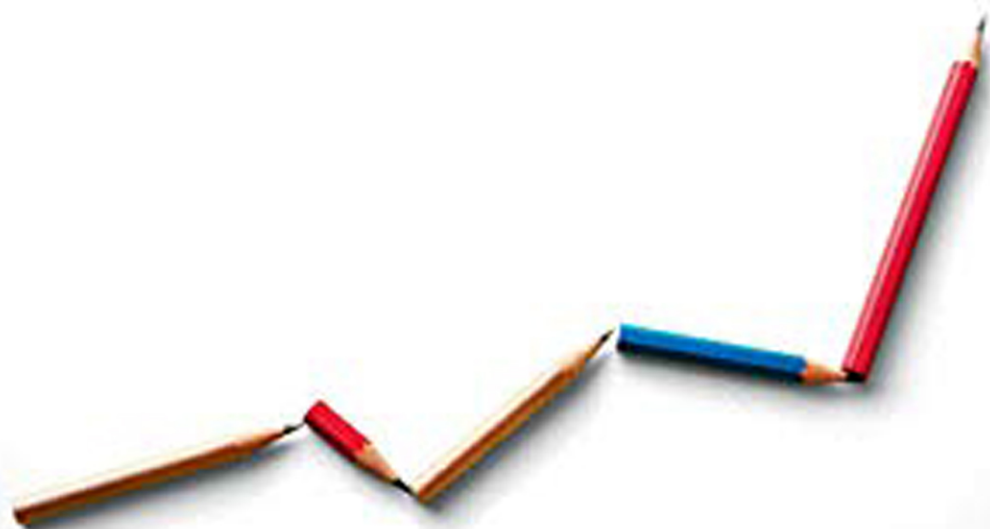


# Macroeconomics for Professionals

A Guide for Analysts and Those  
Who Need to Understand Them



LESLIE LIPSCHITZ  
AND SUSAN SCHADLER



## MACROECONOMICS FOR PROFESSIONALS

Understanding macroeconomic developments and policies in the twenty-first century is daunting: policymakers face the combined challenges of supporting economic activity and employment, keeping inflation low and risks of financial crises at bay, and navigating the ever-tighter linkages of globalization. Many professionals face demands to evaluate the implications of developments and policies for their business, financial, or public policy decisions. *Macroeconomics for Professionals* provides a concise, rigorous, yet intuitive framework for assessing a country's macroeconomic outlook and policies. Drawing on years of experience at the International Monetary Fund, Leslie Lipschitz and Susan Schadler have created an operating manual for professional applied economists and all those required to evaluate economic analysis.

Leslie Lipschitz was an economist at the International Monetary Fund for more than thirty-five years. He served as Director of the IMF Institute, taught at the School of Advanced International Studies at Johns Hopkins University and at Bowdoin College, was a guest scholar at the Brookings Institution, worked and consulted with private financial institutions, and has written, spoken, and published widely on open-economy macroeconomics.

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For Charlotte, Jessica, and Vanessa. After the years of enduring (and sometimes being moved to engage in) ferocious dinner-table debate on issues of political economy, much of what's in this book may seem like old hat.

And for our former colleagues at the IMF who honed our commitment to getting the macroeconomic diagnosis and policy prescription right.





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## Glossary of symbols and acronyms

### Upper and lower-case letters

Except for interest rates (which are always in small-case letters), most variables are written in capital letters for levels of the variable and small letters for growth rates (or percentage changes) or for ratios of variables to GDP. Which of the two is in use for any specific small letter symbol should be explicit in the text or clear from the context.

### Subscripts

g	designates government (as opposed to private)
i	designates one component of an aggregate measure
n	designates a nominal or current price (as opposed to a real or constant price) measure, except when it is used on “P” when it designates the price of nontraded goods
p	designates private (as opposed to government)
r	designates a real or constant price (as opposed to nominal or current price) measure
t, t + 1	designate time periods

### Superscripts

*	designates a target value (e.g., for the inflation rate), a potential value (e.g., for potential output or growth), or a cyclically neutral value (e.g., for the cyclically neutral interest rate, structural, or cyclically-adjusted, fiscal aggregates)
\$	designates that the variable is measured in US dollars

