As its title suggests, this book is intended as an introduction to the theory of fiscal sustainability and the practice of fiscal sustainability assessment. In this introductory chapter I describe the origins of the book, its motivation, its purpose, its intended audience, the contributors, as well as providing an overview of the book’s contents. I also address intentional omissions from the book.

Over time, the need for a book on fiscal sustainability analysis became apparent to the membership of the World Bank’s Quality of Fiscal Adjustment Thematic Group (QFA TG). Fiscal sustainability has become a prominent issue in developing countries, and fiscal sustainability assessments have become an increasingly demanded component of macroeconomic analysis at the World Bank. Unfortunately, there was no single basic source of information on fiscal sustainability. Country economists new to fiscal sustainability analysis could rely on sample work by other economists at the Bank, and could delve into scattered journal articles for the theoretical background. Frequently, however, work on fiscal sustainability analysis would be done by a hired expert, either from the Bank’s research group (DECRG) its Poverty Reduction and Economic Management Economic Policy group (PRMEP) or by an outside academic.

I took over leadership of the QFA TG in 2001 upon joining PRMEP. At that time, fiscal sustainability analysis was identified as a core area in which PRMEP should provide leadership and support to economists working in the regional departments at the World Bank. The membership of the QFA TG—which, despite its title, discusses a wide range of fiscal issues—agreed. It was agreed that the best way the PRMEP group could provide this leadership and support was through training. To support that training I embarked on

*Duke University and NBER.*
a project to provide pedagogical resources on fiscal sustainability analysis. Those resources have come together in the form of this book.

1. Purpose

To those unfamiliar with fiscal sustainability analysis, it is, at its core, the use of a simple set of tools to analyze the government’s budget and its debt position. In its simplest form, this analysis leads to conclusions about the appropriateness of fiscal policy, often characterized in terms of the balance between revenue and expenditure given the government’s debt level. As I hinted above, many World Bank economists are familiar with fiscal sustainability analysis, as fiscal sustainability analysis has long been an important part of the Bank’s Economic Sector Work (ESW). On the other hand, for those less familiar with the subject there is no single reference work that explains it. The main purpose of this book is to fill that gap.

2. Audience

As is standard with any reference text, I should describe this book’s intended audience. First, consistent with its original purpose, the book will serve as an integral part of PRMEP’s regularly offered training courses in fiscal sustainability at the World Bank. These courses are aimed at those economists previously unfamiliar with fiscal sustainability analysis who need an understanding of it in their daily work. Second, the book serves as a useful reference work for all economists. A number of handy and standard formulas are presented in the book. Furthermore, many worked out examples are presented and can easily be replicated for other countries with sufficient data availability. Third, I hope that this book helps build a greater understanding of fiscal policy, and the constraints faced by policy makers. In particular, since many of these constraints are dynamic, a better understanding of fiscal sustainability by economists in developing countries might lead to greater pressure for better fiscal policy in these countries. Finally, I should point out that this book is not aimed at a research audience already familiar with the theoretical concepts described herein. Most of the theoretical discussion in this book is neither new, nor particularly advanced. Rather, the book collects pre-existing work into a single volume, accessible to economists with either an advanced undergraduate or basic graduate level of training.
3. Overview

Themes  The book’s contents are organized around three themes: (i) basic theory and tools for everyday use, (ii) the effects of business cycles on public finance and the role of fiscal rules, and (iii) crises and their impact on fiscal sustainability.

The first theme is central to the book’s purpose of bringing the basic theoretical literature together, along with a set of examples used to illustrate particular methods of analysis. The second and third themes develop the topic of fiscal sustainability further, by extending it to two topics that have been at the forefront of policy discussions in the past 10 years.

Omissions  In its choice of themes some important topics are omitted or are not fully dealt with. Among these, to name a few, are: (i) a broad discussion of contingent liabilities, (ii) debt management, (iii) a complete discussion of the sustainability of a country’s external position, (iv) the role of uncertainty, and (v) fiscal federalism.

In the case of contingent liabilities, this book does touch on the subject under the theme of crises, where the role of contingent liabilities in the financial sector is explored. However, the discussion is far from complete. Fortunately, there is an earlier World Bank-sponsored volume by Brixi and Schick (2002) which delves into the topic in considerable detail.

