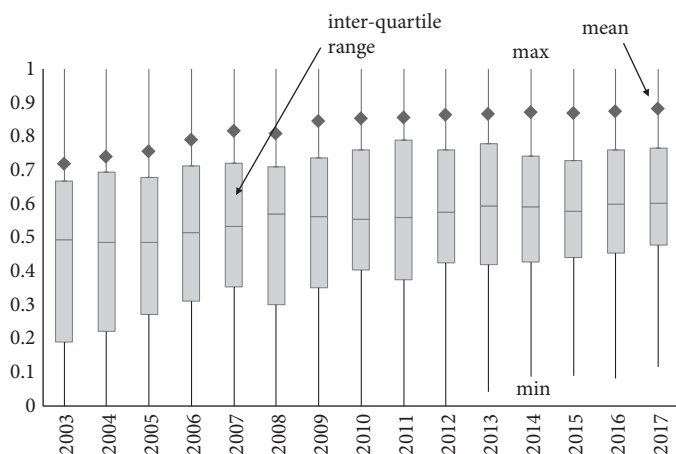


Figure 9.5 Domestic currency debt (share of total debt)

Source: WEO Staff Analysis.

While this shift to local currency debt has undoubtedly reduced currency risk, there has also been an increase in the share of debt held by non-residents, a creditor base which has historically been volatile. Over the last decade, the share of EM sovereign debt held by non-residents has increased by 10 percentage points to around 60 percent of the total (Arslanalp and Tsuda 2014). One potential explanation for the increase in foreign ownership of EM debt has been the rise in popularity of index-funds and benchmarks to track this debt (Raddatz et al. 2015). This rise in “passive” investment strategies has also been attributed to an increase in the correlation between country yields, even for countries that differ substantially in terms of policies, quality of institutions, and natural resources (Arslanalp and Tsuda 2015). This suggests that foreign demand may have been shaped more by “push” factors, than respective country fundamentals or “pull” factors.

Perhaps more striking is the shift in composition of the foreign creditor base. As holdings by the official sector (bilateral and multilateral development agencies, export credit agencies, etc.) has fallen, debt held by non-bank investors, such as pension and hedge funds, has increased dramatically (Figure 9.6). The rise in foreign ownership has been particularly acute for domestic-currency debt. And there are reasons to think that this creditor base may be particularly volatile. Investors that take on currency risk—seeking to benefit from “carry-trades”—are particularly sensitive to changes in global liquidity conditions and risk appetite (Menkhoff et al. 2012). A hint of this volatility was witnessed during the summer of 2013 after Federal Reserve Chairman Bernanke suggested that the US Federal Reserve may begin to withdraw monetary accommodation,

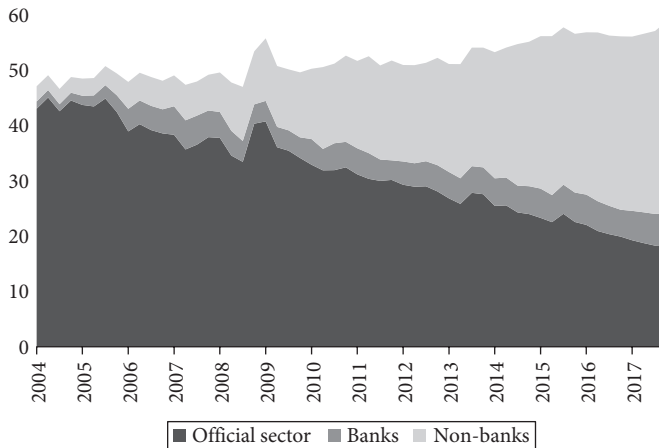


Figure 9.6 Debt held by non-residents (% of total)

Source: Arslanalp and Tsuda 2014.

and many EMs saw substantial rises in their long-term local-currency bond yields. More recently, in 2018 Argentina and Turkey experienced significant capital outflows. While driven partly by weak fundamentals at home, such pressures also coincided with a strong appreciation of the dollar and higher US bond yields.

Private debt also poses a risk to the sovereign's balance sheet. During the mid-1990s, many Asian economies experienced a rapid accumulation of private non-financial (PNF) debt. The currency crises that followed exposed serious balance sheet vulnerabilities, triggering a loss of market access for many sovereigns, and forcing several into IMF-supported programs. The last ten years has also seen a rapid increase in PNF debt (Figure 9.7). By far the largest contributor to this increase has been China, which has accumulated a stock of such debt exceeding US\$26 trillion. This is almost twice the size of all other EMs' PNF debt combined; represents over 200 percent of GDP; and is over ten times larger than its stock of foreign exchange reserves. A disorderly deleveraging process would not only harm China's economy but also have serious systemic spillovers to the rest of the world.

Other EMs have also witnessed a sizable, albeit smaller, increase in PNF—from 70 percent of GDP in 2007 to 90 percent in 2017, levels slightly above those experienced before the Asian Financial Crisis (Beltran et al. 2017). Of this, around one-third is denominated in foreign currency, also similar (but slightly below) levels seen in 1996. Clearly this is a source of vulnerability, but it is important to acknowledge that part of this expansion in credit is linked to financial deepening. Since the Asian Financial Crisis, real GDP per capita has

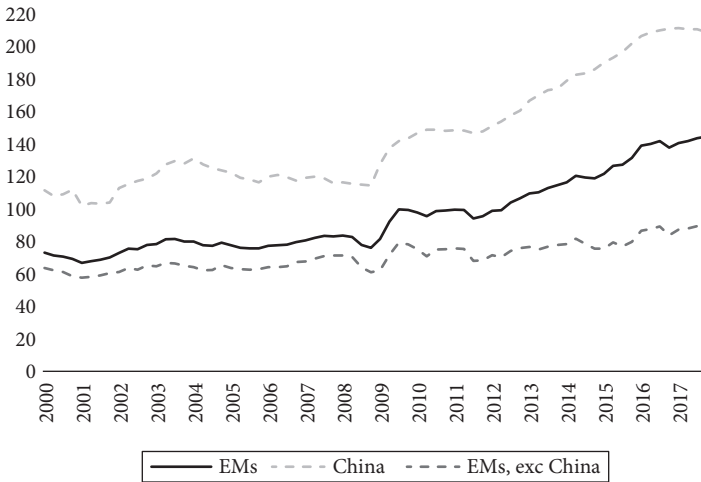


Figure 9.7 Non-financial private debt (% of GDP)

Source: BIS, Authors' calculations.

more than doubled; and the interest-coverage ratio of non-financial corporates is over twice the level it was in 1996 (Beltran et al. 2017).

In summary, if global interest rates tighten, and AE currencies (particularly the dollar and euro) appreciate, EMs are likely to experience a tightening in monetary conditions. Even with flexible exchange rates, sudden and large-scale capital outflows are a risk (Farhi and Werning 2014; Rey 2015), and can cause significant rollover problems for sovereign debt. While many EMs have built significant economic buffers in recent years, including substantial foreign exchange reserves, new vulnerabilities have also emerged. In particular, a significant increase in private sector debt—particularly in China—could compound problems from a sudden outflow of foreign capital.

C. Rising debt in low-income countries

A striking feature of the 2008–09 global financial crisis was the absence of sovereign defaults in low-income countries (LICs). While much of the period since the 1980s had been characterized by repeated default and restructuring in many LICs, these countries entered the crisis with relatively strong fundamentals, including modest fiscal deficits and their lowest debt levels in decades, thanks largely to the debt relief efforts of the late-1990s and early 2000s (Figure 9.1).

The Heavily Indebted Poor Countries (HIPC) initiative, and associated Multilateral Debt Relief Initiative (MDRI), discussed in more detail in Chapter 1, “Public Debt through the Ages,” had sought to achieve a sustained exit from the cycle of repeat restructurings and refinancing of official sector loans to LICs. To achieve this, recipient countries were required to first establish a track-record of strong policy performance under IMF and World Bank supported programs, before receiving large write-downs of both official bilateral and multilateral debt. By 2007, this had resulted in the average debt-to-GDP ratio in recipient countries falling by around 70 percent, relative to the early 2000s, while the conditionality associated with debt relief likely contributed to the relatively robust fiscal position entering the subsequent crisis.

In the first years after the global financial crisis, new debt accumulation in LICs was contained, with only a few exceptions. Developments in the availability of external financing were probably a factor: traditional bilateral donors pivoted their support towards grant rather than loan financing in the aftermath of HIPC, in part due to a desire to avoid new debt buildups. The main exception occurred in so-called “frontier markets,” where financing constraints were less binding, and many of these countries took advantage of ample global liquidity in the years following the financial crisis to access external commercial borrowing, including a growing number of Eurobond issuances.

Since 2013, however, there has been a shift to broad-based debt accumulation in LICs. More than 80 percent of LICs have experienced an increase in debt, with an average increase of around 14 percent of GDP. The drivers of these debt increases have been diverse, but a few broad patterns stand out (IMF 2018a):

- In commodity exporters such as Chad, Republic of Congo, and Nigeria, the collapse of oil and other major commodity prices in 2014 has been a major factor. Fiscal deficits in many of these countries widened sharply following the commodity price shock, while growth slowdowns and real exchange rate depreciation exacerbated the impact on debt burdens.
- In diversified exporters, fiscal positions also deteriorated after 2012. The drivers of deteriorating fiscal positions are quite diverse, and include current spending overruns (e.g., Ghana and Kyrgyz Republic), spending on capital projects (Bhutan, Kenya, Rwanda), and revenue disappointments (e.g., Zimbabwe, Sao Tome and Principe).
- In a few cases, fraud and corruption have been major factors, including hidden debts in Mozambique; fraud in Moldova’s banking system that

led to a large government bailout; and serious governance issues and embezzlement in The Gambia.

- Four countries were severely affected by internal conflict (Yemen and Burundi) or by the Ebola-epidemic (Liberia and Sierra Leone), and saw large debt increases.
- Increased rates of public investment have contributed to the debt buildups in many countries, but do not appear to have been a primary factor. For example, in the countries in which fiscal balances deteriorated since 2010, public investment increased in only half, and in only a third could it fully explain the fiscal balance deterioration.

In addition to the size of the recorded debt buildup, a further concern is that the true debt picture may be worse than revealed by headline debt data. Coverage of debt outside the central government, including on government guarantees and SOE debt, is often limited, despite the evidence that these claims often fall to the government (see Chapter 2, “Concepts, Definitions, and Composition”). For example, there has been rapid growth in the use of public–private partnerships, creating substantial new contingent liabilities. These worries are exacerbated by several recent cases in which hidden debts have been revealed, including in Mozambique, Republic of Congo, and Togo (IMF-WB, 2018).

Shifts in the composition of finance towards less concessional borrowing have also increased the likelihood of debt service difficulties. As will be discussed in subsequent sections, there has been a shift towards loans from Non-Paris Club (NPC) creditors and external commercial borrowing, typically at shorter maturities and less favorable interest rates than the traditional sources of external financing in these countries. The result is that refinancing needs are elevated in many countries, and exposure to interest rate risk and capital flow reversals has increased, including from non-resident participants in domestic debt markets.

These developments have led to fears of a renewed debt crisis in LICs (Jubilee Debt Campaign 2017). Debt vulnerabilities have risen substantially, as captured by deteriorating assessments under the IMF-WB’s debt sustainability analyses (DSAs, Figure 9.8). Forty percent of LICs are now considered to face significant debt difficulties, and several countries are already facing acute distress. Chad was forced to seek a debt restructuring in 2018, while the Republic of Congo and Mozambique have fallen into default to external creditors and face difficult restructuring discussions. There may also be cases where debt contracts are being restructured, but not reported;

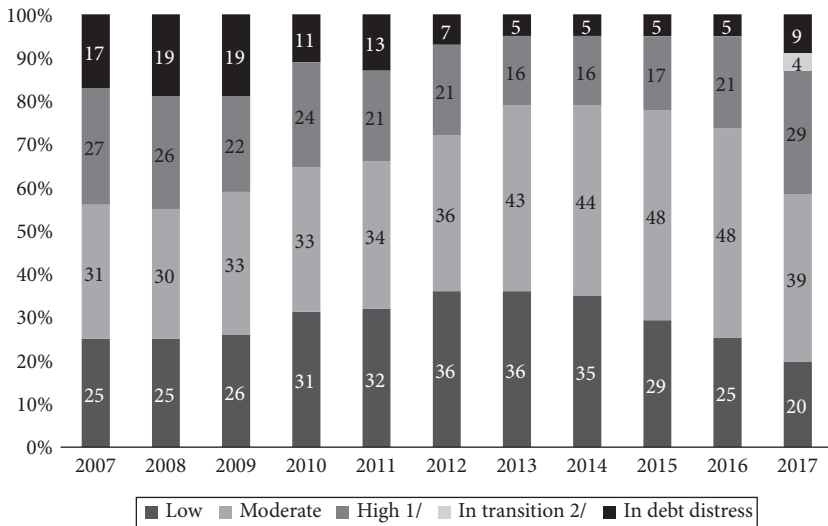


Figure 9.8 IMF-WB risk of debt distress ratings (in % of PRGT-eligible LIDCs with DSAs)

Source: IMF-WB LIC DSA database.

particularly if the debt in question is official debt not restructured through the Paris Club or debt where the scale or terms of lending have not been reported. In this sense, the scale of the debt problems faced by LICs may be under-reported. Furthermore, absent a change in these trends, more cases of debt distress could soon be on the horizon.