- e designates an expected value. Thus  $E_{t+1}^e$  is the value of the exchange rate expected one period in the future
- d designates domestic variables, such that  $i^d$  is the domestic interest rate and  $D^d$  the stock of government debt in domestic currency
- f designates foreign, such that  $i^f$  is the foreign interest rate and  $D^f$  the stock of government debt in foreign currency
- w designates that a variable is measured in US dollars

### Greek symbols

- $\alpha$  = share of capital in production and income
- $1-\alpha$  = share of labor in production and income
- $\beta$  = share of traded goods in the CPI
- $1-\beta$  = share of nontraded goods in CPI
- $\varepsilon$  = percentage change in the exchange rate, such that a positive number is a depreciation of the home currency
- $\gamma_r$  = the elasticity of revenue to nominal income
- $\gamma_e$  = the elasticity of expenditure to nominal income
- $\pi$  = the aggregate inflation rate (abstracting from the particular price index)

### Symbols and acronyms

- A = TFP = total factor productivity
- ABS = absorption
- ARA = IMF's analysis of reserve adequacy metric
- AT1 = additional tier 1 capital
- BCBS = Basel Committee on Banking Supervision
- BIS = Bank for International Settlements
- BOP = balance of payments
- C = consumption
- CAB = current account balance =  $X - M + NFI + TR$
- CAD =  $-CAB$  = current account deficit of the balance of payments
- CB = central bank loans to the banking system
- CET1 = common equity tier 1 capital
- CiB = currency in banks
- CiC = currency in circulation
- CFM = capital flow management (policies)
- CO = other claims of the banking system (i.e., those on the private nonbank sector). A suffix "i" refers to the central bank, a suffix

“2” refers to the commercial banks, and no suffix is used for the consolidated banking system (or where the context is unambiguous)

CoB	= currency outside banks
CPI	= consumer price index
D	= the stock of government debt or of debt to non-residents (external debt) <sup>1</sup>
DD	= demand deposits
Def	= the overall government deficit (equal to -OB)
DEP	= bank deposits
DI	= depository institutions (chiefly banks) in the accounts of the US Federal Reserve System
DSA	= debt sustainability analysis (whether of public sector debt in Chapter 5 or external debt in Chapter 7)
DSGE	= dynamic stochastic general equilibrium model
E	= exchange rate (domestic currency units per US dollar)
E&O	= errors and omissions (in the balance of payments)
EBA	= external balance assessment
EFA	= the external financial account of the balance of payments
EM	= emerging market country
ER	= excess reserves (i.e., deposits) of the banking system with the central bank
Exp	= government expenditure
F	= forward exchange rate such that $F_t^{t+1}$ is the forward exchange rate for time t+1 quoted at time t
FA	= foreign assets
FB	= foreign balance = X – M
FCL	= Flexible Credit Line of the IMF
FDI	= foreign direct investment
FL	= foreign liabilities
FDD	= final domestic demand = C +IF = TDD – IN
FSAP	= financial sector assessment program (of the IMF and World Bank)
FX	= any financial aggregate denominated in foreign exchange
FXD	= deposits (of residents) in foreign currency
FXH	= foreign exchange holdings of the monetary authorities
GDA	= gross domestic absorption, identical to TDD

<sup>1</sup> We use the same symbols for these two different measures of indebtedness with D referring to public debt in Chapter 5 and to external debt in Chapter 7.

GDP	= gross domestic product
GFSM	= Government Finance Statistics Manual of the IMF
GNDI	= gross national disposable income
GNI	= GNP = gross national income which is sometimes called gross national product
GOB	= gross operating balance, identical to $S_g (= Rev - C_g)$ if $C_g$ <i>excludes</i> capital consumption (i.e., depreciation)
$gr_n$	= the rate of growth of nominal income (that is $\Delta Y_n / Y_{n-t-1}$ )
$gr_r$	= the rate of growth of real income
GS	= government surplus = $S_g - I_g$
GSIBs	= global systemic important banks (generally identical to TITF)
$i$	= nominal interest rate
I	= total investment = $IF + IN$
IF	= fixed investment
IMF	= International Monetary Fund
IN	= inventory investment
IT	= inflation targeting
K	= index of capital inputs into production
KAB	= capital account balance
L	= labor hours worked per period
LI	= Laspeyres Index
LOANS	= net foreign borrowing component of the net financial balance (NFB)
M	= imports of goods and services
M1	= narrow money
M2	= broad money
MAC	= market access country (country grouping including EMs and advanced countries)
MB	= the monetary base (sometimes referred to as reserve money)
MG	= monetary gold holdings
MPC	= monetary policy committee
mpc	= marginal propensity to consume out of income
NAIRU	= non-accelerating inflation rate of unemployment
NCG	= net credit to government. A suffix "1" refers to the central bank, a suffix "2" refers to the commercial banks, and no suffix is used for the consolidated banking system (or where the context is unambiguous)
NDA	= the net domestic assets of the central bank

