PAUL WACHTEL

MACIRONO RICES

FROM THEORY TO PRACTICE



MACRONORICS AND ACCOMMISSION OF THE PROPERTY O

FROM THEORY TO PRACTICE

PAUL WACHTEL

Research Professor of Economics and Department Chairma at New York University, Stern School of Business

McGRAW-HILL BOOK COMPANY

New York | St. Louis | San Francisco | Auckland | Bogotá | Caracas Colorado Springs | Hamburg | Lisbon | London | Madrid | Mexico | Milan Montreal | New Delhi | Oklahoma City | Panama | Paris | San Juan São Paulo | Singapore | Sydney | Tokyo | Toronto

MACROECONOMICS

FROM THEORY TO PRACTICE

Copyright © 1989 by McGraw-Hill, Inc.
All rights reserved.
Printed in the United States of America.
Except as permitted under the United States Copyright Act of 1976, no part of this publication may be reproduced or distributed in any form or by any means, or stored in a data base or retrieval system, without the prior written permission of the publisher.

234567890 DOC DOC 89432109

ISBN 0-07-067613-5

This book was set in Caslon Book by York Graphic Services, Inc. The editors were Elisa Adams and Scott D. Stratford; the designer was Nicholas Krenitsky; the production supervisor was Salvador Gonzales. Project supervision was done by The Total Book.

R. P. Donnelley & Sons Company was printer and binder.

Library of Congress Cataloging-in-Publication Data

Wachtel, Paul.

Macroeconomics: from theory to practice/Paul Wachtel.

p. cm.

Bibliography: p.

ISBN 0-07-067613-5

1. Macroeconomics. I. Title.

HB172.5.W33 1989

339-dc19

88-8027

About the Author

Paul Wachtel is a research professor of economics and department chairman at the New York University Stern School of Business. He has been on the New York University faculty since 1972, shortly after obtaining his Ph.D. from the University of Rochester. His undergraduate degree is from Queens College of the City University of New York. Dr. Wachtel is also a research associate at the National Bureau of Economic Research and the author of the *Outlook* column for *NYU Business*. He has been a visiting economist at the Federal Reserve Bank of New York and a visiting professor at the Hebrew University in Jerusalem.

Paul Wachtel's research interests and publications cut across wide areas of macroeconomics. He has lectured widely on the implementation and effects of monetary policy, on the causes and consequences of inflation and inflation expectations, and on trends in personal saving behavior and capital formation. Recent publications include: "Deficit Announcements and Interest Rates," with John Young, American Economic Review, December 1987; Trade Friction and Economic Policy, edited with Ryuzo Sato, Cambridge University Press, 1987; "The Effects of Inflation and Money Supply Announcements on Interest Rates," with Thomas Urich, Journal of Finance, September 1984; and "Household Savings and Demographic Change: 1950–2050," Research in Population Economics, 1984.

Preface

Macroeconomics is a relatively new subject that has experienced several revolutions and counterrevolutions in its short history. These changes in thinking are more often than not linked to the evolution of macroeconomic problems and policy. Thus, a practical approach that emphasizes empirical analysis and real world developments is the most natural way to study macroeconomics. Although there are any number of textbooks on macroeconomic theory, there is still a distinct need for a text with the practical approach that motivates this book.

The structure of this text differs from that of many of its predecessors, a departure motivated by the desire to provide a context for understanding developments as they occur. I believe that many other texts spend so much time developing theoretical tools that students neither see the connections to the real world nor have the opportunity to apply them. Accordingly, this text presents both the core of macroeconomic theory and some of the tools for understanding empirical analysis before it turns to applied discussions.

The Text's Approach to Macroeconomics

Two major developments in macroeconomic thought in modern times—the Keynesian revolution and the appearance of new classical economics—show clearly how theory and real world influences are closely linked. The Keynesian revolution in macroeconomic thinking occurred when it did for two practical reasons. First, it was a response to the crisis of the Great Depression of the 1930s, which seemed to indicate that massive unemployment could persist indefinitely. Second, the then newly developed measures of aggregate activity—the national income and product accounts—enabled the Keynesians to both analyze the phenomena and develop their policy prescriptions.