D. A changing creditor landscape

Accompanying the rise in debt vulnerabilities in LICs and EMs, there have been significant changes in debt and creditor structure that looks set to complicate crisis resolution.

The first of these changes has been a dramatic shift in the “official” creditor base, with various “non-traditional” creditors growing in importance. NPC creditors have become the dominant source of official bilateral financing, particularly to LICs. By far the most prominent of these is China. Estimates of the scale of Chinese lending vary widely. The China Africa Research Initiative (CARI) report that over 2000–17, the Chinese government, banks, and contractors extended US\$143 billion in loans to African governments and their

state-owned enterprises (SOEs), with much in the form of export or suppliers' credit, which is lent on commercial rather than concessional terms. Dreher et al. (2017) suggest an even larger figure: they estimate that between 2000–14, the Chinese government committed over US\$350 billion in official financing to 140 countries across the world—roughly equal to that of the US government. Going forwards, the “Belt and Road Initiative” has the potential to unlock even larger flows, with claims by China of total potential investment of US\$4 trillion—thirty times larger than Marshall Plan lending in current prices (The Economist 2016). The People's Bank of China also has an extensive system of swap lines with thirty central banks, amounting to around US\$500 billion in 2015 (Li 2015). Other major EMs, such as India and Saudi Arabia, have also steadily increased their official lending over the last decade (IMF–WB 2015), although the size of this lending is small relative to China. At the same time, since the HIPC–MDRI Initiatives, Paris Club creditors have shifted the composition of their support to LICs towards grants and sovereign guarantees, and away from direct loan disbursements. The result is that the largest part of official bilateral debt in many developing countries is now owed to NPC creditors.

A similar trend, though less advanced, has occurred among multilateral creditors, with so-called “plurilateral” institutions growing in significance (see Case Study 9.1). These plurilateral creditors² have more limited membership than the traditional multilateral creditors,³ particularly among AEs, but are steadily gaining importance, not least through the creation of new entities such as the Asian Infrastructure Investment Bank. While the long-established multilateral creditors have continued to extend new loans to developing countries, debt-relief granted under HIPC and MDRI have caused their shares of the debt stock to decline, further emphasizing this shift (Figure 9.3).

As explored in more detail in Section 3, this shift in the creditor base has the potential to create challenges for effective crisis resolution. The Paris Club has a well-developed framework for providing debt relief in a cooperative manner. Such a framework is absent for many of the new bilateral creditors and plurilateral institutions, increasing the risk of coordination problems, which could delay and complicate future restructurings.

Another potentially problematic trend is the growth of collateralized debts. These arrangements are most common in the context of commodity

² See IMF (2018a) for a list of multilateral and plurilateral lending institutions.

³ Such as the IMF and World Bank, among others.

Case Study 9.1 Plurilateral creditors in The Gambia

The experience of The Gambia illustrates the issues that can arise in addressing debt sustainability with plurilateral creditors. In The Gambia's case, debt sustainability concerns have been the result of an erosion of economic institutions and institutional capacity, political instability, susceptibility to climate shocks, and theft of public funds by a former regime. Reflecting the legacy of these vulnerabilities, the IMF's assessment at the time of writing (IMF 2018b) reports debt to be "unsustainable," having reached 129 percent of GDP at end-2017—an exceptionally elevated level for a LIC.

The Gambia's high debt stock is characterized by a sizable amount of loans extended by relatively new "plurilateral" institutions, at over one-third of external debt. These include the Islamic Development Bank, the Arab Bank for Economic Development in Africa, the OPEC Fund for International Development, and the Economic Community of West African States. These entities are a part of the official sector and extend non-commercial credit to other sovereigns. However, while they have more than one shareholder, and are therefore not bilateral lenders, they do not have universal or open memberships.

Established policies and procedures for dealing with overborrowing have little to say about how to involve plurilateral creditors in finding solutions to unsustainable debt situations, and the institutions involved—being comparatively new—have little experience in restructuring their claims. Given that they are not bilateral lenders, there is no forum like the Paris Club to guide effective creditor cooperation.

	Nominal value			Present value ¹		
	Percent of			Percent of		
	US\$ millions	GDP	External Debt	US\$ millions	GDP	External Debt
Total external	685.6	67.5	100.0	489.3	48.1	100.0
Multilateral creditors	239.8	24.1	35.8	149.1	15.0	31.2
International Development Association	105.1	10.6	15.7	58.3	5.9	12.2
African Development Bank	55.4	5.6	8.3	31.4	3.2	6.6
International Monetary Fund	51.5	5.2	7.7	41.3	4.2	8.6
International Fund for Agricultural Development	27.7	2.8	4.1	18.2	1.8	3.8

Continued

Case Study 9.1 *Continued*

	Nominal value			Present value ¹		
	Percent of			Percent of		
	US\$ millions	GDP	External Debt	US\$ millions	GDP	External Debt
Plurilateral creditors	238.8	24.0	35.6	180.1	18.1	37.7
Islamic Development Bank	141.8	14.3	21.2	102.7	10.3	21.5
Arab Bank for Economic Development in Africa	43.4	4.4	6.5	32.5	3.3	6.8
OPEC Fund for International Development	34.6	3.5	5.2	28.9	2.9	6.1
ECOWAS	18.9	1.9	2.8	15.9	1.6	3.3
Bilateral creditors	163.4	15.2	22.6	128.6	12.0	24.9
Paris Club	5.6	0.6	0.8	4.6	0.5	1.0
Non-Paris Club	157.7	15.9	23.5	123.9	12.5	26.0
Of which: Kuwait Fund	42.7	4.3	6.4	33.5	3.4	7.0
Of which: Saudi Fund for Development	30.2	3.0	4.5	16.7	1.7	3.5
Of which: Export-Import Bank of India	28.0	2.8	4.2	22.9	2.3	4.8
Private creditors	43.7	4.1	6.0	31.5	2.9	6.1

¹ Calculated at a discount rate of 5 percent, see IMF (2013) *Unification of Discount Rates Used in External Debt Analysis for Low-Income Countries*.

Sources: Gambian authorities, major creditors, and IMF staff calculations

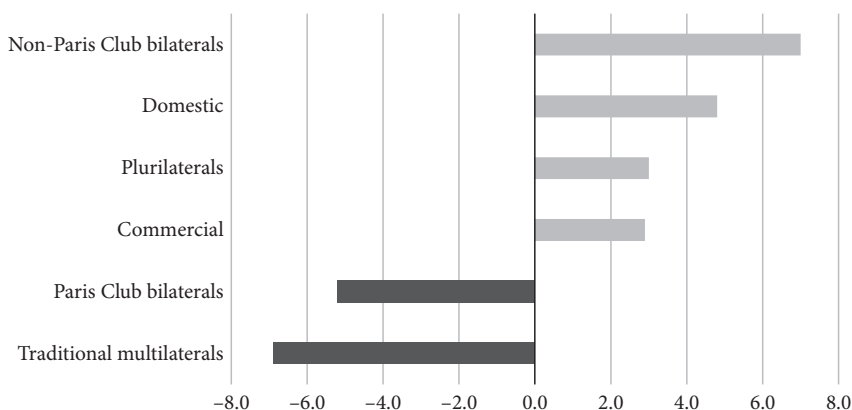


Figure 9.9 Change in LIDC creditor composition

Note: Average across thirty-seven countries with continuous data. The figures reported for debt owed to the Paris Club might be slightly higher if claims of Korea and Brazil, which joined the Club in 2016, were included retrospectively.

Sources: 2017 Survey of IMF country desks; BIS-IMF-OECD-WB Joint External Debt Statistics; WB International Debt Statistics; IMF International Financial Statistics; and IMF Staff Reports.

exporters, and involve the provision of finance secured against either future commodity exports or, in some cases, specific project revenues (Brautigam and Hwang 2016). In this sense, collateralization has been one way to overcome credit and legal risks by granting these creditors *de facto* seniority (limiting the ability of debtors to defer paying these creditors in a restructuring event). Such creditors include both commodity trading firms (Franke et al. 2017), and some NPC bilateral creditors. For sovereign borrowers, however, collateralization reduces the room for maneuver in the event of a crisis, making restructurings more difficult. These debt contracts also raise other important questions, including their apparent inconsistency with negative pledge clauses, which are a feature of World Bank (IBRD and IDA) non-concessional lending policies, among others.⁴ Recent experiences have illustrated this challenge:

- In Chad, the government had undertaken loans from commercial creditors backed by oil shipments. Following the plunge in commodity prices in 2014, the government experienced significant fiscal stress and sought to restructure this debt in 2015 and 2018. The presence of such collateralized debt significantly increased the complexity of the restructuring.
- The Republic of Congo's government undertook oil-backed lending through two channels. First, it linked commercial loans from commodity traders to oil shipments. Second, it obtained concessional bilateral loans from China that were secured by oil receipts deposited in an off-shore escrow account. Like Chad, Congo entered severe stress after oil prices dropped in 2014. The government subsequently sought to undertake policy adjustments and a debt restructuring to restore sustainability, but by end-2018 a definitive resolution had yet to be reached.

Transparency concerns arise not only on account of potentially “hidden debts,” but also owing to uncertainties around the terms and conditions of borrowing, including collateralization arrangements (IMF-WB 2018). The full extent of collateralization is often unknown, and in some of the recent crisis cases, such as Chad and Congo, only become clear once these countries were already experiencing debt distress. There are also information gaps on other terms and conditions, which can make it difficult to determine the extent of risks in the debtor country, and in some cases even to assess whether the claims are commercial or official in nature (Dreher et al. 2017).

⁴ These clauses prevent a debtor pledging as collateral assets that might jeopardize the repayment of an existing creditor.

The surge in collateralized debts is just one example of a recurrent issue in sovereign debt markets, namely the attempt to create “restructuring resistant” contract designs. The general problem is that a sovereign subject to credit risk faces a temptation to reduce the interest rate on its new borrowing by introducing new “senior” or “restructuring resistant” debt (Bolton and Jeanne 2007). The incentives for this kind of behavior only get stronger as the risk of default increases, and governments finding themselves close to default may be tempted to “gamble for redemption” by introducing new, more senior debt.

The growth of plurilateral lending could also be viewed through this lens, as the lending institutions seek to achieve seniority over official bilateral and private creditors. There is some evidence that in practice official bilateral creditors have de facto ranked below even private lenders in the creditor hierarchy (Schlegl et al. 2015), whereas multilateral creditors are typically viewed as “super senior.” A potential restructuring in Venezuela could raise similar issues (Buchheit and Gulati 2017), since in addition to explicit collateralization, the state-owned oil company (PDVSA) has significant physical assets in the United States, which could be at risk of seizure authorized by US courts, giving certain creditors an additional form of leverage in a negotiation (Case Study 9.2).

Case Study 9.2 Venezuela

Despite having the world’s largest oil reserves, Venezuela is undergoing an unprecedented economic crisis, and is on the verge of what could be an extremely disorderly and complicated debt restructuring. Debts by the Venezuelan government and the state-owned oil company, *Petróleos de Venezuela, S.A.* (PDVSA) will be difficult to resolve for several reasons:

- The creditor base is very heterogeneous, comprising private creditors, official bilateral creditors (of which the largest claim lies with an NPC creditor, China), and multilateral agencies. Given challenges to coordination, separate debt restructuring operations might have to be conducted in parallel with each of these groups.
- The debt structure is complex. Some of the loans are collateralized making creditor interests diverge from that of the broader group. Of the tradable bonds, whereas most of the Venezuelan government bonds include CACs, the PDVSA bonds do not, raising the likelihood

of holdouts. There have also been cases where debt instruments (including so called “promissory notes” have been sold to creditors at highly discounted prices relative to the face value. This raises the question of how to determine the appropriate size of a claim in a restructuring.

- The perimeter of the debt to be included in the restructuring is unclear, incentivizing hold-outs and raising inter-creditor equity concerns. The jurisdiction of each type of debt could also create complications: in the case of PDVSA’s New York law governed bonds, creditors could have recourse to seize the assets abroad of the Venezuelan government or PDVSA.
- Sanctions by the United States currently prevent US-based institutions from buying Venezuelan bonds, including those potentially issued under a debt exchange.