NDCAB	= non-interest current account balance plus net non-debt-creating financial inflows, all measured in dollars
NFA	= net foreign assets in the monetary balance sheet (FA – FL). A suffix “1” refers to the central bank, a suffix “2” refers to the commercial banks, and no suffix refers to the consolidated banking system (or where the context is unambiguous)
NFB	= net financial balance
NFI	= net factor income from abroad
NIIP	= net international investment position
NOB	= net operating balance, equal to GOB minus capital consumption; identical to $S_g$ ( $= \text{Rev} - C_g$ ) if $C_g$ includes capital consumption
NPI	= net primary income
$O_i$	= gross output of sector $i$
OA	= other short-term assets in foreign currency held by the monetary authority
OECD	= Organization for Economic Cooperation and Development
OIN	= other items net in the balance sheet (defined as an asset). A suffix “1” refers to the central bank, a suffix “2” refers to the commercial banks, and no suffix is used for the consolidated banking system (or where the context is unambiguous). Sometimes OIN is included under a broad conception of NDA
OTH	= other influences on the level of government debt
P	= the price level (when the specific index used is not specified)
$P_i$	= price of value added component $i$ of GDP
$P_n$	= price index of nontraded goods (and services).
$P_w$	= world price index (for a traded good) measured in US\$
$P_y$	= GDP deflator
PExp	= primary expenditure
PGFR	= public gross financing requirement
PI	= Paasche Index
PL	= private credit
PL(DC)	= private credit in domestic currency
PL(FX)	= private credit in foreign currency
PPF	= production possibility frontier
PPP	= purchasing power parity
PRIM	= primary balance



prim	= the primary balance as a ratio to nominal income (that is, $\text{PRIM}/Y_n$ )
PROD	= productivity (output per person-hour)
OB	= overall balance or net lending (defined as $\text{Rev} - \text{Exp}$ )
OEB	= overall external balance
OMC	= US Federal Reserve Open Market Committee
OMOs	= open market operations
$Q_i$	= quantity of value added component $i$ of GDP
QE	= quantitative easing
$r$	= real interest rate
R	= rental cost of capital
REER	= multilateral real effective exchange rate (a weighted index of RERs vis-à-vis a group of countries)
RER	= bilateral real exchange rate
Rev	= government revenue
$rp$	= currency risk premium (this has the dimension of an interest rate) <sup>2</sup>
RPF	= reserve position in the IMF (foreign currency amounts that a member country may draw from the IMF at short notice)
RT	= net foreign exchange reserve transactions of the central bank = reserve loss
S	= gross national saving (comprising private and government components)
SDR	= special drawing rights issued to the country by the IMF or obtained from another country through the IMF
SEI	= seigniorage
TD	= time deposits
TDD	= total domestic demand = $C + IF + IN$ sometimes also referred to as Gross Domestic Absorption (GDA)
TFP	= total factor productivity
TITF	= too important to fail (a class of large, interconnected banks)
TOT	= external terms of trade = $\$/\text{price of export}/\$/\text{price of imports}$
TR	= net transfers from abroad
ULC	= unit labor cost. Lower case used to indicate a rate of change.
UKC	= unit capital cost

<sup>2</sup> E.g.,  $\{(1 + i_{\text{mex } t})/(1 + rp_t)\} - 1$  is the interest rate on Mexican bonds adjusted for the risk premium on the peso.

VAR	= value at risk (a class of models relevant for setting capital adequacy standards)
VAT	= value added tax
W	= wage rate
WEO	= IMF's World Economic Outlook
X	= exports of goods and services
Y	= aggregate output often used when we are not distinguishing between various related output measures (e.g., GDP, GNI, etc.)