The rational expectations or new classical approach, a very recent development in macroeconomic theory, provides a strong theoretical challenge to the Keynesian tradition of policy activism to manage the macroeconomy. The new classical revolution did not occur simply as an abstract theoretical development. Instead it was an attempt to understand why stabilization policy in the 1960s and 1970s was less successful than had been hoped. The new classical approach helps us understand the inherent limita-

tions of forecasting and policy management which stem from the continuous evolution of the structure of the economy.

Our practical approach to macroeconomics suggests that we examine the applicability of theory and evaluate the impact of changes in policy. Empirical macroeconomics accomplishes these tasks, and in this text we explain how econometric modeling provides a formal link between theory and observation. We show how econometric results illustrate the real world implications and lessons of theory. The intent is not to teach econometrics, the specification and estimation of statistical models, but to show what econometric results can teach us about the economy. This is the first text that demonstrates how students can become educated users of econometric results without studying the statistical theory that underlies econometrics.

An understanding of empirical macroeconomics is very valuable because the differences that exist among macroeconomists often do not hinge on the fundamental building blocks of the core theory. Instead they stem from differences in emphasis and interpretation of the empirical phenomenon. The explanations of empirical phenomenon that are found throughout the book help us understand how each theoretical approach works and enables us to evaluate alternative policy recommendations.

An important message that emerges from this text is that macroeconomics cannot provide panaceas and definitive solutions for all economic ills. Different situations require different theoretical analyses and, furthermore, every policy recommendation is subject to uncertainty concerning its outcome. These limitations make macroeconomics a more difficult subject and perhaps at times a confusing one, but ultimately a more interesting one as well. Students will find in these pages the wherewithal to deal with these complexities in an intelligent fashion.

The Audience

This text is aimed at the student who is studying macroeconomics in order to become an educated observer of the economy. It does not set out to provide all the mathematical tools and apparatus that graduate study of economics requires. Nevertheless, I have not shied away from formal explanations when they are useful, and they are preferable to simply making assertions about theory.

The text starts with the basics of macroeconomics but moves into the heart of the subject rather quickly. Thus, it is accessible to students with little or no prior course work but is better suited to students who have had some prior training in an introductory economics course. This text was written for students who want to obtain a better understanding of how the macroeconomy works and what policy can and cannot accomplish. Such students are often found in courses such as:

- Undergraduate courses at the intermediate level with an applied bent for students who may or may not continue their formal studies in economics.
- Courses in master's programs of business schools. MBA students have,

more often than not, had a smattering of economics as undergraduates and are also unlikely to be on their way to becoming professional economists. Nevertheless, an understanding of applied macroeconomics is an important part of their liberal training in business.

Courses on business cycles or forecasting. The distinction between macro theory courses and business conditions/forecasting courses has become increasingly blurred. Modern developments of macro theory have brought renewed interest in what used to be called (in the pre-Keynesian generation) business conditions. Applied forecasting can no longer be taught out of a theoretical context, and our practical approach bridges the gap between courses in macroeconomics and business conditions.

The Organization of the Book

To understand the theory and practice of macroeconomics, we need to explore the tools of empirical macroeconomics. Accordingly, the text begins with chapters on macroeconomic data and business cycle analysis which give the student the intuition to examine real world situations.

The tools of model building are presented only to the extent that they will be usable and helpful in meeting our goals. These tools—Keynesian aggregate demand, *IS-LM* analysis, total supply and demand, and the Phillips curve—are presented in Part 2 of the book, "The Theoretical Core." The core chapters start with the Keynesian revolution and move right through to the new classical approach. The exposition in the core chapters not only develops these tools, but does so in a context that explains the historical evolution of macroeconomic theory and its interaction with real world events.

In Parts 3 and 4 we turn to the practical concerns of macroeconomics. Part 3 is devoted to the formulation, implementation, and effects of macroeconomic policy. Since monetary policy has become increasingly more important in recent years, we take a close look at the financial sector and the way in which monetary policy is made. As a consequence, a number of issues that are often not discussed in other texts are explained, such as the choice between interest rate and money supply policy targets, the channels of supply side policy influence, the long-run effects of deficits, and estimates of the impacts of monetary and fiscal policy changes.