At the start of this section, the question was posed as to whether the “missing defaults” following the global financial crisis have been avoided or merely delayed. In most AEs, the concern is perhaps longer-term. It relates to how debt can be reduced in a low-growth environment without substantial changes in public spending commitments. The fact that a systemic crisis in these countries does not seem imminent perhaps implies that these difficult choices will be delayed until action is forced. In EMs, tightening global conditions could cause funding pressures for some, even though economic buffers are larger than in past years. In particular, the high share of private sector debt could lead to sudden and disorderly foreign capital outflows, which would have knock-on effects to public debt and the wider economy. In LICs, debt vulnerabilities are clearly on the rise, and it seems likely that further debt restructurings are on the horizon, even if there is uncertainty over the scale of the problem. For both LICs and EMs, what is clear is that the changing structure of lending to these countries will pose new problems for resolving crises. Nevertheless, the Section 2 considers what can be done to accelerate the pace of debt reduction or at least ensure that risks are better contained.

2. Strengthening Crisis Prevention

Prevention is better than cure. Chapters 6 and 7 illustrated that during times of crisis, the costs of policies designed to rapidly reduce debt can significantly

damage growth, destroy wealth, de-anchor inflation, and erode trust in institutions. Avoiding these actions should be a priority for policymakers. Nevertheless, any policy designed to meaningfully reduce such risks has costs. In Chapter 3, “The Motive to Borrow,” we saw that government borrowing can be beneficial—supporting growth when demand is weak or for investing in infrastructure and education to boost future growth. So, cutting back on borrowing can involve significant opportunity costs. Similarly, in Chapter 5, “Debt Management,” it is noted that a more resilient debt structure often involves paying higher interest rates. This chapter will not repeat the discussion of these policies. Instead, it will focus on some of the more recent policy innovations regarding crisis prevention strategies.

A. Avoiding unsustainable debt buildups

Several different approaches have the potential either to prevent debt building up to high or unsustainable levels or to guide debt ratios to lower levels when they are too high. This section will discuss three main avenues: adherence to fiscal rules, measures to mitigate risks from private debt, and improvements in debt transparency and responsible lending practices.

Fiscal rules

Fiscal rules—formal conditions that impose numerical limits on budgetary aggregates—are in fashion. As of end-2015, of the ninety-six countries included in the IMF’s Fiscal Rules Dataset (Schaechter et al. 2012), ninety-two have some form of national or supranational fiscal rule, most taking the form of budget balance or debt rules. But it would be a stretch to argue that each of these countries is a paragon of fiscal prudence (Figure 9.10). Some rules have so many exemptions and loopholes that they are rarely binding. Others are overly restrictive, preventing governments from reacting to changing economic needs. Others are simply ignored. So, what makes a good fiscal rule?

Fiscal rules are designed to act against some of the impulses to over-borrow and over-spend, described in Chapter 3, “The Motive to Borrow.” These impulses often occur when times are good, such as in an economic upswing or when commodity exports are booming. Fiscal rules seek to provide discipline on current and future governments. This suggests that such rules benefit from being (i) simple and commonly understood, so it is clear when the rule has been breached; (ii) flexible enough to adapt to unusual circumstances and changes in the economic environment, notably the business cycle, while

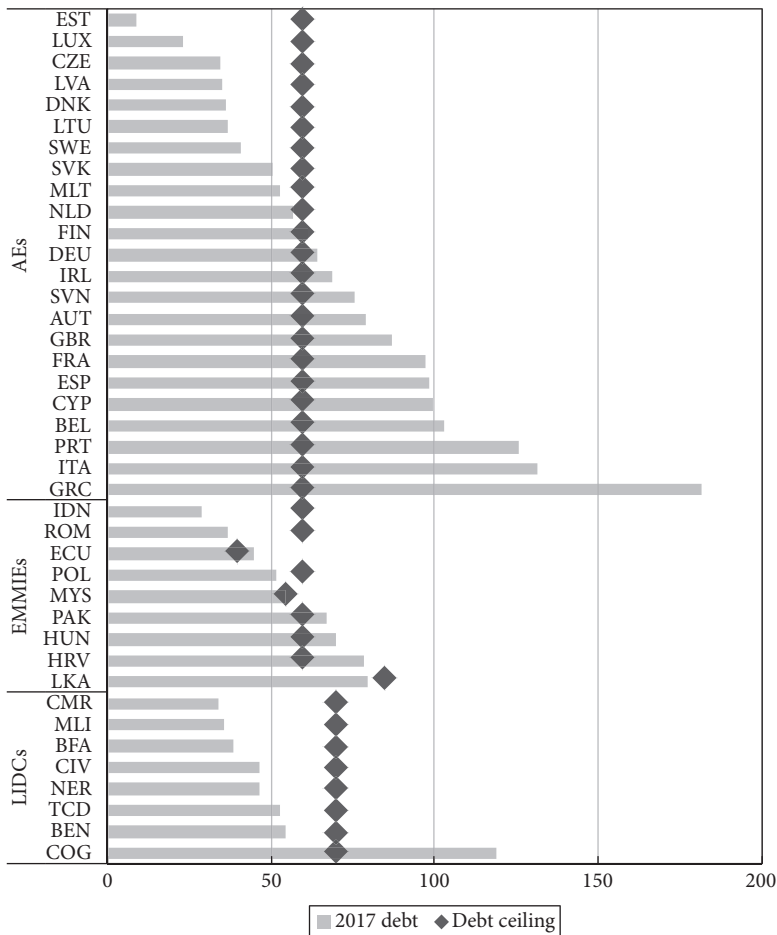


Figure 9.10 Debt levels in 2017 and debt ceilings under fiscal rules (% of GDP; in several countries, debt is close to or above debt ceilings defined under their fiscal rule)

Note: Data labels in the figure use International Organization for Standardization (ISO) country codes. AEs = Advanced economies; EMMIEs = Emerging market and middle-income economies; and LIDCs = Low-income developing countries.

Sources: IMF, Fiscal Rules Database; and IMF staff estimates.

remaining a binding constraint on government, and; (iii) costly if broken, to ensure compliance is incentivized. Against these criteria, expenditure rules—for example, where spending should not grow faster than trend GDP growth—have much to recommend them. They can be clearly defined, they are simple to articulate, and they are relatively robust to the economic cycle.

How effective are these rules in practice? Eyraud et al. (2018) show that countries with fiscal rules tend to have both smaller fiscal deficits and lower debt. Of course, as the authors acknowledge, there is a causality problem here. Prudent countries are both more likely to use fiscal rules and pursue sustainable policies. Heinemann et al. (2018) survey the existing literature and find that studies that attempt to control for this apparent endogeneity show little evidence that fiscal rules work, on average. However, as discussed above, there is a wide variation in the *quality* of fiscal rules. Caselli and Reynaud (2019) use an instrumental-variable approach, which confirms that, on average, fiscal rules have little causal effect on fiscal outcomes. Critically, however, they find that “well designed” rules (based on the IMF fiscal rule index, see IMF, 2009) tend to lead to stronger budget balances, that is, fiscal rules can be binding.

A more radical approach, as suggested by Wyplosz (2005) for example, might be to make the fiscal authorities completely independent agencies. The agency could be given control over the government’s overall borrowing envelope (perhaps governed by a medium-term debt target), while elected officials would decide on the details of how money is raised and spent. This, in theory, could significantly reduce “debt bias.” However, such a large transfer of power to unelected officials raises questions about democratic legitimacy, and, perhaps for this reason, there has been little serious policy discussion on this idea. A more common, although less ambitious initiative has been the introduction of fiscal councils—independent public institutions aimed at promoting sustainable public finances. These can play an important watchdog function over elected officials. They are typically viewed as important complements, rather than substitutes, for fiscal rules as they can magnify the reputational costs of breaching or manipulating the rules, making them more effective.

Finally, in the context of IMF and World Bank supported programs, there are often borrowing and debt limits agreed with the country in the form of conditionality. These are often used to support the adjustment process required to resolve internal and external macroeconomic imbalance. However, while these limits act to support adjustment in times of crisis, they do not provide a long-term anchor, so cannot substitute for strong, transparent, and responsible fiscal institutions. Developing such institutions typically requires broad domestic political support (Acemoglu and Robinson 2013).

Risks from the financial sector

While gradual buildups in debt can often be attributed to the “debt bias” of governments, this cannot explain sudden increases—the debt spikes. Such spikes are often driven by a collapse in the exchange rate, causing a jump in

the burden of foreign currency debt, or because the government assumes the debt of private agents—a contingent liability shock (Jaramillo et al. 2016). Of these contingent liability shocks, the bailout of financial institutions, especially banks, is often the key source. Bova et al. (2016), show that the average fiscal cost of a financial sector bailout episode is 9.7 percent of GDP, and has historically been as high as 57 percent of GDP. Furthermore, these episodes often occur in the midst of a recession, when the government debt is already growing, and such financial shocks will often exacerbate the downturn and deepen indirect fiscal costs further (Reinhart and Rogoff 2008).

Policies that seek to control the credit cycle to dampen boom–bust tendencies (macroprudential regulation, capital controls, etc.) and those that strengthen financial sector resilience (robust regulation and supervision) will not only reduce the fiscal risks, but also reduce the volatility of growth. Detailed discussion on dampening the credit cycle and strengthening financial stability is beyond the scope of this book—an interesting discussion can be found in Borio (2012). Instead, this section will focus on policies that explicitly limit the need and ability of governments to bail-out financial institutions, particularly banks, once a crisis has begun.

When a large (or even not so large) bank gets into trouble and is close to failure, there is often some expectation that the government will provide support to that institution for fear that a disorderly collapse could have systemic implications on the rest of the sector. Of course, this expectation is not only present in times of crisis, but will also change incentives in normal times. If investors anticipate at least some probability that their downside losses are limited, they are likely to be more tolerant of risk than otherwise (Nier and Baumann 2006; Hryckiewicz 2014; Hett and Schmidt 2017). This moral hazard-induced increase in risk-taking increases the probability of a crisis and implies an implicit subsidy from the taxpayer to the banks.

So why don't governments simply stop providing bailouts? Here lies a time-consistency problem. Such a commitment tends to lack credibility, as investors anticipate that in times of crisis, the costs of letting a bank fail will be seen by policymakers as outweighing the immediate benefits, regardless of the long-term implication. Any law, policy, or commitment passed in normal times may not survive the crisis, and investors anticipate this. Furthermore, there may be circumstances where well-designed support policies may *improve* financial stability and reduce the risk of bailouts. Ratnovski and Dell'Ariccia (2012) argue that a bank's success depends not only on the idiosyncratic risks they take, but also the stability of the system. If authorities can provide "systemic insurance," which is specifically designed to limit

contagion, then the incentives to be prudent may indeed increase. Farhi and Tirole (2012) suggest that governments should focus on system-wide support (lower policy rates, debt guarantees, lowering liquidity collateral standards, secondary market asset purchases), rather than individual bailouts. Bianchi (2016) argues that the moral hazard effects of a bailout are relatively limited if undertaken during a systemic crisis, and Keister (2015) argues that the complete prohibition of bailouts will be detrimental to society. Finally, Tucker (2015) discusses the important role of central banks in providing systemic liquidity insurance during a banking crisis, without straying into providing fiscal relief.

Governments are less likely to bail out a bank if measures have been put in place in advance to reduce the cost of “bail in,” that is, policies that make it easier for bank creditors to bear losses (see Dell’Ariccia et al. 2018, for a nice summary). In addition to requiring banks to retain more equity, subordinated debt, including contingent convertible (“co-co” bonds, is also increasingly used to increase the loss-absorbing capacity of banks.⁵ In circumstances where equity and subordinated debt is insufficient to absorb all losses, many jurisdictions (including the United States, European Union, Japan) have developed statutory bail in powers. Here, authorities can impose losses on unsecured senior creditors (normally with limits to losses on retail investors) without putting the bank through the slow process of liquidation. In principle, these tools are designed to maintain the viability of a systemically important bank without requiring taxpayer support.

Of course, such action risks spreading contagion if it has not been fully anticipated by markets. As discussed, policy credibility is critical to aligning investor expectations and reducing the risk of policy surprises. Many jurisdictions require banks to develop “living wills” plans designed by the bank to map their resolution—which help investors consider and prepare for the consequences of bank failure. And cross-border agreements between authorities to resolve multinational banks provide an important contingency planning mechanism. But perhaps the most credible—and likely most costly and controversial—policy action would be to force banks to become smaller and less inter-connected. In the UK, banks are required to “ring-fence” their retail banking services, in principle making it easier to rescue this part while letting the remainder fail. More ambitiously, the 1933 Glass–Steagall Act forced the actual separation of commercial and investment banking activities in the

⁵ Dagher et al. (2016) estimate that a risk-weighted bank capital ratio of 15–23 percent would allow banks to absorb most historic shocks—avoiding the need for bailouts.