## Preface

The business of macroeconomics is essentially practical. It entails analyzing economies usually open to international influences and buffeted by developments at home and abroad. The objective is sensible policy advice or investment decisions. The emphasis in teaching macroeconomics, however, is usually initially theoretical (focusing on the analytic foundations of different models of the economy), and then empirical in the sense of testing models against data. Often even those who have studied macroeconomics are not fully clear on how to apply what they have learned to real-world questions: for example, how do practitioners actually assess the global competitiveness of an economy? What concretely do practitioners mean when they identify an economy as vulnerable to crisis? How do practitioners balance short-term cyclical considerations and long-term sustainability considerations in assessing monetary and fiscal policies?

In our book, *Understanding Macroeconomics*, we aim to help analysts (and those who need to understand them) answer these and many other operational questions. In under 300 pages – including real-world examples, figures, and exercises – we provide a guide to the practical tools of macroeconomic analysis. The text reflects decades of working as economists at the International Monetary Fund (IMF) and subsequent work in the private financial sector, think tanks, and academia. The aim is clear-cut exposition with minimal mathematical complexity.

For many economists the initial material in each chapter will be old hat: definitions of well-understood concepts and details on how to read basic presentations of macroeconomic data. They will be able to move quickly over these parts of the book. However, precision on definitions and an understanding of data catchment systems is essential to the next part of each

chapter: how to parse the data for diagnostic content, assess policies in place, and understand commentary on a government's policy intentions.

The exercises at the end of each chapter relate to frequently encountered real-world problems; they should be manageable given good comprehension of the chapter. However, because they simulate real-world problems, they cannot avoid overlapping with some concepts explained in later chapters. Instructors may decide to assign exercises immediately after each chapter (for a quick assessment of the understanding of key concepts), to postpone assigning some exercises in early chapters until later in the course (to facilitate richer, more complete answers), or to revisit exercises that students found especially interesting or taxing. Those using the book as a self-study guide or reference book can use the exercises to help consolidate the content of each chapter.

### **Online Teaching and Learning Resources**

A companion online workbook volume, available to instructors using the book in their courses, can be accessed at [www.cambridge.org/Lipschitz](http://www.cambridge.org/Lipschitz). Those using the book for reference or self-study can obtain the companion volume by following instructions on the website [www.macroeconomicsforprofessionals.com](http://www.macroeconomicsforprofessionals.com). This volume contains complete answers to all the exercises and three case studies with model answers. The case studies are ideal for helping readers integrate the material presented throughout the book.

Each case study describes an actual country that has faced a macroeconomic crisis or serious economic weakness that readers must diagnose and address. Each presents a narrative on the background to the crisis or issues, a cache of actual data, and an outline for the structure of the analysis that is needed. As in the real world, there is no "correct" strategy; the questions posed have no clear-cut right or wrong answers. What is important is the cogency of the argumentation behind the assessment and advice.

The first case study covers the Latvian financial crisis of 2008, and the exercise is an *ex post* analysis (by a fictional team at the Bank for International Settlements) to cull wisdom from the history on policies that might have forestalled the crisis or lessened its intensity.

The second case study deals with the 2010 sovereign debt crisis in Greece and asks readers to take the perspective of an asset management company with exposure to Greek sovereign debt. This is a fiscal crisis with some unique characteristics. The exercise entails an analysis of the relevant developments and data in order to advise on a strategy with respect to holdings of Greek sovereign debt.

The third case study deals with South Africa in 2013 from the perspective of a fictional consulting team engaged by the government and monetary authorities. No crisis is imminent. However, economic policies confront extreme inequality, dire unemployment, poverty, sluggish output growth, and challenges to longer-term financial stability. Readers are asked to prepare an annotated agenda for a first meeting with the authorities that displays an analytical understanding of the background and an appreciation of the economic and political imperatives.

When the book is used in academic courses, the case studies are useful assignments. The authors have found that having class participants – whether university students or professionals – work in teams, each on one of the case studies, is an excellent end to a course. If the case studies are assigned early in the term, they facilitate in-depth, cooperative team work and provide a specific real-world context for understanding the content of the book.