Similarly, one might have expected to find a chapter or two on debt management in a volume on fiscal sustainability. The government’s debt portfolio implies risk, in the sense that future government outlays for debt service, expressed in real terms, depend on future realizations of uncertain variables. Debt managers deal with this risk, which clearly has implications for fiscal sustainability loosely defined as the government’s ability to meet its current and future obligations. Rather than discuss debt management, however, I have instead chosen to treat it as a specialized topic of its own, largely because there is an existing World Bank-sponsored volume by Jensen and Wheeler (2004) devoted to the subject.

The main focus of this book is on fiscal sustainability, i.e. the sustainability of the government’s finances, rather than external sustainability, which deals with a country’s current and capital accounts, and its external debt position. While Chapter 4, which describes measures of vulnerability, touches on the issue of external sustainability, this is a subject unto itself which should have its own volume.

Contingent liabilities are spending outlays that can arise in the future depending on uncertain outcomes. These liabilities can be explicit or implicit, whereas debt management
deals with uncertainty related to the government’s explicit liabilities. But uncertainty has more general implications for fiscal sustainability, because revenue and expenditure (other than on debt service and contingent liabilities) both lack perfect predictability. Some chapters in the book address aspects of uncertainty, but it is not treated comprehensively. Partly this is a function of the fact that the literature on uncertainty in fiscal sustainability analysis is currently evolving.

Finally, an important and nascent topic in fiscal sustainability analysis is fiscal federalism. This topic has relevance both for currency unions, in which monetary policy is centralized but fiscal policy is locally controlled subject to rules, and for countries with large and influential state governments. Again, the literature on this topic is active and evolving, and the subject matter could easily fill its own volume. Chapter 7 briefly discusses some of the relevant issues in its discussion of fiscal rules, but it is not discussed here in any further detail.

**Basic Theory and Tools** Chapter 2 begins by defining what we mean by *sustainability*. The term suggests something akin to solvency. But we should be more precise. If a government is literally insolvent, this, presumably, implies that it is currently unable to service its debt. Determining whether a government is solvent or not, in that case, is trivial. We can simply look to see whether the government is, or is not, defaulting on its debt. The concept of insolvency which we use here, on the other hand, refers to the government’s inability to indefinitely maintain its current policies while avoiding default now or in the future. One aspect of fiscal sustainability analysis, therefore, is the assessment of whether a government is insolvent, in this particular sense of the word.

To perform basic fiscal sustainability analysis specific theoretical tools are needed, and these are discussed in Chapter 2. It introduces mathematical representations of the government budget constraint, as well as what is usually referred to as the government’s lifetime budget constraint. Chapter 2 discusses the relationship between these concepts and the fiscal theory of the price level.

Chapter 2 uses the basic theory of the government budget constraint to derive results from the early literature on the effects of government budget deficits, and monetary and fiscal policy coordination.\(^1\) These results are important and helpful in interpreting the results of fiscal sustainability analysis. First, budget deficits need not be inflationary. Whether they are or not depends on how they are financed over the government’s lifetime, as opposed to

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\(^1\)In particular, the chapter describes the results of Sargent and Wallace (1981), and Sargent (1983, 1985).
how they are financed in a particular period. Second, primary deficits that are not paid for by running primary surpluses in the future must inevitably lead to inflation or default. Third, lack of coordination of fiscal and monetary policy can lead to perverse outcomes, in the sense that a “tough” monetary authority can, through its actions, cause worse inflation outcomes if its actions are not coordinated with the fiscal authority.

Chapter 3 uses the theory described in Chapter 2 to derive simple tools for conducting fiscal sustainability analysis, and illustrates these tools using a number of different examples. It begins by introducing the long-run fiscal sustainability condition, which is a steady-state version of the government’s lifetime budget constraint. This condition describes the size of primary surplus the government must run to maintain solvency given a particular degree of indebtedness, and given other assumptions about policy and the economy. A government often has fiscal goals other than mere solvency. An additional tool which describes the size of primary surplus needed to achieve a debt target within a particular time-frame is also described. This tool is illustrated using a small case study of Bulgaria, which is targeting a level of debt suitable for entry into the EU and adoption of the euro as its currency.