Since macroeconomic policy in recent years is often strongly influenced by international considerations, a chapter on the open economy is included in Part 3. The discussions on open economy in the core chapters were kept to a minimum for the sake of simplicity. In Part 3 we present a full exposition of all the theoretical and policy implications of the open economy, including the role of financial flows in exchange rate determination.

The final part of the text, Part 4, takes a closer look at the individual sectors of the economy. Modern theories of money demand, the labor sector, and consumption and investment demand are presented. These chap-

ters build on some of the intuition presented in the core chapters and provide explanations of the microeconomic foundations of behavior. The micro foundations are presented when they assist in providing an explanation of behavior. For example, various explanations of behavior in the labor sector are presented to show why macroeconomics often assumes that there is some degree of wage rigidity. In addition, these chapters show some empirical results which enable us to estimate important relationships, such as the effect of interest rates on money demand and investment expenditures. Important concepts like the natural rate of unemployment are not simply treated as abstractions but are made operational with specific estimates of their magnitude.

Chapter 18 provides an introduction to the methods and techniques of econometric modeling. Students will learn how models can be used to assist in forecasting and in the analysis of policy changes. Model simulation concepts are explained so that econometric model estimates of the effect of policy changes on the economy are no longer a mystery.

The text concludes with a thorough presentation of the new classical approach (Chapter 19), which has not been thoroughly explained at an elementary level in other texts. Although this is by no means a book that subscribes to the new classical approach, the lessons of this influential school pervade the book. In this chapter the approach is subjected to a rigorous examination. It is left to last because the challenge to macroeconomic thinking provided by the new classical propositions has set the scene for much of the current research in macroeconomics. These include the renewed efforts of macroeconomists to understand why economic fluctuations occur and why inflation and unemployment persist.

Conclusion

Macroeconomics: From Theory to Practice is a text that will provide students with an understanding of how the macroeconomy works, how policy affects the economy, and how economists explain the phenomena that we observe. The text does this by relying on two fundamental pedagogical concepts—the interaction between theory and real world events and the use of empirical evidence to evaluate the implications of theory.

Macroeconomic theory has developed in response to real world conditions and problems. Thus, an understanding of macroeconomic theory requires an explanation of the historical context which gave birth to a particular approach. In addition, an understanding of how the macroeconomy works does not stop with theoretical models; in this book we go on to examine the empirical relationships that connect theory to real world conditions and events.

I believe that students who use this text will emerge from their studies as informed observers of the macroeconomy. When newspaper reports indicate that the Federal Reserve is tightening monetary policy, these students will understand what the Fed is trying to accomplish and why and how it will do so. When the president rails against the Congress for failing to cure its

profligate ways, the student will be able to cut through the rhetoric and understand why a deficit may or may not be desirable and weigh the long-term consequences of the deficit against the short-term consequences of a tax increase in an informed manner. This text provides the wherewithal to examine these questions in a thoughtful manner; it makes macroeconomics operational.

Supplements

For instructors using this text a complete *Instructor's Manual* and *Test Bank* is available, prepared by Professor Jack Adams of the University of Arkansas. It contains an overview of each chapter as well as answers to the questions and problems in the test and also a complete set of test questions to accompany the book. The test questions are available for use with a personal computer.

Two items of particular value to students are the *Study Guide* and Macroeconomic Models Software, both prepared by Professor John Larson of Loyola College. The *Study Guide* offers a summary of each chapter, self-test items, and computer-assisted applications of macroeconomic theory for use with the accompanying software. The software itself provides programmed macroeconomic models that illustrate many important concepts, including the Keynesian cross, *IS-LM* analysis, and total supply and demand analysis. Numeric results and corresponding graphical results are presented in the context of LOTUS 1-2-3, Version 2 format. Hardware requirements are IBM or compatible PC equipped with DOS 2.0.