## CHAPTER 1

# Introduction, Motivation, and Overview

Macroeconomics is ubiquitous and nobody questions its importance. Media commentary on breaking economic data – perhaps the gross domestic product (GDP) and its growth, employment, inflation, or the balance of payments – is almost inescapable. Political campaigns often revolve around starkly conflicting views on exchange rates, movements of jobs across borders, or concerns about government deficits and debt. For a discipline that is called a science, macroeconomics displays a confusing divergence of views on real-world developments.

Understanding economic developments – making sense of the mass of data, debate, and commentary produced every day – is difficult even for experts. It is especially challenging for those whose jobs or studies require that they can critically evaluate macroeconomic developments and policies, who have some university-level training, but who have not had practical experience in economic analysis. Our premise is that reporting and debate on macroeconomics can be made understandable if the underlying issues are placed in a broad analytical framework on which economists generally agree and which has immediate relevance to real-world settings.

The aim of this book is to provide such a framework. It is designed for use in courses on applied macroeconomics or for professionals in finance, management, or government and public policy who need to understand macroeconomics.

The manuscript has been filtered through a variety of professional experiences. The inspiration for it started at the International Monetary Fund (IMF) where we were involved in various ways with answering the question “What analytical tools are essential for assessing a country’s macroeconomic outlook and policies and communicating this assessment in the simplest possible terms?” It evolved through work in the private financial sector with portfolio managers who were highly motivated, severely time

constrained, and focused on opportunities, vulnerabilities, and risks in the countries in which they were investing. It was subsequently reorganized, broadened, and made more accessible in seminars on *Applied Macroeconomics* for Economics majors at Bowdoin College.

Our conviction throughout has been that good macroeconomic analysis requires both an understanding of key conceptual constructs and exposure to real-world situations where positions must be taken and decisions made under uncertainty. In this spirit, the book occupies a somewhat unusual niche: it assumes some familiarity with basic macroeconomic models and does not cover the same ground as most textbooks, it eschews the higher-level mathematics and technical material of current academic debate, and it focuses on the practical application of macroeconomics to frequently encountered situations. Thus, for each segment of macroeconomic analysis addressed, the book summarizes key analytical tools and presents thought experiments and exercises that require readers to make decisions and formulate advice in simulations of real-world situations. At the end of the book, readers should be able to evaluate the assumptions and contingencies on which various positions are founded, and the strengths and weaknesses of alternative policy prescriptions.

A few essential requirements for analysis cut across all of the specific topics addressed in the book:

**Reading the data.** Critical evaluation of real-world developments and policies is impossible without an ability to read the main macroeconomic accounts: the national income accounts as well as the balance sheets and flow accounts of the government, the central bank, the banking sector, and the country as a whole in its transactions with the rest of the world (the balance of payments and the international investment position). Each of these accounts has its own conventions. Once these are understood, the store of data becomes a stepping stone to an appreciation of what is transpiring in and between economies.

**Understanding macroeconomic constraints.** There are many hard-and-fast relationships among macroeconomic variables drawn from the different accounts. In the language of economists, these are the definitional identities and adding-up constraints that discipline analysis, policy prescription, and forecasting. Unlike many behavioral models, these relationships are not contentious, and they are essential to an understanding of the economy.

**Respecting the demands of macroeconomic sustainability.** “Sustainability” (a term that will be used in many contexts through the book) essentially



refers to a configuration of policies and economic developments – typically related to economic growth, inflation, credit expansion, the government budget, and the balance of payments – that does not inherently presage a need for substantial and discontinuous future adjustment. In other words, sustainable policies or developments are those that can reasonably be expected to be steady and predictable in the absence of shocks. Judgments about whether any given set of macroeconomic policies is sustainable must inform all responsible analysis and prescription. Such judgments start with a view of the potential output of the economy – when capital and labor are fully employed but not stretched to a point of continuously rising inflation – which is in a sense the envelope for the macroeconomy. But they also encompass, among other things, the government finances and the external balance of payments accounts. They influence risk premia in financial markets, and they impinge on a wide swath of private and government decisions. At each level, clear methodologies exist for reaching at least qualitative judgments about sustainability. These form another layer of essential constraints on macroeconomic policies.

**Considering policy choices.** Policy options in the face of economic cycles are a theme throughout the book. We include a great deal of discussion of cyclical positions (booms and recessions) and the efficacy of policies aimed at reducing the amplitude of cycles (countercyclical policies). The debate on policy options almost always uses tools – like those for assessing potential output or financial sustainability – that are based on (sometimes heroic) assumptions that need to be examined critically. Our experience is that the political process will almost always drive governments to adopt countercyclical policies, and that such policies can do good. But when they are based on an incorrect reading of the data or on unrealistic objectives, they can be harmful and make the economy vulnerable to crisis.

