Modeling Monetary Economies
Fifth Edition

Thoroughly updated and expanded with a new chapter on block chain and increased coverage of cryptocurrency, as well as new data, this established advanced undergraduate textbook approaches the subject via first principles. It builds on a simple, clear monetary model and applies this framework consistently to a variety of monetary questions. Starting with trade being mutually beneficial, the authors demonstrate that money makes people better off, and that government money competes against other means of payments, including other types of government payments. After developing each of these topics, the book tackles the issue of money competing against other stores of value, examining issues associated with trade, finance, and modern banking. From simple economies to modern economies, the authors address the role banks play in making more trade possible, concluding with the information problems plaguing modern banking.

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Modeling Monetary Economies

Fifth Edition

BRUCE CHAMP
SCOTT FREEMAN
JOSEPH H. HASLAG

University of Missouri, Columbia
Joseph H. Haslag: I dedicate this book to Sara. You have been wonderful wife, friend, and sounding board. I am so grateful for your partnership and love.
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Approach

Monetary economics is the branch that seeks to explain how people execute trades with one another. In particular, why would a person be willing to accept a colored piece of paper, willingly giving up something valuable? The answer is compelling.

In this fifth edition, the focus is on how we pay for things. The technical requirements in this book are designed for undergraduates and master-level students. What we see is that a simple model can yield valuable insights. For instance, developments in the distributed ledger technology and cryptocurrencies has positioned the world to trade without colored pieces of paper. Yet, it is quite easy to demonstrate that the distributed ledgers are a means of keeping data that are already encoded in circulating money. In other words, there is a basic equivalency between money and cryptocurrencies that shows how each boils down to means of executing trade.

The backdrop is the overlapping generations models. Money, with a record-keeping friction, expands the set of allocations that a person can acquire during their lifetime. Once this door is open, the student can begin to dig deeper and deeper into the world in which we live. The goal here is to develop a toolkit so that undergraduates can address important questions. After more than 20 years in publication, these models are well within the reach of undergraduates at the intermediate and advanced levels. These elegantly simple models strengthen our fundamental understanding of the most basic questions in monetary economics. How does money promote exchange? What should serve as money? What causes inflation? What are the costs of inflation?

This approach to teaching monetary economics follows the profession’s general recognition of the need to start building the microeconomic foundations. More directly, our observation is that economists explain aggregate economic phenomena as the implications of the choices of rational people who seek to improve their welfare within their limited means. The use of microeconomic foundations makes
macroeconomics easier to understand because the performance of such abstract economic processes as gross domestic product and inflation is linked to something understood by all – rational individual behavior. It brings powerful tools such as indifference curves and budget lines to bear on questions of interest. Finally, the joining of micro- and macroeconomics offers symmetry; instead of studying microeconomics and macroeconomics as independent entities with different tools, there is just economics.

When the first edition of this book was published, inertia and tradition could account for teaching monetary economics as a swamp of institutional details. It was as if monetary economies were only an unchanging set of facts to be memorized. The rapid pace of change in the financial world belies this view. Undergraduates need a way to analyze a wide variety of monetary events and institutional arrangements because the events and institutions of the future will not be the same as those the students learned in the classroom. The teaching of analysis, the heart of a liberal education, is best accomplished by having students learn clear, explicit, and internally consistent models. In this way, students may uncover the links between the assumptions underlying the models and the performance of the model economies and thus apply their lessons to new events or changes in government priorities or policies.

This book implements our goals by starting with the simplest model – the basic overlapping generations model – which we analyze for insights into the most basic questions of monetary economics, including the puzzling demand for intrinsically worthless pieces of paper and the costs of inflation. Of course, such a simple model will not be able to discuss all the issues of monetary economies. Therefore, we proceed in successive chapters by asking which features of actual economies the simple model does not address. We then introduce those neglected features into the model to enable us to discuss the more advanced topics. We believe that this gradual approach allows us to build, step by step, an integrated model of the monetary economy without overwhelming the students.