United States. Interestingly, in 2016, both the Republican and Democratic Parties pledged in their election platforms to reinstate some form of this act. Time will tell whether this is ever enacted and in what form.

Debt transparency and responsible lending

Section 1 of this chapter illustrated a worrying trend of rising debt in LICs, with fraud and corruption playing a key role in a handful of cases. These incidents were driven by “hidden debts,” a combination of off-balance sheet borrowing activities, weak public debt recording and reporting, and poor governance. All of this has taken place amid a changing creditor and instrument landscape, evidenced by a shift toward non-traditional creditors and commercial debt. This section will look at what can be done to increase transparency on the scale and terms of lending to reduce the risk of such “debt surprises.”

Part of the solution must lie in improving the capacity of the institutions that record, monitor, and report debt (debt managers, budget approval teams, fiscal councils, etc.). The IMF, World Bank, United Nations, and other international institutions all provide resources and training to support such capacity building at the country level. Unfortunately, there seems to have been little improvement in recent years—in fact, the World Bank’s measure of “debt policy” capacity⁶ actually shows a modest deterioration over the last decade, which corresponds to a more general decline in the quality of “economic management.” While support from the international community can always be improved—and stepped-up efforts are underway—this points to the need for political commitment at the highest levels to ensure that the appropriate checks and balances are in place to correctly govern and control the issuance of new debt. Pressure can come from domestic sources, such as civil society or the legislative branch; or from external sources, both from the creditors and other actors.

On the creditor side, there are several codes of conduct in existence that seek to bind official creditors to a common set of lending principles (see for example, UNCTAD 2012; G20 2017; OECD 2018). Typically, signatories pledge, among other things, to ensure some degree of disclosure on at least the scale of lending provided to countries; and also a commitment for lenders to cooperate when a debtor faces repayment difficulties. Given that these codes are not legally binding on creditors, “enforcement” typically comes

⁶ Taken from the World Bank’s Country Policy and Institutional Assessment (CPIA) rating for “debt policy.” The reference is for the unweighted average of all International Development Association eligible countries.

through a combination of peer pressure from other creditors and pressure from civil society. Regarding the latter, Hausmann and Panizza (2017) propose setting up “odiousness ratings for public debt.” Akin to credit ratings, the debt of regimes would be rated in terms of the extent to which it is intended to benefit the citizens of the country, rather than the regime. It would become part of “soft international law” and might be used to determine, for example, whether such debt is included in the calculation of emerging-market indices.

B. Tackling uncertainty: the role of state-contingent debt

The previous sections have explored how countries can limit the risk of debt build-ups. Nevertheless, it is unrealistic to assume that all risks—external and domestic; economic and financial; man-made and natural—can be eliminated. In this context, the ability to share risk with creditors can be extremely beneficial. There are many ways to do this, and it is worth remarking that conventional debt contracts implicitly involve some potential risk sharing, in the sense that in extreme states of the world, sovereigns can and do renege on their debt obligations. But Chapter 7, “Sovereign Default” illustrates how costly this can be, especially when pursued through a disorderly default. In addition to the “deadweight costs” of default, such risk-sharing is also inefficient because it is largely confined to tail-events. There are many other states of the world where risk sharing—via more complete markets—could benefit both the sovereign debtor and their creditors, but these opportunities have not been realized. Over the last three decades, many proposals have been suggested, including by Krugman (1988), Shiller (1993), Borenszstein and Mauro (2004), Summers (2015), and Blanchard et al. (2016). Yet these instruments have only been used in a handful of cases and often in the context of a distressed debt exchange.

Benefits

State Contingent Debt Instruments (SCDIs) offer such risk-sharing benefits. These instruments explicitly link debt service obligations to pre-defined variables or states of the world. They are designed to alleviate pressure on debt obligation and/or financing needs in times of difficulty. SCDIs can include continuous adjustment features, for instance by linking debt to GDP or commodity prices; or discrete adjustment features, which kick-in when a certain event (such as a natural disaster) or threshold (such as a pre-defined interest rate) is reached.

SCDIs create “policy space” when needed, making it easier to use fiscal and monetary tools to mitigate the impact of adverse shocks. Take the example of GDP-linked bonds, which directly link debt service to the level of nominal GDP (see for example, Benford et al. 2016). During a recession, the value of this debt will decline, providing automatic debt relief and increasing fiscal space, which could be used for counter-cyclical policies. Similarly, by reducing the risk of default, it is less likely that the credit spread will tighten monetary conditions, thereby further supporting growth. Pienkowski (2017) illustrates how GDP-linked bonds act to raise a country’s maximum sustainable debt, that is, its debt limit (see Chapter 4, “Debt Sustainability”). And, like any countercyclical tool, SCDIs can help attenuate boom–bust cycles in public spending by requiring the sovereign to allocate a larger share of revenue to debt service in “good times.”

Costs and constraints

While the theoretical case for SCDIs seems strong, critics point to several practical costs and constraints that have inhibited their issuance. “First-mover problems” might mean that while a market could function well once established, being the first to issue is just too costly. Of course, even once established, SCDIs will be more expensive than traditional debt as they pass risk on to the creditor. However, in IMF (2017a) it is shown that the “volatility risk premium” on a GDP-linked bond may be relatively low, with estimates ranging from 20 to 150 basis points. The cost of borrowing may fall even further if markets anticipate that default risk on debt is also lower because of these instruments.

As with all forms of insurance, SCDIs bring with them the risk of adverse selection and moral hazard. Adverse selection might occur when investors have limited and asymmetric information of the “fundamentals” of a sovereign, such that the issuance of SCDIs may be perceived as a signal that the sovereign is riskier than previously thought. Moral hazard is also a concern, insofar as the sovereign may choose to pursue more risky policies because it has downside protection from SCDIs, thus increasing the risk of a crisis. While both factors might deter issuance, it is worth bearing in mind that such problems are also present in other debt management strategies, such as issuing at longer maturities or in local currency. And for countries with greater transparency and strong institutional and policy frameworks, these issues may not be acute.

Political economy constraints may also prevent issuance. As discussed in Chapter 3, “The Motive to Borrow,” policymakers may focus on short-term

costs at the expense of the benefits from longer-term risk mitigation. In this sense, myopic policymakers may choose not to pay the upfront cost of SCDIs, even if they are in the longer-term interests of their country. Relatedly, some have expressed concern that policymakers may manipulate data to artificially reduce debt service payments—for example, by reporting lower than actual GDP figures. While it is not clear how acute this risk might be (is a government really going to report a recession when it doesn't need to?), it does highlight the importance of clear and easily verifiable SCDI contracts.

Design and official sector support

Careful instrument design has the potential to mitigate some of the complications noted above. Importantly, instruments need to be designed such that they:

- link natural issuers with investors, thus supporting risk-hedging and also ensuring that these instruments are held by those able to bear losses;
- have relatively simple and homogenous contracts, preventing investors needing to invest resources in understanding new instruments;
- are supported by robust institutions and contracts that reduce the risk of abuse and manipulation, and;
- are supported by appropriate regulation and market treatment to prevent excessive risk migrating from the public to private sector, but also ensuring that the regulatory costs are not onerous.

Contract design, however, can only go so far in addressing the costs and constraints associated with SCDIs. And insofar as there are potential positive system-wide externalities associated with these instruments, official sector support may be warranted to kick-start larger scale issuance. Possible initiatives—increasing in ambition—could include:

- *Developing commonly agreed model contracts.* The official sector could partner with the private sector to mitigate the start-up costs associated with designing SCDIs.
- *Technical assistance to sovereigns.* There is scope for IFIs, think tanks, and practitioners to continue to discuss and explain the various features of SCDIs.
- *Development banks could underwrite and guarantee SCDIs.* This could support the issuance of SCDIs in cases where countries cannot afford such instruments on their own, notwithstanding the significant benefits associated with them.

- *Official creditors could expand or introduce state-contingent features in their lending.* Following the lead of the French development agency's (AFD) countercyclical loans (which have an adjustable grace period tied to exports), official loans could be made more state contingent.
- *A large sovereign (or institution) could lead-issue to help kick-start SCDI markets.* Issuance by a major sovereign is likely to command greater investor confidence and be associated with lower issuance premia.
- *Coordinated issuance by several sovereigns.* Such action may remove first-mover reticence and reduce the novelty and liquidity premia associated with the initial use of SCDIs.

Case Study 9.3 Grenada's hurricane clauses

In 2004, Hurricane Ivan caused widespread damage to the island of Grenada. This led the country to restructure its debt, primarily through maturity extensions, which gave temporary relief but ultimately did little to improve resilience to future shocks (Asonuma et al. 2017). In the aftermath of the global financial crises, Grenada again found itself unable to service its debt and pursued a restructuring. However, learning from mistakes in the past, this time it sought to both meaningfully reduce its debt obligations through nominal haircuts and introduce state-contingent features into some of its bonds. This not only provided relief during its current difficulties, but reduced the risk of crises occurring in the future.

The SCDIs involved including “hurricane clauses” into its bonds (Figure 9.11). These were designed to provide automatic cash flow relief immediately after a natural disaster, enabling funds intended for debt service to be redirected to more immediate needs, thus reducing the economic impact of the disaster. Key features of the clause include:

- *Verifiable trigger event measured by an independent entity.* Grenada is a member of the Caribbean Catastrophic Risk Insurance Facility (CCRIF) which provides insurance when an event meeting a certain pre-defined criterion occurs. If the insurance is triggered, the hurricane clause in the bond contract is also triggered.
- *Changes to the cash flow.* The clause provides for deferred payments for up to two payment periods, with no nominal principal or interest rate reduction.

Continued

Case Study 9.3 *Continued*

- *Maximum number of triggers.* The contract allows the trigger to be invoked up to three times.
- *Size of relief.* The cash flow relief is equivalent to the probable maximum loss of an event that occurs once in every twenty-five years in Grenada. A one-off trigger of the hurricane clause could provide cash flow relief of up to 2.6 percent of GDP.

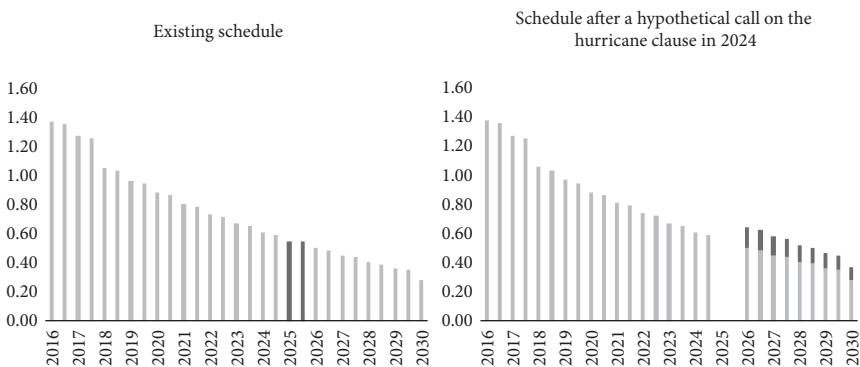


Figure 9.11 Debt service payments: 2030 bonds and taiwanese bond (% of GDP)

3. Strengthening Crisis Resolution

Despite best efforts to prevent the seeds of debt crises from taking root, some will inevitably take hold. This raises an important question: once crises do occur, how can they be resolved as quickly as possible, and with minimal costs to debtors, creditors, and “innocent bystanders”? Can the architecture of the international monetary system be improved to better meet such ends? A key requirement here is that such a system facilitates coordination among all the relevant actors in the crisis: the debtor, its creditors (official and private), and multilateral organizations—which may have divergent interests—and bring them all to the table to find workable solutions. This requires striking a balance between predictability and flexibility. The following section takes a look at the various legislative, contractual, and institutional reforms that might be pursued to strengthen the system.

A. Current framework

Three institutions have historically been central to sovereign debt crisis resolution in the post-war era: (i) the IMF, which as *de facto* lender of last resort, helps both to lend to a country and coordinate other creditors in providing finance; (ii) the Paris Club, a forum designed to coordinate debt relief amongst official bilateral creditors; and (iii) the London Club, which was an organic response to the 1980s Latin American debt crisis and served as the main forum for private sector involvement (PSI) during this period. Over time, this framework has been increasingly tested by the fragmentation of creditor bases, both private and official.

The London Club essentially disappeared in the years following the Brady Bond initiative. Syndicated bank lending fell out of fashion, and EMs predominantly issued external debt in the form of bonds. Rather than debt being held by a relatively small number of large banks, sovereign bonds were held by potentially thousands of small and diverse creditors, from retail savers to hedge funds to other governments. Given the lack of an effective institution to coordinate such creditors, contractual remedies were introduced to support crisis resolution.