**Identifying vulnerabilities and crisis triggers.** The policy objective of forestalling economic crises runs through the book. Crises are usually triggered when a shock event exposes a vulnerability in the fiscal or financial system. It is impossible to predict trigger events, but it is possible for policies to make a country's finances more robust and less vulnerable to these shocks. Significant portions of the coverage of monetary policy, government financing, microprudential and macroprudential policies, and risks in a country's macroeconomic interactions with the rest of the world (in Chapters 4, 5, 6, and 7) are motivated by this policy objective.

**Characterizing cross-border economic linkages.** The perspective that runs through the book is global. In all of the presentations of data catchment systems and tools for analysis, we emphasize international economic linkages through both trade and global financial markets – how they must be read in the data and how they constrain economic developments and policies in both large and small countries.

We have sought to create as simple a framework as possible by being ruthlessly selective in what we present while acknowledging real-world complexity. Many of the intense debates among academic economists of different persuasions reflect differences in assumptions about how the agents in an economy (i.e., consumers and investors, workers, managers, owners, and entrepreneurs) respond to market signals and government policies. The arguments are often couched in stylized models that facilitate elegant mathematical analysis. To the extent that we give these debates and models relatively short shrift, it is because a vast academic literature covers these topics but there is less emphasis on the basic analytic prerequisites that lie behind them and are our main focus. The essence of arguments is usually accessible using the tools we provide.

Each of the following six chapters covers one broad area of macroeconomic analysis:

- Chapter 2: the real economy from the perspectives of both potential output and aggregate demand
- Chapter 3: prices, inflation, interest rates, exchange rates, and expectations
- Chapter 4: the monetary accounts and monetary policy
- Chapter 5: the government accounts and fiscal policy
- Chapter 6: financial stability, the financial system, and regulation (including microprudential and macroprudential policies)
- Chapter 7: the external accounts (the flow balance of payments and the stock international investment position)

Each chapter starts by outlining the principal concepts covered and ends with exercises to test comprehension. Analytic and diagnostic techniques are presented with numerous detours to illustrate how they have been used to understand or address actual macroeconomic issues. Throughout the book (and especially the exercises) readers are forced to adopt the perspective of a decision-maker or advisor: they are called upon to diagnose developments and advocate policies or assess opportunities.

A companion online volume provides answers to the exercises and presents three full-length case studies that allow the reader to use the

tools of the main volume to interpret the problems and consider the policy choices in the actual historical circumstances of the case-study countries.<sup>1</sup>

The book is necessarily sequential in its coverage. But it is impossible to discuss demand and supply (covered in Chapter 2) or monetary developments (in Chapter 4) without acknowledging the influence of government operations and international economic relations on them, even though the fiscal and external accounts are only covered fully later in the book. The summary and intuitive treatment of these topics in chapters before they are covered in depth should suffice for the level of analysis required; readers, however, will gain a richer appreciation of some of the material treated lightly in these earlier chapters when they get to the more in-depth subsequent coverage. Also, it is suggested that readers return to some of the exercises in earlier chapters as they progress through the book and become capable of more comprehensive analysis.

Finally, this book is intended as a guide, not an academic treatise or a textbook.<sup>2</sup> Even though the book obviously draws on the broad body of economics literature, we provide few citations or references, limiting these to instances where we have drawn directly from a publication. In the main, the economics behind our analytics is so much a part of the standard curriculum that it defies specific attribution. We are enormously indebted to colleagues at the IMF who over the years taught us most of what we know. We hope we have gotten it right.

<sup>1</sup> This online volume is available without charge. For instructors using the book in their courses, it can be accessed at [www.cambridge.org/Lipschitz](http://www.cambridge.org/Lipschitz). For those using the book for reference or self-study, it can be obtained by following instructions on the website [www.macroeconomicsforprofessionals.com](http://www.macroeconomicsforprofessionals.com). The three case studies cover the Latvian financial crisis of 2008, the crisis in Greece in 2010, and the economic difficulties and policy conundrums in South Africa in 2013. In each the reader is cast in an advisory role and asked to provide advice based on an examination of the relevant data and economic circumstances.