Coverage

The book is organized into three parts of increasing complexity. Part I examines money in isolation. Here we take the questions of the record-keeping technologies and cryptocurrencies, the demand for fiat money, a comparison of fiat and commodity money, inflation, and exchange rates. In Part II, we add capital, to study money’s interaction with other assets, banking, the intermediation of these assets into fiat money, and alternative arrangement of central banking. In Part III, we look at money’s effects on saving, investment, output, and non-monetary government debt.

The choice of topics to be covered is also difficult. We make no claim to an encyclopedic coverage of every topic or opinion related to monetary economics. We limited coverage to the topics most directly linked to money, covering bank-
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ing (but not finance in general) and government debt (but not macroeconomics in general). We insisted on models with rational agents operating in explicitly specified environments. We also selected topics that could be addressed in the basic framework of the overlapping generations model. In our view, the selected topics are tractably teachable, promoting unity and consistency. We also selected what we best know and understand. We hope that instructors can build on our foundations to fill in any gaps.

To reduce these gaps we added material to examine the 2007 Financial Crisis and the zero lower bound in the fifth edition. Not since the Great Depression has there been such widespread failure among the set of financial institutions. Liquidity and sudden withdrawals played very big roles during this (hopefully) once-in-our-lifetime event. Monetary economics is uniquely situated to develop models that help us understand financial crises. More important, by building models from first principles, we can examine which policies will help when such events occur. We have greatly expanded our presentations of data and have added new exercises.

In addition, we have updated many of the graphs. We have divided the first chapter into two chapters. By doing so, the student is forced to understand money as a means of overcoming a record-keeping friction that exists in the world. To show how money serves this role, it is important to start with a chapter in which money is not needed in an economy with perfect record keeping. Here, intergenerational credit arrangements develop because trading histories are maintained without using up any resources.

Intended Level

The book’s requirements are no more advanced than the understanding of basic graphs and algebra; calculus is not required. (Those who want to use calculus can find an exposition of this approach in the appendix to Chapter 1.) While the book may prove useful to graduate students as a primer in monetary theory, the main text is pitched at the undergraduate level. This has kept us from a few demanding topics, such as nonstationary equilibria; we hope the reader will be satisfied by the wide range of topics we have been able to discuss within a single, simple framework. Material that is difficult but within the grasp of undergraduates is set apart in appendices and can be easily skipped or inserted. The appendices also have many extensions, such as the model of credit, which instructors may wish to use but are not essential to the main topics.

The references display the most tension between the undergraduates and the technical base in which this approach originated. Whenever possible, we reference material written for undergraduates or general audiences; these references are marked by asterisks. Finally, where undergraduate references were not available, we supply references to academic articles and surveys to offer graduate and advanced undergraduates some places to start with more advanced work. This is not intended as a full survey of the advanced literature.
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Potential Course Outlines

Over time and with new editions, the book has grown such that the entire contents cannot be covered in a single semester. Is there a natural way to divide up contents to meet the needs for instructors? Here, two suggestions are made for a semester-length course:

1. For those focusing on deeper treatment of money and banking materials, consider the following outline:
   
   Chapters 1–3 provide the basic structure and application of the model economy. Chapter 4 provides a comparison of barter vs. money and commodity vs. fiat money. Chapters 5 and 6 development topics on domestic monetary policy and an international monetary system. Chapter 8 introduces capital. Armed with an additional store of value, it is possible to develop the role of banking in Chapters 9–13. Then bank risk can be understood in Chapters 14 and 15. This set comprises 14 chapters.

2. For those using the book to study a text aimed at assessing alternative policy settings, consider the following outline:
   
   Chapters 1–3 are essential for developing a basic understanding of the model economy. Chapters 5 and 6 examine how monetary policy actions affect economic outcomes in the domestic and international settings. Chapter 7 introduces the effects of monetary policy based on expectations formed. Chapter 8 introduces capital and the Tobin effect. Chapters 10–13 provide a sense of the role of policy, including how recent institutional developments matter.

3. For a shorter course that uses a microeconomic structure to study monetary and fiscal policies, consider the following outline:
   
   Chapters 1–3 provide the basic structure. Chapters 15–19 study monetary policy and fiscal policy interactions The eight chapters could be adopted for a ten-week (quarter) course.

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Joseph Haslag