On the official side, as discussed in Section 1, LIC and EM debt is now held by a diverse range of new lenders, including NPC bilateral creditors, “plurilateral” institutions, and sovereign wealth funds. Creditor coordination is much more challenging in this new landscape. This is partly because of the difficulty in getting such a large number of players with differing interests to come to the table, in a timely manner and on a common set of terms, when a crisis hits. But it also reflects the fact that the established boundaries between say, official bilateral and private claims, and between bilateral and multilateral claims, have become blurred. In other words, creditor seniority has become much more uncertain—and contentious.

In the past, seniority was a relatively straightforward issue, with creditor hierarchies accepted *ex-ante*, clearly identified, and generally respected. As discussed in detail in Chapter 7, “Sovereign Default,” official claims have traditionally been broadly accepted as deserving of more favorable treatment in a debt restructuring relative to private claims. This was essentially because the underlying financing was usually extended for public policy purposes, at preferential rates or at a time when recourse to private credit was not available. The architecture, including the IMF’s arrears policies (see Chapter 8), supported such norms. It was also fairly straightforward to identify whether a claim was official, as almost all official bilateral financing took the form of

loans extended by one sovereign entity to another. Finally, the Paris Club's "comparability of treatment principle" helped ensure that NPC bilateral or private creditors would contribute on terms at least as generous as those provided by the Club. But with Paris Club claims now often in the minority, this mechanism can no longer always be relied upon.

In sum, the current framework falls short, both in accommodating all types of creditors and catering sufficiently to all types of claims. There is no clear forum for resolving disputes should they arise. This ambiguity can delay restructurings and prolong sovereign stress, raising costs for all parties involved. There are several restructurings on the horizon that typify this new, more complex creditor landscape. Venezuela and The Gambia—where many NPC bilateral creditors, "plurilateral" creditors, and multilaterals are involved—provide two notable examples (see Case Studies 9.1 and 9.2 in Section 2). So, what can be done to strengthen the crisis resolution architecture?

B. Changing the law

One way to better formalize the rules of restructurings, *ex-ante*, would be to give all actors a predictable and binding set of actions to follow in a restructuring via a statutory approach. There is a long history of proposals to create statutory-based mechanisms to deal with debt crises—see Rogoff and Zettelmeyer (2002), for a survey. The best-known, from the IMF in the early 2000s, was the Sovereign Debt Restructuring Mechanism (SDRM). Motivated by Argentina's debt restructuring, the SDRM contemplated an amendment to the IMF's foundational treaty—the Articles of Agreement—to create a statutory framework for sovereign debt restructuring (Hagan 2005). The framework had many features of a corporate insolvency regime: majority restructuring, a stay on creditor action, and priority for new financing. The terms of the restructuring would have been subject to approval by the IMF, in the context of an IMF-supported program. Despite initial enthusiasm, a growing chorus of voices arose against the proposal. Creditor countries felt their rights would be diluted; debtor countries feared that it would discourage creditors from lending to them in the first place; and there was a general unease that such a framework would weaken sovereign rights and create moral hazard problems. However, the debate about the merits of a statutory framework to resolve sovereign debt have continued. In particular, there is a lively recent discussion about treaty-based approaches to sovereign debt restructuring in Europe (Buchheit et al. 2013).

While a multilateral statutory response seems unlikely, at least in the immediate future, some countries have adopted legislation to address more specific obstacles to effective debt restructurings.⁷ There has been a particular focus on the activities of “vulture funds,” which aim to recover the full value of their claims by litigation. There is a trade-off here, however. While distressed debt investors can adopt tactics that are highly disruptive, they can also provide important liquidity to bond markets and help with price discovery. Therefore, any efforts to address holdout behavior through legislation need to strike the right balance between deterring disruptive creditor behavior and preserving secondary market liquidity.

C. Contract design

In the aftermath of the Argentina default and following the failure to establish the SDRM, attention turned to contractual approaches to solve coordination problems among private creditors. The main initiative in this regard was the widescale introduction of collective action clauses (CACs) into international bond contracts. As discussed in detail in Chapter 8, “The Restructuring Process,” such clauses allow a restructuring deal agreed by a *qualified* majority of creditors to be binding on all creditors in a specific bond series. This was a significant step forward in limiting bondholders’ abilities to “hold-out” of restructurings in order to benefit at the expense of other creditors. However, it did not entirely eliminate the hold-out problem. In the 2012 Greek government debt restructuring several international bonds (the few that were not governed by Greek law) did not take part in the debt exchange, despite having CACs (Zettelmeyer et al. 2013). These bondholders refused to participate and were paid in full. This led to a further innovation (again, explained in detail in Chapter 8): the creation of “aggregation clauses,” which allow for voting to be pooled across issuances. There are several variants of this contract—“single-limb,” “two-limb”—that offer varying degrees of power to the majority of creditors at the potential expense of the minority. A case can be made for encouraging issuers to use a single standard design, so as to support legal and market clarity over such contracts.

⁷ For example, in 2010, England passed a law preventing creditors from pursuing debtors seeking debt relief under the Heavily Indebted Poor Countries (HIPC) initiative. Similarly, Belgium passed a broad anti-vulture funds law, which limits recovery by certain creditors to the amount they paid on the secondary market for the debt.

The use of *pari passu* clauses—traditionally “boiler plate” clauses that call for comparable treatment amongst creditors—has raised additional creditor cooperation challenges. In particular, in the course of Argentina’s 2005–10 debt exchanges, holdout creditors successfully argued, in US courts, that this clause had been breached. The courts ruled in favor of the creditors, and interpreted this clause as requiring a “ratable payment.” This meant that, if Argentina made all required payments to previously restructured bonds, then it would need to make all required payments on the defaulted bonds—implying that holdout creditors would be paid out in full. In the aftermath of this ruling, sovereign issuers (for example, Ecuador and Greece) have changed the wording of their *pari passu* clauses to explicitly rule out the US courts’ interpretation. Moreover, the International Capital Market Association has proposed a standard *pari passu* clause for sovereign debt contracts, which also rules out any obligation to make “ratable payments.” Concerted efforts to include these strengthened clauses in all new contracts would help limit legal vulnerabilities and enhance creditor coordination.

While improved debt contract design has helped to limit failures in creditor coordination for new issuances, it does not address the vulnerabilities in the existing *stock* of debt outstanding, implying that risks will diminish only gradually. For example, as of September 2017, it is estimated that only 27 percent of outstanding sovereign bonds included CACs with aggregation clauses (IMF 2017b). Therefore, the vast majority of the existing debt stock will remain vulnerable to hold-out risks for many years to come. One strategy to overcome this would be to use standard debt management operations to swap this legacy debt for bonds with the latest contract design. Such operations are often used to smooth the maturity profile of existing debt and, if undertaken when market conditions are benign, this is unlikely to be particularly costly. Indeed, over the long-run liquidity conditions could potentially improve if contract design within a country’s debt stock were made more homogenous.

D. Strengthening institutions

Turning to the *official* sector, it is clear that the fragmentation of the traditional creditor base has the potential to impede effective coordination. In this regard, existing institutions may need to adapt, and new ones may need to be created.

There already exists an institution to deal with official bilateral claims that has a track record in working with the IMF and others to resolve sovereign

debt crises since the 1950s—namely, the Paris Club. Adding more seats to the table can help bring more official creditors on board, whether permanently (as in the recent accession of Brazil and South Korea) or on an ad hoc basis (India, South Africa, and some Gulf countries). Given the established role of the Paris Club in “official sector involvement,” such an expansion would facilitate coordination among official creditors using a set of rules that have proven effective in the past.

More wide-ranging efforts to bring different creditor groups together might also pay dividends in facilitating effective debt resolution. The recently established “Paris Forum” was a first step in fostering greater dialogue between *all* official creditors and sovereign debtors. The focus of this group has been on policy dialogue, rather than looking into country-specific restructurings. It is conceivable that, over time, this could evolve into a vehicle that supports coordination of sovereign claims that fall outside the remit of the Paris Club—that is, forms of sovereign-to-sovereign claim that are not considered “official.” Such claims can arise where the original loans were not made for the purpose of providing support to the sovereign debtor. Take for instance the case where a sovereign entity holds *part* of a bond series issued by another sovereign.⁸ An example would be a sovereign wealth fund that holds a portfolio of assets that includes other sovereign bonds. Given that this type of debt is typically bought on the secondary market, and bonds in the same series will be held by other creditors, it would not be appropriate for the wealth fund’s claims to have seniority over other bondholders just because it is “sovereign.”⁹ Nevertheless, given the rising importance of this creditor group, it could help facilitate a debt restructuring if there were a forum designed to promote coordination among public sector entities holding secondary-market claims.

A more ambitious reform might be to seek better coordination between all creditors—private and official. Gitlin and House (2014) have suggested the need for a Sovereign Debt Forum. This non-statutory, membership-based, forum would provide a venue—much like the Paris or London Clubs—to facilitate early engagement among creditors, debtors and other stakeholders when sovereigns encounter trouble. However, achieving coordination with such a disparate group of creditors would be particularly challenging, especially in the absence of a rules-based mechanism such as the SDRM.

⁸ Sovereign bonds that were issued directly to, and are entirely held by, another sovereign (for example Russia’s exclusive holding of a 2013 bond issued by Ukraine), are presumably less problematic, as these can clearly be defined as “official” and could be treated under the auspices of the Paris Club.

⁹ If such claims were to be treated as official, a sovereign wealth fund could buy distressed debt on the secondary market, claim seniority in a debt restructuring and get paid in full, whilst the remaining creditors get diluted.

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APPENDIX

A Guide to Sovereign Debt Data

S. Ali Abbas and Kenneth Rogoff

Over the past decade, there has been a quantum leap in the development of long-dated cross-country sovereign debt databases that has provided both important resources for researchers, as well as a more complete frame of reference for policymakers and investors. To understand issues surrounding the risks and opportunities from sovereign debt, it is important to know not only current magnitudes, maturities, and currency of denomination, but also to have extensive historical data on these same variables. Otherwise, it is extremely difficult to meaningfully ask questions such as “At what levels of debt do emerging markets begin to face high risks of losing investor confidence?, Does entering a deep recession or financial crisis with very high public debt impede a country’s ability to engage in counter-cyclical fiscal policy?” This appendix showcases some of the resources now available.

It should be noted that although this topic received little attention from official lenders (including the International Monetary Fund (IMF)) until the 2008 financial crisis, the IMF has since devoted considerable resources and moved to the forefront of this topic (as of this writing). The IMF’s new work begins with the publication of the historical debt database of Abbas et al. (2010)¹—which importantly builds on the archival research of Reinhart and Rogoff (2009)’s *This Time is Different: Eight Centuries of Financial Folly*, and, more recently, the even more ambitious IMF 2018 Global Debt Database (GDD) which now provides the most comprehensive account of private and public debt since World War II (see Mbaye, Moreno Badia, and Chae 2018).²

While it may seem hard to believe, prior to Reinhart and Rogoff’s *This Time is Different* work (and their two earlier 2008 NBER papers³), modern researchers had access to only extremely limited long-dated historical data on total public debt. While data on public debt issued abroad was widely available, data on domestically-issued debt was extremely sparse. Indeed, such data was not available for most advanced economies for the period before the 1980s. The problem was worse for emerging markets and low-income countries,

¹ “A Historical Public Debt Database,” IMF Working Paper 10/245, also published as “Historical Patterns and Dynamics of Public Debt—Evidence from a New Database,” *IMF Economic Review*, Volume 59, Issue 4.

² “The Global Debt Database: Methodology and Sources,” IMF Working Paper 18/111. For the data, see <https://www.imf.org/en/Publications/WP/Issues/2018/05/14/Global-Debt-Database-Methodology-and-Sources-45838>. The GDD aims to address several shortcomings of previous databases. First, it takes a fundamentally new approach to compiling historical data. The GDD adopts a multidimensional approach by offering multiple debt series with different coverages, thus ensuring greater consistency across time. Second, it more than doubles the cross-sectional dimension of existing private debt datasets. Finally, the integrity of the data has been checked through bilateral consultations with officials and IMF country desks of all countries in the sample.

³ “This Time is Different: A Panoramic View of Eight Centuries of Financial Crises,” NBER Working Paper 13882; and “The Forgotten History of Domestic Debt,” NBER Working Paper No. 13946.

with studies like Abbas and Christensen (2007)⁴ forced to use banking system claims on government as a proxy. This fact (which was first emphasized in Reinhart, Rogoff, and Savastano 2003⁵) may sound incredible to those who are not empirical researchers using macroeconomic data. The reasons why the data was not better kept are something of a mystery, but it is nevertheless true that long-dated historical data on domestically-issued public debt and, hence, total public debt, was not available in any standard source, even the debt time series published by the IMF or the World Bank.⁶

This lack of historical debt data was a huge omission that, as Reinhart and Rogoff (2009) (and in several related papers) showed, led to a blind spot in research in many areas, for example, the risks of sovereign debt crisis, and the genesis of very high inflation. Importantly, Reinhart and Rogoff (2009) contained extensive documentation of data sources for constructing long-dated time series on public debt, both domestically-issued and issued abroad, offering a blueprint for replication and extensions, including the IMF's important research that followed. As Reinhart and Rogoff discuss, and as others have since replicated, a critical archival source turned out to be old volumes of the League of Nations. One fact Reinhart and Rogoff found was that, contrary to widespread belief, many emerging markets, including in Latin America, had been able to issue in earlier decades large quantities of long-term debt denominated in their own currencies. For many of these countries, therefore, the problem of "original sin" actually started with the hyperinflations of the 1980s and 1990s.