<sup>2</sup> Readers may need at times to refer to one of the widely-used textbooks on macroeconomics. Three excellent options are:

Dornbusch, Rudiger, Fischer, Stanley, Startz, Richard, *Macroeconomics* (12th edition), New York: McGraw Hill Education, 2013.

Mankiw, M. Gregory, *Macroeconomics* (9th edition), New York: Worth Publishers, 2015.  
Mishkin, Frederic, *Economics of Money, Banking, and Financial Markets* (11th edition), Boston: The Pearson Series in Economics, 2016.



## CHAPTER 2

### Real Economic Activity

*This chapter covers the measurement and analysis of a country's aggregate economic activity, a term typically used synonymously with total output. The chapter is concerned with "real" measures and concepts – i.e., measures that do not include changes in prices. Five basic concepts are covered:*

- 1 *The determination of actual and potential output of a country (the difference between the two being critical to policy analysis in subsequent chapters).*
- 2 *Decisions on labor and capital inputs to production (which determine employment and investment and affect international capital flows).*
- 3 *Factors that influence whether output levels across countries converge (i.e., whether poorer countries catch up with richer ones).*
- 4 *The National Accounts data catchment system, and how it can be partitioned in different ways to diagnose demand shocks and help formulate policies.*

A country's aggregate economic activity during any period, its gross domestic product (GDP), can be measured in three ways – as aggregate output (or the supply) of goods and services, as aggregate demand for those goods and services, or as income generated from the production of those goods and services.<sup>1</sup> The critical aspect of GDP is that regardless of which of the three measures is used, it represents the *value-added* produced by the economy.<sup>2</sup>

<sup>1</sup> We use GDP here because it is the most commonly used measure. But, as shown in section 2 of this chapter, alternative broad measures of economic activity may be more appropriate in particular circumstances.

<sup>2</sup> The concept of output in GDP is not gross output but value-added. (The term "gross" in the name refers to the fact that depreciation of capital is not excluded from the measure.) If a manufacturer requires a raw material input to produce output, the contribution to GDP would be only the value-added by capital and labor to that raw material input. If the raw material is produced by domestic mines, its production would be included in GDP as

Although, in principle, all three measures produce the same statement of activity, each provides a different perspective on the underlying influences. This chapter reviews the measurement and conceptual underpinnings of aggregate activity from both the production and expenditure perspectives. While we will frequently use the terms “output,” “production,” and “activity,” these will all refer to GDP. Even those familiar with these concepts should find useful the numerous examples of how they are used in real-world analysis.

Aside from wars and natural disasters, the conditions of supply change relatively slowly. This is why we usually approach secular questions about an economy’s productive potential (i.e., the amount that the country could produce if its labor and capital were fully employed) from the perspective of the production or supply side. Cyclical fluctuations, however, usually originate in demand (i.e., actual expenditure), so much of the discussion about short- to medium-term movements in the real economy centers on the analysis of demand.<sup>3</sup> Over time, demand and potential supply should converge, but they are not identical at any point in time.

Figure 2.1 shows a stylized relationship between *potential output* and *actual output* (which responds quickly to demand). The former tends to follow a trend reflecting the growth of labor and capital inputs and changing productive efficiency. The latter reflects actual changes in demand (which are subject to more frequent shocks) and therefore varies around the trend.

Figure 2.1 shows a business cycle perspective for a roughly 10-year period. In this example, potential growth is a steady 3 percent a year (represented by the slope of the smooth blue line), and actual growth (the changing slope of the red line) varies between a high (during the initial boom years and final recovery years) of 5 to 7 percent per year and a low (during the middle recessionary years) of 0 to –1 percent.

The gap between the actual output line and the potential output line (the “output gap”) defines the business cycle (positive in the boom and early slowdown period and negative in the recessionary and recovery years). When demand exceeds sustainable capacity – so that inventories fall, imports rise, and producers add extra hours for existing employees or hire more workers – changes in prices and other variables usually push demand

the capital and labor value-added in the mining process. If the raw material is imported, it is excluded from GDP.

<sup>3</sup> This is the conventional view. But, as will be seen in later chapters, sudden changes in risk premia, and thus interest rates and exchange rates, may be as much supply shocks as demand shocks.