ACKNOWLEDGMENTS

When I joined the faculty of the Stern School of Business at New York University over 15 years ago, I was aked to teach a new course called Macroeconomics: Theory, Policy, and Forecasting. Although the course that I gave then had very little in common with this book, it started a long evolution of experience in teaching macroeconomics to business school students which led to the development of this text. Thus, my first thanks go to my students at NYU who made this possible. In particular, the book began to evolve from some lecture notes prepared by a group of students some years back, and I would like to express my appreciation to Ruth Dienstag, Uri Lowenstein, Sang Park, Nicholas Travelos, Judith Ugelow, and Eli Weitz.

My friends and colleagues on the NYU faculty—too numerous to name inch dually—have provided me with ideas, challenged my thinking, and offered continuous support and encouragement for which I am very grateful. The value of the personal and intellectual environment which they provide at the Graduate Business School cannot be underestimated. The task of typing, retyping, copying, and recopying many drafts fell to Cheryl Washington, Isabel Baez, and Mary Jaffier, and I appreciate their always cheerful

assistance. Research assistance from Biplab Das, Young Kim, Eric Grubel, and Charles Larson has also been of great help.

The following instructors have provided useful comments at many stages in the writing of this book: David R. Abel, Mankato State University; Jack E. Adams, University of Arkansas; Robert M. Aduddell, Loyola University of Chicago; David Aschauer, University of Michigan; James Barth, George Washington University; Parantap Basu, Fordham University; Michael D. Bordo, University of South Carolina; Eugene A. Brady, Indiana University—Bloomington; Louis P. Cain, Loyola University of Chicago; Alan Deardorff, University of Michigan: Charles Fischer, Kansas State University; Philip Friedman, Boston University; James R. Gale, Michigan Technological University: Edward N. Gamber, Oberlin College; William B. Harrison, Virginia Commonwealth University; James M. Holmes, SUNY-University at Buffalo; Beth F. Ingram, University of Iowa; John Larson, Loyola College of Chicago; Richard Long, Georgia State University; Randall Lutter, SUNY— University at Buffalo; Craig R. MacPhee, University of Nebraska; Andrew Policano, University of Iowa; Richard Rosenberg, University of Wisconsin— Parkside: Carl Uhr, University of California—Riverside; Ike Vandewetering, Iowa State University; David Weinberg, Xavier University; Michael Wiseman, University of California—Berkeley; and William Zahka, Widener University.

Finally and most importantly, I would like to thank my wife Claire and my children Chaim and Rachel for providing both the ambition to complete the project and the distraction that made it so difficult.

Paul Wachtel

Contents

, i	PREFACE	O XVII
	PART 1 PRELIMINARIES	. 1
	CHAPTER 1	
	Introduction	3 4
	Macroeconomics: A Definition	5
	The Development of Macroeconomics What Can Macroeconomics Do?	7
		8
	Our Approach to Macroeconomics	8
	Major Features Structure of the Book	9
		10
	Mathematical Review	10
	Useful Mathematical Tools Introduction to Regression Analysis	12
	CHAPTER 2	
8)	Macroeconomic Measurement: Output and Inflation	15
	The National Income and Product Accounts	17
	Definitions and Concepts	17
	The Formal Accounts	19
	A Simplified Accounting System	22
	Measuring GNP	25
	Real versus Nominal GNP	27
	Price Indexes	27
	Index Number Theory	27
	Major Price Indexes	29
	Consumer Price Index	29
V.	Producers Price Index	31
à	Implicit Price Deflators	31
	Measuring Inflation Rates	31