Another major gap in the data concerned the currency composition of debt. Even for debt issued abroad, data on currency of denomination had been very limited, except for the modern period (as for example the data employed in Bevilaqua, Bulow, and Rogoff, 1992).⁷ But, again, recent work by IMF economists (notably Abbas et al. 2014)⁸ has taken large strides in remedying this situation by providing extensive data on both currency of denomination and maturity, data that allows far more nuanced analyses of debt vulnerabilities than was previously possible.

More recently, there have been many other important advances, as embodied in the data sets listed below. Importantly, the databases listed in this appendix are all associated with careful scholarly research. Whereas they have been integral to construction of the IMF global database, they are of particular use for researchers precisely because there are typically associated research papers with detailed discussion and documentation that aid an understanding of the data, and potentially allow a check of the decisions made in constructing it by making reference to the original sources.

Caveat emptor: Tedious historical and archival research lies at the heart of many of these new data sets; it is hard enough to decide how to measure contemporaneous debt

⁴ "The Role of Domestic Debt Markets in Economic Growth: An Empirical Investigation for Low-Income Countries and Emerging Markets," IMF Working Paper 07/127.

⁵ "Debt Intolerance," NBER Working Paper No. 9908.

⁶ One explanation that is sometime presented is that, until the 1980s/1990s, many countries did not have modern debt management offices that would collect all debt data; and that these functions remained segregated in different parts of the finance ministries/central banks. However, this cannot fully explain why total public debt coverage was relatively good in the inter-war period, the lack of incentive to institute dedicated debt management offices till the 1980s, or why international financial institutions did not put greater priority on catalyzing the collection of historical domestic debt data.

⁷ "Official Creditor Seniority and Burden Sharing in the Former Soviet Bloc," Brookings Papers in Economic Activity 1.

⁸ "Sovereign Debt Composition in Advance Economies: A Historical Perspective," IMF Working Paper 14/162.

(for example, should the central bank and central government balance sheet be integrated?, how does one account for the debt of state-owned enterprises?, how does one account for government assets?, what about unfunded pension liabilities?) but historical ones are more difficult, particularly in the many cases where the data had effectively been lost or forgotten until recently—a widespread problem with public debt data. And the problems just increase when one wants to bring in other variables, for example, in forming debt/GDP ratios. Although some researchers seem blithely unaware of the fact, Gross Domestic Product is in fact a relatively modern construct, developed by Simon Kuznets and his collaborators in the mid-1930s. Economic historians have done very important work trying to artificially reconstruct historical data (most famously, the work of the late Angus Madison who curated data from many other researchers, <https://www.rug.nl/ggdc/historicaldevelopment/maddison/>), but there are huge gaps and many assumptions are required. Indeed, even many of today's advanced economies took many years after the Second World War to build up their statistical capabilities so that for quite a few states data before 1955 can be unreliable, and for some this is the case going into the 1960s.

A second important caveat relates to cross-country and time series comparability of debt data. Because researchers have an interest in developing long time series for as many countries as possible, they often make expedient decisions regarding inclusion/exclusion of data that can result in statistical inconsistencies: for instance, a long debt series for an individual country may concatenate central government debt in the early years with general government debt in later years (an issue made transparent in Mauro and others, 2013);⁹ or public debt numbers can be reported for two sovereigns for the same year but without noting the differences in instrument coverage, valuation basis, and netting of assets.¹⁰

With this background, readers should be able to better appreciate both the major gaps in sovereign debt data, as well as the important advances recently made by institutions and researchers to address those gaps. The Directory of Sovereign Debt Databases that follows provides a state-of-play on these advances, by providing a listing of known sovereign debt data sets currently available for use by researchers and practitioners.

Appendix Table 1 provides a tabular summary of the databases included in the Directory. These are listed in alphabetical order and subdivided into two broad categories: Researcher databases, and Institutional databases. For each database, information is provided on time and country coverage; as well on the types of variables included; these broadly fall into four categories: debt-to-GDP levels, debt structure (currency, maturity, holder profile); crises/restructurings; and other public finance.

Directory of Sovereign Debt Databases (as of September 2018)

Compiled by *Kunxiang Diao and Chengyu Huang*

⁹ “A Modern History of Fiscal Prudence and Profligacy,” IMF Working Paper No. 13/5, International Monetary Fund, Washington, DC.

¹⁰ To be able to analyze and balance the competing considerations of larger sample and comparability, and to appropriately qualify their conclusions, researchers may find useful the international methodological standards on compiling public sector debt (e.g., the IMF's *Public Sector Debt Statistics Guide for Compilers and Users*, 2013 and *Government Finance Statistics Manual* 2014).

Appendix Table 1 Summary of Sovereign Debt Databases

No.	Researchers/ Institution	Name of database	Coverage (years; <i>countries</i>)	Debt-to- GDP	Debt structure	Crises/ Restructurings	Other public finance
<i>Researcher Databases</i>							
1	Abbas Belhocine, El-Ganainy & Horton	A Historical Public Debt Database	1692–2018 <i>178 economies</i>	√	√		
2	Abbas & Christensen	The Role of Domestic Debt Markets in Economic Growth	1970–2007 <i>93 EMLICs</i>	√			
3	Abbas, Blattner, De Broeck, El-Ganainy & Hu	Sovereign Debt Composition in Advanced Economies	1900–2011 <i>13 AEs</i>	√	√		√
4	Arslanalp & Tsuda	Tracking Global Demand for Sovereign Debt	2004–18 <i>24 EMs and 24 AEs</i>	√	√		√
5	Beck, Demirguc-Kunt, Levine, Cihak & Feyen	Financial Structure Database	1960–2017 <i>214 economies</i>	√	√		
6	Cruces & Trebesch	Sovereign Defaults: The Price of Haircuts	1970–2013 <i>72 economies</i>			√	
7	Hall, Payne and Sargent	US Federal Debt 1776–1960: Quantities and Price	1776–1960 <i>United States</i>				√
8	Jaimovich & Panizza	Public Debt around the World	1991–2005 <i>96 economies</i>	√	√		
9	Jeanne & Guscina	Government Debt in Emerging Market Countries	1980–2013 <i>19 EMs</i>	√	√		
10	Kaminsky & Vega-Garcia	Systemic and Idiosyncratic Sovereign Debt Crises	1800–1960 <i>7 LatAm EMs</i>	√			
11	Mauro, Romeu, Binder & Zaman	A Modern History of Fiscal Prudence and Profligacy	1800–2011 <i>24 AEs, 31 EMLICs</i>	√	√		√
12	Merler & Pisani-Ferry	Bruegel Database of Sovereign Bond Holdings	1995–2017 <i>12 EC states; US</i>	√			√

13	Panizza	Domestic and External Public Debt in Developing Countries	1990–2007 <i>130 economies</i>	√		√
14	Presbitero	Domestic Debt in Low-income Countries	1970–2010 <i>44 LICs</i>	√		
15	Reinhart	Dates for Banking Crises, Currency Crashes, Sovereign Domestic or External Default (or Restructuring), Inflation Crises, and Stock Market Crashes (Varieties)	1800–2010 <i>70 economies</i>		√	√
16	Reinhart	Debt-to-GDP Ratios	1692–2010 <i>70 economies</i>	√	√	
17	Reinhart & Rogoff	This Time Is Different	1800–2017 <i>varies by dataset</i>	√		√
18	Scott	Managing the UK National Debt 1694–2018	1694–2018 <i>United Kingdom</i>	√		√
<i>Institutional Databases</i>						
19	BIS	Debt Securities	1952–present <i>157 economies</i>	√	√	√
20	Bank of Canada	Sovereign Default	1960–2017 <i>145 economies</i>		√	√
21	ECB	Debt securities issuance and service by EU government	2016–present <i>28 EU economies</i>		√	√
22	IDB	Living with Debt	1980–2013 <i>26 LatAm</i>	√	√	
23	IDB	Standardized Public Debt Database	2006–16 <i>26 LatAm</i>	√	√	√
24	IMF	Fiscal Monitor	2010–present <i>115 economies</i>	√	√	√

(continued)

Appendix Table 1 Continued

No.	Researchers/ Institution	Name of database	Coverage (years; <i>countries</i>)	Debt-to- GDP	Debt structure	Crises/ Restructurings	Other public finance
25	IMF	Global Debt Database	1950–2017 <i>190 economies</i>	√	√		√
26	IMF	International Financial Statistics	2000–present <i>194 economies</i>	√	√		√
27	IMF	Public Sector Balance Sheet (PSBS)	2000–present <i>38 economies</i>	√	√		√
28	IMF	World Economic Outlook (WEO)	1980–2000 <i>199 economies</i>	√	√		
29	OECD	General Government Debt	1995–2017 <i>OECD members</i>	√	√		√
30	World Bank	International Debt Statistics (IDS)	1970–2016 <i>Mostly EMLICs</i>	√	√		√
31	World Bank	Quarterly External Debt Statistics (QEDS)	1998–present <i>40 EMLICs</i>	√	√		√
32	World Bank	Quarterly Public Sector Debt (QPSD)	1995–present <i>40 EMLICs</i>	√	√		√

* AEs = Advanced Economies; EMs = Emerging Markets; EMLICs = emerging markets and low-income countries; LatAm = Latin America; EC = European Commission; ECB = European Central Bank; BIS = Bank for International Settlements; IDB = Inter-American Development Bank; IMF = International Monetary Fund

Researcher databases

1. “A Historical Public Debt Database,” IMF Working Paper No. 10/245, International Monetary Fund, Washington, DC¹¹

Authors: S. M. Ali Abbas, Nazim Belhocine, Asmaa El-Ganainy, and Mark Horton

Website: https://www.imf.org/~media/Websites/IMF/imported-datasets/external/pubs/ft/wp/2010/Data/_wp10245.ashx

Description: This database provides a very long time series of debt-to-GDP ratios for almost all IMF member countries. The earliest data point starts from 1692. Most G-7 countries and a few other advanced countries are covered since 1880 and the general coverage starts from 1970. The database is compiled by combing various cross-country databases such as the IMF’s World Economic Output and Statistical Handbooks from The League of Nations and the United Nations. Other official government publications and databases compiled by other previous researchers are also used.

Notes for researchers: This database aims to provide general government debt-to-GDP ratios. However, in a lot of cases (especially for the period before 1980), central government data was reported where data for general government was not available. Also, in the database, debt is scaled to nominal GDP. However, GNP and NNP were used when GDP was not available. Some data smoothing was applied when transiting from one source to another, but larger breaks were indicated in the database. This database does not disaggregate public debt into external and domestic.

Country coverage: 178 countries

Time coverage: 1692–2018 (partial coverage)

Frequency: Annual

2. “The Role of Domestic Debt Markets in Economic Growth: An Empirical Investigation for Low-Income Countries and Emerging Markets”

Authors: S. M. Ali Abbas and Jakob E. Christensen

Website: <https://www.imf.org/en/Publications/WP/Issues/2016/12/31/The-Role-of-Domestic-Debt-Markets-in-Economic-Growth-An-Empirical-Investigation-for-Low-20973> (contact Sabbas@imf.org for data)

Description: In this database domestic debt is defined as domestic currency debt owed to domestic citizens and as commercial bank’s gross claims on the Central Government plus central bank liquidity paper. The dataset excludes government debt held by retail investors and non-banking institutions.

Country coverage: 93 low-income countries (LIC) and emerging markets

Time coverage: 1970–2007

Frequency: Annual

3. “Sovereign Debt Composition in Advanced Economies: A Historical Perspective,” IMF Working Paper No. 14/162, International Monetary Fund, Washington, DC

Authors: S. M. Ali Abbas, Laura Blattner, Mark De Broeck, Asmaa El-Ganainy, and Malin Hu

Website: <http://www.imf.org/en/Publications/WP/Issues/2016/12/31/Sovereign-Debt-Composition-in-Advanced-Economies-A-Historical-Perspective-41899>

¹¹ Also published as “Historical Patterns and Dynamics of Public Debt—Evidence From a New Database,” *IMF Economic Review* Volume 59, Issue 4.

Description: This data set examines the composition of sovereign debt in thirteen advanced economies from 1900 to 2011 (Australia, Belgium, Canada, France, Germany, Ireland, Italy, Japan, Netherlands, Spain, Sweden, United States, United Kingdom). It is broken down by currency, maturity, holder profile, and marketability. It provides valuable insights into sovereign debt structure trends over the last century.