Chapter 3 also introduces the concept of debt dynamics, a tool which is used to understand the evolution of a country’s debt stock over a historical interval of time. This tool is illustrated using case studies of Argentina and Turkey, and, in practical applied work, is helpful in extracting lessons about policy coordination from the data. Debt dynamics show how the debt-to-GDP ratio is affected by real interest rates, exchange rate volatility, recessions and expansions, as well as fiscal and monetary policy. Debt dynamics are also useful in making forward looking projections that can be used to assess risks faced by a government stemming from its debt portfolio.

Finally, Chapter 3 discusses issues in the measurement of debt. In particular, since much of the theoretical literature concentrates on examples in which debt is real, is rolled over period-by-period, and pays a constant real rate of interest, the chapter discusses which measure of debt—book or market value—is most relevant for which type of analysis.

Chapter 4 also focuses on the measurement of debt levels. It describes the various types of debt instruments governments may have, and how they are valued. It then turns to a discussion of the various debt indicators that are used in relatively casual assessments of sustainability or macroeconomic vulnerability. These include a variety of debt and debt service ratios which are designed to capture a government’s, or in some cases a country’s,
vulnerability to solvency or liquidity problems.

**Business Cycles and Fiscal Rules** Chapters 5, 6 and 7 turn to one of the two main sub-topics discussed in the book: business cycles and their effects on the government’s budget. Chapter 5 discusses cyclical-adjustment of measures of the government’s budget balance. It describes the motivation for these adjustments, which is to identify what might be regarded as the *discretionary* component of fiscal policy. Modern tax systems imply that tax revenues are procyclical, since significant portions of the tax base, such as private income and personal consumption, are procyclical. Similarly, modern transfer programs tend to imply increased outlays during recessions so that a portion of government expenditure is structurally countercyclical. These two facts imply that the budget balance has a natural tendency to move procyclically. One interpretation of this fact is that standard measures of the government’s budget balance will tend to overstate the health of fiscal policy during expansions and understate it during contractions, hence the desire to adjust the budget balance for these effects. Chapter 5 shows that these adjustments have a theoretical motivation within the context of traditional Keynesian macroeconomic models.

Cyclicality of the government’s budget relates to fiscal sustainability once we broaden the topic to include not only issues of government solvency, but also issues relating to the optimality or desirability of particular government policies. In particular, we can ask questions such as: Are the automatic stabilizers a government has in place sufficient? Does discretionary fiscal policy in a country help to dampen business cycles, or does it tend to exaggerate them?

Chapter 5 describes the various methods that have been proposed for cyclical adjustment of the budget balance. These involve four steps. First trends and cycles in measures of aggregate activity must be identified. Second, those components of the budget data that should be regarded as being structurally sensitive to the business cycle must be identified, and decomposed into trends and cycles. Third, the contemporaneous relationship between the cyclical components of real activity and the relevant budget data must be estimated. Finally, the budget data are “corrected” using the relationship identified in the third step.

Chapter 6 illustrates the tools described in Chapter 5 using a detailed case study of fiscal policy in Mexico between 1980 and 2003. Since World War II, fiscal policy in industrialized countries has evolved to the point that it is viewed as *leaning against the wind*. This is for two reasons. First of all, automatic stabilizers—taxes tied to the level of real activity and
transfers that are countercyclical—have become more important. In Keynesian models this implies a smaller multiplier mapping from changes in autonomous expenditure to output. Second, governments have attempted to use discretionary fiscal policy for countercyclical purposes. But in developing and industrializing countries, fiscal policy has not evolved in the same way, as automatic stabilizers have tended to be weaker and discretionary policy procyclical. Mexico serves as an interesting case study of this phenomenon.

Chapter 6 uses detailed fiscal data from Mexico to cyclically adjust the consolidated public sector’s budget balance using the techniques outlined in Chapter 5. It characterizes Mexico’s automatic stabilizers, which prove to be quite weak, and the discretionary component of Mexico’s budget balance, which over the sample period was countercyclical; i.e. fiscal policy was procyclical. During expansions Mexico tended to run discretionary deficits, while during recessions it tended to run discretionary surpluses. While this tended to exaggerate Mexico’s business cycles, Chapter 6 concludes that fiscal shocks did not play a primary role in driving real activity.

Chapter 7 discusses an emerging policy tool for dealing with procyclical fiscal policy: a fiscal rule. Fiscal rules have been introduced by governments for a number of different reasons. To enhance the government’s credibility and consolidate its debt, to ensure long-run fiscal sustainability (solvency), to minimize externalities among members of a federation and to deal with any procyclical bias in fiscal policy.