ix

CH		ъ.	•	_	0	-2
СП	м	•		드	n	3

Business Cycle Analysis	37
The Business Cycle: A Definition	38
What Happens During a Business Cycle?	40
Measuring Business Cycles	43
Cycle Chronology	43
Analyzing Cycles	47
Plotting Cyclical Data	47
Recession and Recovery Analysis	48
Cycle Indicators	52
PART 2	9
THE THEORETICAL CORE	57
	3 :
CHAPTER 4	
Basic Keynesian Theory	61
The Quantity Adjustment Paradigm	62
A Basic Keynesian Model of Aggregate Demand	63
The Multiplier	67
The Keynesian Consumption Function	70
The Algebraic Model of Aggregate Demand	71
Multiplier Examples	73
The Vietnam War Expansion	73
The Post-World War Depression?	74
Modern Consumption Theory	75
An Extension of the Multiplier Model	75
CHAPTER 5	
The Full Keynesian Model of Aggregate Demand	79
Product Market Equilibrium	80
Planned Investment and Interest Rates	81
Deriving the IS Curve	82
Understanding the IS Curve	83
Monetary-Sector Equilibrium	86
Money: A Definition	86
Classical Quantity Theory	87
Demand for Money Function	189
Money Market Adjustments	9. 9 :
Money Market Equilibrium	
Understanding the LM Curve	92
Equilibrium in the Keynesian Model and Policy Analysis	93
Equilibrium Adjustments in the IS-LM Model	9.
Analysis of Fiscal and Monetary Policies	9
Shifts of the IS Curve	9

Cor	

Chille of the LM Comme	98
Shifts of the LM Curve	99
Fiscal Policy Monetary Policy	101
	101
Further Developments of the IS-LM Model The Fiscalist Case	102
The Monetarist Case	102
The Money Substitutes Case	104
Equilibrium and Capacity	105
Appendix: The Slopes of the IS and LM Curves	107
CHAPTER 6	
The Determination of the Drice Level	442
The Determination of the Price Level	0 113
Total Supply and Demand Analysis	115
Total Demand Curve	115
Total Supply Curve	• 117
Keynesian Supply Curve	117
Classical Supply Curve	118 119
Positively Sloped Supply Curve Understanding Wage Rigidity	120
Career Labor Markets	121
Implicit Contract Theory	121
Using Total Supply and Demand Analysis	122
Shifting Supply and Demand Curves	122
Model Equilibrium	123
Timing Considerations	125
Policy Analysis	126
Expansionary Policy	126
Supply Shock	129
More on Long-Run Equilibrium	129
Approaches to Price Determination	130
Classical View	13
Traditional Keynesianism	132
Postwar Keynesianism	132
Monetarism	133
Contemporary Consensus	133
New Classical Approach	134
Remaining Tasks	134
CHAPTER 7	
Expectations and the Persistence of Inflation	139
Dynamic Total Supply Curve	140
The Phillips Curve	142
An Early Application of the Phillips Curve	14
The Phillips Curve Goes Awry	140
Expectations of Inflation in the Phillips Curve	14
The Expectations-Augmented Phillips Curve	148

0

The Long-Run Trade-Off	149
Full Impact of Expectations	151
Changing Views of the Trade-Off	152
A Reexamination of the Data	154
The Intuition Underlying the Phillips Curve	155
The Labor Search Story	155
The Accelerationist Story The Phillips Courses A Supercours	157
The Phillips Curve: A Summary	158
Four Views of the Phillips Curve An Estimated Phillips Curve	158
The Formation of Expectations	160
Expectations Formation and the Phillips Curve	162
Adaptive Expectations	163 164
Rational Expectations	165
Phillips Curve with Rational Expectations	165
The New Classical Macroeconomics: An Introduction	
	166
CHAPTER 8	
Aspects of Inflation	173
The Costs of Inflation	
	174
Inflation-Adjusted Economy Nominal Institutions	175
Unanticipated Inflation	176 177
Inflation Uncertainty	178
Inflation and Interest Rates	180
The Fisher Effect	181
A Reexamination of IS-LM Equilibrium	183
Monetary Policy	184
Coping with Inflation	185
Indexation	185
Price Controls	186
Inflation and Growth in the Postwar United States	187
Sources of Inflation	192
Manatana Grandla	192
Excess Demand	194
Relative Price Shocks	194
Wage-Price Spiral	195
Inflationary Expectations	195
	e L
PART 3	
MACROECONOMIC POLICY	
	201
CHAPTER 9	
Money Creation and Monetary Policy	203
The Banking Business	204