Notes for researchers: Each debt component (by currency, maturity, holder profile and marketability) is scaled to central government debt, except for Australia (sum of commonwealth and state debt) and Italy (general government debt). The construction of long series requiring combining data from different sources which in a number of cases resulted in significant breaks in the series (e.g. Australian data in 1950). In some other cases data is available but was not included in the data set as further verification of their accuracy is needed (e.g., German debt composition data for the initial post-Second World War years).

Country coverage: 13 advanced economies

Time coverage: 1900–2011

Frequency: Annual

4. “Tracking Global Demand for Sovereign Debt,” IMF Working Paper WP/14/39 (and WP12/284), International Monetary Fund, Washington, DC

Authors: Serkan Arslanalp and Takahiro Tsuda

Website:

<https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Tracking-Global-Demand-for-Emerging-Market-Sovereign-Debt-41399>

<https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Tracking-Global-Demand-for-Advanced-Economy-Sovereign-Debt-40135>

Description: The data set provides estimates of investor holdings of government debt of twenty-four emerging market economies and twenty-four major advanced economies. The investor base is grouped into six classes: domestic central bank, domestic banks, domestic nonbanks, foreign official sector, foreign banks, and foreign nonbanks. All data are either in face value or adjusted for valuation changes, where appropriate, to remove price revaluations.

Notes for researchers: This database is a consolidation of multiple debt databases (including International Financial Statistics (IFS), Bank of International Settlement (BIS), European Central Bank (ECB), Eurostat, Consolidated Portfolio Investment Survey (CPIS), Currency Composition of Official Foreign Exchange Reserves (COFER), and Quarterly External Debt Statistics (QEDS)) with authors’ estimations. It is subject to various measurement errors. (1) Estimates for foreign central banks’ holdings may be understated. In this paper, foreign central banks’ holdings are the sum of government securities held by foreign central banks as reserve assets and foreign official loans and the data is largely based on IMF’s COFER and CPIS. Other types of foreign assets that are not included as reserve assets are not included in this calculation. (2) Estimates for foreign bank holdings rely on BIS locational banking statistics. In that sense, some of those estimates may be overstated for countries where there is a large difference between locational and consolidated BIS statistics. (3) Foreign and domestic nonbanks are calculated as implied values in this paper which may include measurement errors.

Country coverage: 24 Emerging markets and 24 advanced economies

Time coverage: 2004–2018

Frequency: Quarterly

5. “Financial Structure Database”

Authors: Thorsten Beck, Asli Demirguc-Kunt, Ross Eric Levine, Martin Cihak and Erik H.B. Feyen

Website: <https://www.worldbank.org/en/publication/gfdr/data/financial-structure-database>

Description: This dataset is not focused on sovereign debt data but captures various aspects of financial institutions and markets that could be very useful for researchers, including: public/private bond market capitalization to GDP; international debt issues to GDP; loans from non-resident banks (net/AMT outstanding) to GDP.

Country coverage: 214 countries

Time coverage: 1960–2017

Frequency: Annual

6. “Sovereign Defaults: The Price of Haircuts”

Authors: Juan Cruces and Christoph Trebesch

Website: <https://sites.google.com/site/christophotrebesch/data>

Description: This database provides a list of restructuring events of public and publicly-guaranteed debt owed to foreign private creditors. Among the most important variables, the database contains debt restructure; preferred haircut; market haircut; face value reduction; and bond exchange. Also, the authors provide haircut estimates and further information on each arrangement.

Notes for researchers: The selection of restructuring cases is based on five criteria: (1) Public or publicly-guaranteed debt restructurings; (2) restructurings with foreign private creditors are included; (3) distressed debt exchanges; (4) medium- and long-term restructurings; and (5) restructurings that are implemented.

Country coverage: Global (all countries that restructured debt)

Time coverage: 1970–2013

Frequency: Date of occurrence

7. “US Federal Debt 1776–1960: Quantities and Price”

Authors: George Hall, Jonathan Payne and Thomas Sargent

Website: <https://github.com/jepayne/US-Federal-Debt-Public>

Description: This database provides d prices, quantities, and descriptions of all securities issued by the US Treasury between 1776 and 1960. It contains descriptions of every individual Treasury bonds and notes; times series data on the quantity outstanding for each bond and times series data on the market price for each bond.

Notes for researchers: Data is released on GitHub with some basic instructions on how to use them in python. More detailed description is available at: http://www.tomsargent.com/research/ReadMe_Pub.pdf

Country coverage: United States

Time coverage: 1776–1960

Frequency: Monthly

8. “Public Debt around the World: A New Dataset of Central Government Debt”

Authors: Dany Jaimovich, and Ugo Panizza

Website: <https://www.tandfonline.com/doi/abs/10.1080/13504850701719785>

Description: This database presents a complete series of central government debt for eighty-nine countries including all the major economies except the Eastern European

Transition States over the 1991–2005 period and for seven other countries for the 1993–2005 period.

Notes for researchers: In this database, public debt is defined as gross central government debt. Although, most of the data is from official sources, due to different fiscal centralization level, the exact reporting standard can still vary from country to country.

Country coverage: 96 countries

Time coverage: 1991–2005

Frequency: Annual (partially covered)

9. “Government Debt in Emerging Market Countries: A New Data Set”

Authors: Olivier Jeanne and Anastasia Guscina

Website: <https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Government-Debt-in-Emerging-Market-Countries-A-New-Data-Set-18923> (contact AGuscina@imf.org for data)

Description: This database provides several data series related to central government debt. This information is divided into domestic and foreign sources of debt. Domestic debt is decomposed by fixed or variable interest rate; short-term or long-term. Foreign debt is decomposed by private creditors or official creditors. Finally, the share of USD in foreign debt is also included.

Notes for researchers: The data only covers central government debt due to the difficulties of finding state-owned enterprise or local government debt. Also, the domestic debt of central banks is not included since the number is small. The definition of domestic debt is domestically issued debt in this database, and international debt means debt issued overseas.

Country coverage: 19 emerging countries

Time coverage: 1980–2013

Frequency: Annual

10. “Systemic and Idiosyncratic Sovereign Debt Crises—Database”

Authors: Graciela Kaminsky and Pablo Vega-García

Website: <https://www.gracielakaminsky.com/databases>

Description: The authors compiled information for six data series: exports (in British pounds), terms of trade (1900=100), international issuance relative to UK export trend, world imports (in British pounds), UK real interest rate, and debt service relative to the UK export trend.

Notes for researchers: The database captures data from 1800 to 1960, and data are presented in British pounds. Researchers should notice that Argentina, Brazil, and Chile started reporting export data since the early nineteenth century. But export data for Colombia, Peru, Mexico, and Uruguay are derived by using mirrored data of their main trading partners in the nineteenth century.

Country coverage: 7 countries (Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Uruguay)

Time coverage: 1800–1960 (partially covered)

Frequency: Annual

11. “A Modern History of Fiscal Prudence and Profligacy,” IMF Working Paper No. 13/5, International Monetary Fund, Washington, DC

Authors: Paolo Mauro, Rafael Romeu, Ariel Binder and Asad Zaman

Website: <https://www.imf.org/en/Publications/WP/Issues/2016/12/31/A-Modern-History-of-Fiscal-Prudence-and-Profligacy-40222>

Description: This database provides very long time series on various fiscal variables for a wide range of countries. It covers not only public debt stock but also the related fiscal balance and its subcomponents. Specifically, the dataset includes fiscal revenues, primary expenditures, government debt, interest paid on public debt and gross domestic product for fifty-five countries and for up to two hundred years. About half of the data came from publicly available cross-country sources such as IMF's World Economic Outlook, International Financial Statistics, OECD Analytical Database, the Statistical Yearbooks of the League of Nations, Montevideo-Oxford Latin American Database, and some previous work done by Marc Flandreau, Frédéric Zumer and Brian Mitchell. The other half of the data is collected from country-specific sources.

Notes for researchers: Coverage of the government sector varies from country to country mainly due to data limitations. The site reports at general government level where data was available. However, in most cases, general government data is difficult to collect for earlier years. In that sense, most observations before the 1960s cover only central government and latter switched to general government. Structural breaks are expected generally in the 1960s and 1970s. Those breaks are recorded in dummy variables.

Country coverage: 55 countries (24 advanced economies and 31 emerging and low-income economies)

Time coverage: 1800–2011

Frequency: Annual

12. “Bruegel Database of Sovereign Bond Holdings”

Authors: Silvia Merler and Jean Pisani-Ferry

Website: <http://bruegel.org/publications/datasets/sovereign-bond-holdings/>

Description: This database reports the quarterly and annually sovereign bond holding (resident banks, non-residents) as a share of total sovereign bond holdings across twelve European countries and the United States.

Notes for researchers: The database covers the sectorial holding of sovereign bonds for Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, United Kingdom, and United States. Quarterly data are available from 1997 to 2017. And the data are standardized and reclassified based on five categories (banks, central banks, public institutions, other resident sectors, and non-resident holders). The primary source of the data is the ECB, and national sources are used when data is not available in the ECB.

Country coverage: 12 European countries and the United States

Time coverage: 1995–2017

Frequency: Quarterly data from December 1997 to March 2017. Annual data from 1995 to 2016.

13. “Domestic and External Public Debt in Developing Countries”

Authors: Ugo Panizza

Website: http://debt-and-finance.unctad.org/Documents/Discussion-papers/Domestic_and_External_Public_Debt_in_Developing_Countries_PANIZZA_2008.pdf (contact the authors for data)

Description: This database provides data on total public debt (external and domestic). Public debt data is collected from different sources and liabilities included in the definition might differ across countries. Public sector definition and liabilities differ across countries.

Notes for researchers: The database covers 130 countries from 1990 to 2007, but 2006 and 2007 data are either forecasts or preliminary estimates. As a result, the coverage is weak in these two years. The author used the central government debt in most cases, but general government and non-financial public sector debt data is used when the central government data is not available.

Country coverage: 130 countries

Time coverage: 1990–2007

Frequency: Annual

14. “Domestic Debt in Low-income Countries”

Authors: Andrea F. Presbitero

Website: <https://sites.google.com/site/presbitero/homepage/data>

Description: This database provides data on the stock of domestic public debt, collected from various previous works. It covers forty-four low-income countries for the period 1970–2010.

Notes for researchers: The exact definition of domestic debt is very burly. In most cases, it is defined as the total public debt subtracted by public external debt. But the exact definition can vary based on data sources.

Country coverage: 44 low-income countries

Time coverage: 1970–2010

Frequency: Annual

15. “Dates for Banking Crises, Currency Crashes, Sovereign Domestic or External Default (or Restructuring), Inflation Crises, and Stock Market Crashes (Varieties)”

Authors: Carmen M. Reinhart

Website: <http://www.carmenreinhardt.com/data/browse-by-topic/topics/7/>

Description: This database includes five series data for a variety of financial crises: currency crisis, inflation crisis, stock market crisis, sovereign domestic debt crisis, sovereign external debt crisis, and banking crisis. Stock market crashes are included for a smaller set of countries subject to equity price data availability. Finally, the author includes two data series: a yearly tally of crises “varieties” and a dummy variable indicating the year of independence (if applicable). This database is an extension of Reinhart and Rogoff’s earlier work published in 2008 “This Time is Different: A Panoramic View of Eight Centuries of Financial Crisis” <https://www.nber.org/papers/w13882>

Notes for researchers: The database covers crises varieties from 1800 to 2010. Please note that Stock Market Crashes are blank when there are no stock prices in time series. Also, the year of independence is included in the database, if the country went independent before 1800, the whole series will be a column of 1s.

Country coverage: 70 countries

Time coverage: 1800–2010

Frequency: Annual

16. “Debt-to-GDP Ratios”

Authors: Carmen M. Reinhart

Website: <http://www.carmenreinhardt.com/data/browse-by-topic/topics/9/>

Description: The information covers annual data from as early as 1692 for the UK and 1719 for Sweden (depending on the country) to 2010 (updated with the World Bank’s July 2010 Quarterly External Debt Statistics and individual mostly official country sources, as

detailed for public debt). Each country has its own page with the underlying data from multiple sources (with their corresponding full bibliographical references). This source (partially) includes external gross central government debt/exports, total (domestic plus external) gross central government debt/GDP, total (domestic plus external) gross general government debt/GDP, and total (public plus private) gross external debt/GDP.