Chapter 7 describes fiscal rules generally, and then turns to a discussion of Chile’s fiscal rule, which was adopted in 2000, mainly to deal with a perceived procyclical bias in fiscal policy. The chapter describes the details of Chile’s fiscal rule, which sets a target for the structural (or cyclically-adjusted) surplus at 1 percent of GDP. It also discusses the implementation of the rule, and a preliminary assessment of its impact on the Chilean economy.

**Crises and Fiscal Sustainability** The final section of the book deals with crises, which we can think of as the natural consequence of unsustainable policies on the part of the government. Above, we saw a simple definition of fiscal sustainability, which referred to the government’s ability to maintain its current policies and satisfy its lifetime budget constraint without defaulting on its debt obligations. Chapter 8 explores a closely-related issue: the sustainability of a fixed exchange rate regime. This chapter shows how we can think of the sustainability of a fixed exchange rate as being dependent on the government’s ability to
satisfy its lifetime budget constraint without reliance on inflation-related revenue.\textsuperscript{2} Thus, the sustainability of a fixed exchange rate requires a stronger restriction on fiscal policy than the one required for mere fiscal sustainability.

In a simple model related to those described in Chapters 2 and 3, Chapter 8 shows that a fixed exchange rate regime must eventually collapse if the government’s initial debt exceeds the present value of its future primary surpluses. It also shows that the government’s initial debt and its current deficit are insufficient indicators of the likelihood of a fixed exchange rate regime’s collapse since this can be the consequence of (i) ongoing deficits (which are readily observable) or (ii) prospective deficits (that might, for example, stem from an anticipated bailout of a troubled financial system). Chapter 8 discusses how the timing and consequences (for inflation and depreciation) of a crisis depend on the nature of the government’s monetary policy response to the crisis.

The classic model described in Chapter 8 emphasizes a government’s choice, in the face of an unanticipated increase in its expenditure, between explicit fiscal reforms, that would help it control inflation and maintain a pegged exchange rate, and increased seigniorage revenue, which is incompatible with maintaining a peg. In these models, the government finances its additional expenditure by printing more money, and this, in turn, implies that it must abandon the fixed exchange rate, and suffer higher inflation in the future. As many recent crises have demonstrated, this model, while useful, has its shortcomings. In many recent crises, governments facing big increases in their expenditure to bail out failing banks have abandoned fixed exchange rate regimes, have experienced big depreciations of their currencies, but have not dramatically increased seigniorage revenue after the crisis, and have not suffered from high inflation.

Chapter 9 tries to rationalize these findings. It does so by pointing out that the simple model of the government budget constraint used in preceding chapters misses out on important real-world aspects of government budgets. It shows that governments obtain revenue from sources other than explicit fiscal reform and seigniorage revenue. We can think of an explicit fiscal reform as a decision to raise tax rates, or a decision to purchase a smaller quantity of goods and services. But governments also obtain net revenue through implicit fiscal reforms: changes in the value of government revenue and expenditure that are driven

\textsuperscript{2}We should probably think of this as a minimum condition for the sustainability of a fixed exchange rate regime. Other problems faced by the government, such as a liquidity crisis, might also force the abandonment of a fixed exchange rate.
by changes in relative prices rather than by changes in quantities or tax rates. Governments also gain or lose revenue depending on the state of the economy, which they cannot control. By issuing debt in local currency, rather than real debt, governments can also raise implicit revenue if their policy decisions induce a depreciation of the currency.

Chapter 9 takes these aspects of government finance seriously and builds them into the theoretical model of the government budget constraint. It shows how the theoretical consequences of a crisis change with changes in the structure of the budget constraint. With an example calibrated to the experience of Korea in 1997-98, it shows that a simple model of sustainable government finances can rationalize the inflation and depreciation outcomes that have been observed in a recent crisis.

Chapter 9 conducts three case studies of crises in Korea (1997-98), Mexico (1994-95) and Turkey (2001). It shows that in all three cases implicit fiscal reforms were an important factor in government financing after the crisis. The results suggest that focusing on explicit fiscal policy decisions by the governments of these countries would have led a policy analyst to reach incorrect conclusions about the likely consequences of these crises.

4. Contributors

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It is important to highlight that the opinions the authors express in this book are their own, and are not necessarily shared by the organizations with which they are, or have been, affiliated.

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