	ite	

Creating Money: Bank Balance Sheets		205
The Structure of the Federal Reserve		207
Money Creation and Monetary Policy		210
Money Multiplier Model		210
The Central Bank and the Money Supply Function		213
Monetary Policy Tools		216
Open Market Operations		218
Discount Rate		218
Reserve Requirements		218
Federal Reserve Policy-Making		219
The Evolution of the Fed's Role		220
Monetary Policy Procedures		221
Policy Targets		0 221
October 1979 and Its Aftermath		222
Selecting a Target		223
Monetary Policy Case Studies	•	225
Monetary Policy in 1982		225
Monetary Policy in 1986		227
CHAPTER 10		
Fiscal Policy and the Debt		233
Demand Management Policy		234
Policy Instruments		234
Formulating Fiscal Policy		236
Measuring Fiscal Policy		237
Deficits and the Debt		239
Crowding Out		240
Long-Run Effects of Deficits		243
Budget Trends		245
An Analytic Model of Crowding Out		247
Supply Side Policy		252
Supply Side Channels		252
Tax Changes in the 1980s		254
CHAPTER 11		
Macroscoponio Dalianina One T		
Macroeconomic Policy in an Open Economy		261
A Keynesian Approach to the Open Economy		263
Multiplier Model		263
Exchange Rates		265
Exchange Rates in the IS-LM Model The Balance of Payments		267
The Balance of Payments The IS-LM-BP Equilibrium		268
Capital Mobility		272
		275
Price Flexibility and the Open Economy		278
Supply, Demand, and the Trade Balance		278
Goods Mobility and PPP		282

xiii

0

Financial Asset Flows in an Open Economy	284
Maintaining International Economic Order	286
CHAPTER 12	
The Effects of Policy	293
Policy Effects and Econometric Models	294
Effects of Fiscal Policy	295
Fiscal Policy Multipliers	295
Comparing Monetary and Fiscal Policy	299
Effects of Monetary Policy	300
Anecdotal Evidence	301
Reduced-Form Evidence	302
Model Simulations	304
CHAPTER 13	
The Monetarist Approach	307
Roots of Monetarism	308
Keynesians versus Monetarists Elements of Monetarism	309
Theoretical Issues	311 312
Transmission Mechanism	312
Theory of Nominal Income	313
Inflation as a Monetary Phenomenon	314
Policy Issues	314
Importance of Monetary Aggregates	314
Uniqueness of the Transactions Asset	315
Preference for Money Growth Rules	317
The Choice of Policy Targets	319
Interest Rates or Money?	319
Which Money Aggregate?	320
PART 4	
A CLOSER LOOK	
	327
CHAPTER 14	
The Demand for Money	329
A Definition of Money	330
Conceptual Approaches	330
Formal Definition	331
Keynes on Money Demand	333
Speculative Demand	335
A Formal Derivation	335
Liquidity Trap	338
Contemporary Money Demand Theory	340

Con	

Inventory Model for Transactions Demand Portfolio Model	340 342
Empirical Estimates of the Demand for Money	345
Functional Form for Money Demand	345
Data and Estimation	346
Interpretation of the Estimates	347
CHAPTER 15	
The Labor Control	
The Labor Sector	353
The Labor Market in Keynesian Theory	354
The IS-LM Classical Synthesis	356
Critique of the Labor Market Model	358
Labor Market Behavior	359
Do Wages Lag?	359
Labor Market Concepts Evaluating the Unemployment Rate	· 361
The Natural Rate of Unemployment	365
Calculating the Natural Rate Estimating the Natural Rate	365 366
Estimating the Natural Nate	300
CHAPTER 16	
The Consumption Sector	373
Defining Consumption	374
Modern Consumption Theories	375
The Life Cycle Hypothesis (LCH)	376
The Permanent Income Hypothesis	379
The PIH: An Econometric Application	384
Implications of LCH and PIH Approaches	386
Consumption and Tax Changes	386
Consumption and the Stock Market	388
The Wealth Effect in Macroeconomic Theory	389
CHAPTER 17	
Investment and Growth	395
Components of Investment	396
Theoretical Models of Investment	397
Accelerator Model	398
Multiplier-Accelerator Interaction: An Example	400
Neoclassical Model	401
Empirical Investment Functions	404
Macroeconomic Policy and Investment	409
Growth and Productivity	412
Definitions	412
Productivity Trends	412