Notes for Researchers: The coverage of debt data varies from country to country due to data availability. The data source of each year has been included in the database and the compositions of the debt data for each country are also included in the database. Please notice that most of the data series are in percentage to GDP, but there are some series reported in percentage to GNP. This database extends the database extensively documented in Carmen Reinhart and Kenneth Rogoff's 2008 paper "This Time is Different: A Panoramic View of Eight Centuries of Financial Crisis," <https://www.nber.org/papers/w13882>. This paper, and their later 2009 book *This Time is Different: Eight Centuries of Financial Folly*, both contain extensive discussion of previously unexploited resources that allowed, for the first time, the construction of long-dated public debt series which had previously been available only for a few countries. Reinhart and Rogoff use their debt data series in "The Forgotten History of Domestic Debt," <https://www.nber.org/papers/w13946>, (later published with minor revisions in 2011 in the *Economic Journal*, 121 (552), 319–50), as well as in their 2011 paper, Carmen M. Reinhart and Kenneth Rogoff, "From Financial Crash to Debt Crisis," *American Economic Review*, 101, 1676–706. https://scholar.harvard.edu/files/rogooff/files/from_financial_crash.pdf. Importantly, that paper also posted the debt to GDP time series https://scholar.harvard.edu/files/rogooff/files/53_data_0.xls. The data had earlier been posted in 2010. The data set is also used in Carmen M. Reinhart, Vincent R. Reinhart, and Kenneth S. Rogoff, 2012. "Public Debt Overhangs: Advanced-Economy Episodes since 1800," *Journal of Economic Perspectives*, 26 (3), 69–86. <https://www.aeaweb.org/articles?id=10.1257/jep.26.3.69>. The data, including not only debt/GDP Data going back to 1800 but associated interest rate series, is found at <https://www.aeaweb.org/articles?id=10.1257/jep.26.3.69>. Finally, a very early nascent version of the Reinhart–Rogoff debt database is employed in Carmen Reinhart, Kenneth Rogoff, and Miguel A. Savastano, 2003. "Debt Intolerance," *Brookings Papers on Economic Activity*, 1: 1–74. https://scholar.harvard.edu/files/rogooff/files/51_bpea2003.pdf.

Country coverage: 70 countries

Time coverage: 1692–2010 (partial coverage)

Frequency: Annual

17. "This Time Is Different: Eight Centuries of Financial Folly" (Princeton University Press, 2009)

Authors: Carmen M. Reinhart and Kenneth S. Rogoff

Website: <http://www.reinhartandrogoff.com/data/>

Description: The database contains twelve datasets that authors prepared in the publication. It includes world crises indices, crises, debt to GDP ratios, exchange rates, gold standard dates, inflation, silver-based exchange rates, and other related datasets.

Notes for Researchers: This data source also provides all tables, figures, and raw data for the publication. The majority of the data series are updated to 2017. Importantly, the appendix to the 2009 book contains extensive discussion and documentation of sources to facilitate replication and extension.

Country coverage: Varies by dataset

Time coverage: 1800–2017 (Varies by dataset)

Frequency: Annual

18. “Managing the UK National Debt 1694–2018”

Authors: Andrew Scott

Website: <http://users.ox.ac.uk/~exet2581/data/data.html>

Description: The author compiled a bond-by-bond dataset for every individual bond issued by UK government. It provides monthly data series on quantity and market price for each bond from 1694 to 2018. For more details, please refer to the working paper available at: http://users.ox.ac.uk/~exet2581/wp/AEJMacro-2018-0263.R1_Ellison_Scott_manuscript.pdf

Country coverage: United Kingdom

Time coverage: 1694–2018

Frequency: Monthly

Institutional Databases

19. “Debt Securities”

Authors: Bank for International Settlements

Website: <https://www.bis.org/statistics/secstats.htm?m=6%7C33%7C615>

Description: This database covers borrowing activities in debt capital markets. Table C1 provides a summary of debt securities outstanding by sector (financial corporations, non-financial corporations, and general government) and residence (international/domestic markets). Table C2 provides more information on central government debt securities markets, broken down by instrument and maturity. Table C3 is a set of country tables which give the most detailed view on debt securities. It provides data series on net flows and amount outstanding by residence, sector, currency, instrument, and maturity.

Country coverage: Global (157 countries for table C1 and C3, 30 countries for table C2)

Time coverage: 1952–present (partial coverage from 1952 to 1970; better coverage after 1970)

Frequency: Quarterly

20. “Sovereign Default”

Authors: Bank of Canada

Website: <https://www.bankofcanada.ca/2018/07/staff-working-paper-2018-30/>

Description: In order to measure the sovereign debt in default, the Bank of Canada has developed a comprehensive database of sovereign defaults. This database includes the total debt in default by creditor (IMF, IBRD, Paris Club, private creditors, FC bank loans, FC bonds, LC debts) and by debtor (advanced economies, emerging/frontier markets, HIPC countries).

Country coverage: 145 countries

Time coverage: 1960–2017

Frequency: Annual

21. “Debt securities issuance and service by EU government”

Authors: European Central Bank (ECB)

Website: <http://sdw.ecb.europa.eu/reports.do?node=1000003848>

Description: This report provides debt securities issuance and service statistics for the euro area and individual EU Member States. Data is further broken down by maturity,

interest rate type (Fixed/Floating) and currency denomination (Euro/USD/GBP). More detailed security-by-security information is also available in the “Centralized Securities Database” (https://sdw.ecb.europa.eu/browseExplanation.do?org.apache.struts.taglib.html.TOKEN=63c99637c7e920605bc134df7c4ba161&df=true&ec=&dc=&oc=&pb=&rc=&DATASET=0&removeItem=&removedItemList=&mergeFilter=&activeTab=SHS&showHide=&MAX_DOWNLOAD_SERIES=500&SERIES_MAX_NUM=50&node=9691594)

Country coverage: 28 EU countries

Time coverage: 2016–Present

Frequency: Annual; Quarterly/Monthly data available from 2018

22. “Living with Debt: How to Limit Risks of Sovereign Finance?”

Authors: Inter-American Development Bank (IDB)

Website: <https://data.iadb.org/Datacatalog/Dataset#DataCatalogID=7cm5-ndt4>

Description: This database reports, in percent of GDP, primary deficit, interest payments, gross public debt, domestic public debt, external public debt (broken down further official and private creditors). It also reports, as a share of gross public debt, debt denominated in foreign currency and local currency.

Country coverage: 26 Latin-American countries

Time coverage: 1980–2013

Frequency: Annual (partial coverage)

23. “Standardized Public Debt Database”

Authors: Inter-American Development Bank (IDB)

Website: <https://data.iadb.org/Datacatalog/Dataset#DataCatalogID=3bvi-edbq>

Description: This database contains more than 190 public debt-related series. Among the more important variables are debt maturity, bank loans, debt issued in foreign/domestic currency, exchange rates, external/internal legislation debt, etc.

Note for researchers: The time coverage of the database is from 2006 to 2016, but 2006–2008 data are annual data, and semi-annual data are available from 2009 to 2016.

Country coverage: 26 Latin-American countries

Time coverage: 2H2006–2H2016

Frequency: Semi-annual

24. “Fiscal Monitor (FM)”

Authors: International Monetary Fund (IMF)

Website: <https://www.imf.org/en/Publications/FM/Issues/2019/03/18/fiscal-monitor-april-2019>

Description: The Fiscal Monitor surveys and analyzes the latest public finance developments. It updates fiscal implications of the crisis and medium-term fiscal projections and assesses policies to put public finances on a sustainable footing. This database provides country specific data and projections for key fiscal variables (including public gross financing needs on table 1.3 and table 1.4). More data series are available from table A4 to table A25. More historical data are available from IMF Data Mapper (<https://www.imf.org/external/datamapper/datasets/FM>)

Country coverage: 115 countries (partial coverage based on data availability from country desks)

Time coverage: 2010–Present

Frequency: Annual

25. “Global Debt Database”

Authors: International Monetary Fund

Website: <https://www.imf.org/external/datamapper/datasets/GDD>

Description: The database covers 190 countries worldwide, including advanced economies and emerging markets economies, and contains total gross debt information on private, household, non-financial corporate, central government, general government, non-financial public sector, and public sector.

Notes for Researchers: The coverage of debt data varies from country to country due to data availability. For certain sectors, such as the private sector, researchers have the flexibility to pursue for a longer time series (with a narrower definition which only includes debt securities and loans) or a wider definition of debt (includes all instruments) but with shorter time series.

Country coverage: 190 countries

Time coverage: 1950–2017 (partially covered)

Frequency: Annual

26. “International Financial Statistics (IFS)”

Authors: International Monetary Fund (IMF)

Website: <https://data.imf.org/?sk=4C514D48-B6BA-49ED-8AB9-52B0C1A0179B>

Description: IFS provides several high-level debt related data series, namely: overall external debt (stock and flow); overall debt position by sector (government; central bank; depository corporations; other depository corporations; other financial corporations; nonfinancial corporations). Some high-level debt holder information is also available for certain countries. (e.g. central bank liabilities to other depository corporations). But data availability varies by country.

Country coverage: Global (most IMF member countries)

Time coverage: 2000–Present

Frequency: Annual/Quarterly/Monthly

27. “Public Sector Balance Sheet (PSBS)”

Authors: International Monetary Fund (IMF)

Website: <https://data.imf.org/psbs>

Description: This database provides comprehensive estimates of public sector assets and liabilities for 38 countries. This database is compiled largely based on IMF’s Government Finance Statistics database and Monetary and Financial Statistics database. Where these data fail to cover all categories of assets and liabilities, they are complemented by other data reported by statistical authorities at the national level, other international organization or staff estimates. Data is reported in both national currency and percent of GDP.

Country coverage: 38 countries

Time coverage: 2000–Present

Frequency: Annual

28. “World Economic Outlook (WEO)”

Authors: International Monetary Fund (IMF)

Website: <https://www.imf.org/external/ns/cs.aspx?id=28>

Description: WEO provides several overall public debt related data series, namely: general government gross debt (by domestic currency/foreign currency); general government debt service; general government gross debt as a percent of fiscal year GDP; general government net debt; general government net debt as a percent of fiscal year GDP. WEO only provides

high-level government debt data. It does not have further information on private debt, debt holder information, etc.

Country coverage: Global (most IMF member countries)

Time coverage: 1980–present (Partial coverage from 1980 to 2000; most countries covered after 2000)

Frequency: Annual

29. “General Government Debt”

Authors: Organization for Economic Co-operation and Development (OECD)

Website: <https://data.oecd.org/gga/general-government-debt.htm>

Description: This database provides data series on general government debt-to-GDP ratio. It also covers a wider range of data series on government finance, such as spending (by central/general government), revenue, deficit, production cost.

Country coverage: OECD countries

Time coverage: 1995–2017

Frequency: Annual

30. “International Debt Statistics (IDS)”

Authors: World Bank (WB)

Website: <https://datacatalog.worldbank.org/dataset/international-debt-statistics>

Description: IDS is one of the most detailed databases concerning about external debt. It includes over 200 time series. It provides detailed information on debt outstanding, debt service, currency composition, creditors, terms, interest, amortization, arrears, etc. It provides a relatively comprehensive picture of countries’ external debt with a very granular level of breakdowns. Other than debt data, IDS also includes data series about balance of payment and major financial indicators.

Notes for researchers: This database has a focus on emerging and low-income countries; most advanced countries are missing from this database. This database also does not have any information on domestic debt.

Country coverage: Global (mostly low- and middle-income countries)

Time coverage: 1970–2016

Frequency: Annual

31. “Quarterly External Debt Statistics (QEDS)”

Authors: World Bank (WB) & International Monetary Fund (IMF)

Website: <http://datatopics.worldbank.org/debt/qeds>; [http://databank.worldbank.org/data/reports.aspx?source=quarterly-external-debt-statistics/sdds-\(new\)](http://databank.worldbank.org/data/reports.aspx?source=quarterly-external-debt-statistics/sdds-(new))

Description: This database aims to provide quarterly data on breakdowns of the total gross external debt position by sector, maturity, and instrument. Classifications and definitions are in line with the Guide for Compilers and Users (2013 EDS Guide) and Sixth Edition of Balance of Payments and International Investment Position Manual (BPM6). Data are published individually by countries that subscribe to the IMF’s Special Data Dissemination Standard (SDDS). Other than the core set of data series, countries are also encouraged to provide data on domestic-foreign currency breakdown; forward debt service schedule, and principal and interest payments due in one year or less. But coverage for those data series varies by country.

Country coverage: 40 developing and low-income countries

Time coverage: 1998Q1–Present

Frequency: Quarterly

32. “Quarterly Public Sector Debt (QPSD)”

Authors: World Bank (WB) & International Monetary Fund (IMF)

Website: <https://datacatalog.worldbank.org/dataset/quarterly-public-sector-debt>

Description: This database aims to provide detailed quarterly data on breakdowns of public sector debt position by sector (General government; Central government; Budgetary central government; Nonfinancial public corporations and Financial public corporations), maturity and instrument. The database is updated quarterly and within one month of the end of a quarter. The participation of countries in this centralized database is voluntary and data coverage varies by country.

Country coverage: 40 developing and low-income countries

Time coverage: 1995Q1–Present

Frequency: Quarterly

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