Hall and Taylor's



STUDY GUIDE SECOND EDITION

DAVID H. PAPELL

Study Guide Hall and Taylor's MACROECONOMICS

Second Edition

David H. Papell University of Houston



W.W. Norton and Company
New York London

Acknowledgments

At all stages of writing the study guide, I have benefited greatly from the editorial comments and suggestions made by Drake McFeely. I am also thankful for the careful review of the problems done by Cheryl Holsey and Stephen Kerman. The feedback on the first edition that I have received from students at the University of Houston and the University of Virginia has been very helpful in preparing the second edition.

Copyright © 1988, 1986 by W. W. Norton & Company, Inc. All rights reserved. Published simultaneously in Canada by Penguin Books Canada Ltd. 2801 John Street, Markham, Ontario L3R 1B4 Printed in the United States of America.

Second Edition

ISBN 0-393-95635-6

W. W. Norton & Company, Inc., 500 Fifth Avenue, New York, N.Y. 10110 W. W. Norton & Company Ltd., 37 Great Russell Street, London WC1B 3NU

34567890

Preface

The purpose of this study guide is to help you learn the material in Hall and Taylor's *Macroeconomics*, Second Edition. It isolates the major learning objectives, reviews the major terms and concepts, and provides self-tests and problem sets for every chapter in the text. A word of caution before you continue, however: the study guide will help you to learn the material more easily, but it is not a substitute for reading the textbook.

Each chapter in the study guide opens with a section called *Main Objectives*, which highlights the basic topics covered in the text chapter. This is followed by a section called *Key Terms and Concepts*, which reviews and explains the chapter's most important concepts. Next comes the *Self-Test*. Here, there are three types of questions: fill in the blank, true-false, and review. You will find answers to the Self-Test at the back of each chapter. Finally, each chapter includes a *Problem Set*, where *Worked Problems* that include step-by-step solutions precede *Review Problems* that you work yourself. Answers to the Review Problems are also found at the back of each chapter.

While every student studies differently, you might use the study guide in the following way. First, read the chapter in the textbook without worrying too much about understanding everything. Second, read the Main Objectives and Key Terms and Concepts sections in the study guide. If you come across a concept that you do not understand, go back to the text. Third, take the Self-Test as if you were taking an exam. Write down your answers, and be sure to provide an explanation for the true-false questions. Refer back to the text or to the study guide to make sure that you understand the questions that you missed. Fourth, work through the Problem Set, using the Worked Problems to learn how to solve the different types of numerical problems. Finally, re-read the chapter in the text to make sure that you understand it completely. You should now be well prepared to answer the questions and problems in the back of each text chapter.

Contents

Preface iv

Part I. F	undame	entals of Macroeconomics
Chapter	1.	The Macroeconomy 3
Chapter	2.	Measuring Economic Performance: Output and Income 13
Chapter	3.	Monitoring the Economy: Inflation and Employment 25
Chapter	4.	Income and Spending 40
Chapter	5.	Financial Markets and Aggregate Demand 53
Chapter	6.	Aggregate Supply and Price Adjustment 68
Chapter	<i>7</i> .	Macroeconomic Policy: A First Look 84
Part II.	The Mi	cro Foundations of Aggregate Demand
Chapter	8.	Consumption Demand 101
Chapter	9.	Investment Demand 115
Chapter		Foreign Trade and the Exchange Rate 126
Chapter		The Government's Budget Deficit and Demand 137
Chapter	12.	The Monetary System 148
Part III.		Aicro Foundations of Aggregate Supply rice Adjustment
Chapter	13.	Aggregate Supply and Economic Growth 163
Chapter	14.	New Classical Theory 175
Chapter	15.	The Theory of Wage and Price Rigidities 187
Chapter	16.	Aggregate Dynamics and Price Adjustment 197
Part IV.	Macro	economic Policy Evaluation
Chapter	17.	Designing and Maintaining a Good Macro Policy 211
Chapter	18.	Macroeconomic Policy in the World Economy 224

PART I

Fundamentals of Macroeconomics



CHAPTER 1 The Macroeconomy

Main Objectives

During the past 15 years fluctuations in gross national product, employment, inflation, and interest rates have been larger and more erratic than at any time since the Great Depression of the 1930s. In order to explain fluctuations in these variables, macroeconomists construct models. Chapter 1 introduces the basic properties and terminology of macroeconomic models.

Key Terms and Concepts

Macroeconomics is the study of economic fluctuations. While the long-run growth of the economy is largely determined by factors such as population growth and technological progress, this growth is irregular. The economy undergoes both recessions, periods of coontracting economic activity, and recoveries, periods of above-average economic growth following a recession. The top of a recovery is a peak and the bottom of a recession is a trough.

Real gross national product (GNP) is the most comprehensive measure of total production in the United States. It adjusts the nominal dollar value of goods produced for changes in prices. The rate of inflation is the percentage change in the average price of all goods in the economy from one year to the next.

The employment rate is the ratio of employed workers to the working-age population. The unemployment rate is the percentage of workers who are looking for work and have not yet found it. The rate of interest is the amount charged by lenders per dollar per year, expressed as a percent. The money supply consists of currency and deposits at banks.

Potential GNP (or potential output) is the amount of output that can be produced from the existing capital stock and labor force. Recessions and recoveries are measured by fluctuations in real GNP from its long-run, or potential, growth path. Other economic variables also fluctuate. Employment is highly correlated with GNP, and therefore falls during recessions. Inflation tends to be higher when the economy is near its peak, and lower when it is in a trough. Interest rates are procyclical; they rise during recoveries and fall during recessions.

Describing macroeconomic behavior in complete detail would prove unwieldy—there is too much going on. So economists construct macroeconomic models, simplified descriptions of how consumers and firms behave and interact, to explain fluctuations. In this way, they can test their theories against observation, or note how different theories interact, without extraneous detail. We pay a great deal of attention in this course to macroeconomic models with flexible and sticky prices. Models with flexible prices assume that wages and prices adjust rapidly according to traditional supply and demand analysis. In this way, workers and machines are kept fully employed, so that the economy always operates at its long-run potential output. Models with sticky prices postulate that this adjustment takes time and explain fluctuations by bottlenecks in the adjustment process.

The model with flexible prices is illustrated in Figure 1-1. The aggregate supply curve is a vertical line that depicts potential output. In Chapter 6 we will see why potential output does not depend on the price level. The aggregate demand curve, which slopes downward, is the total amount of demand throughout the economy. In Chapter 5 we will see how the aggregate demand curve is derived. With flexible prices, changes in aggregate demand affect only the price level. They do not affect GNP.

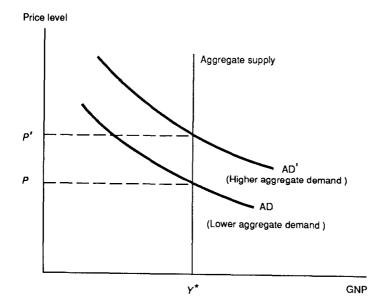


Figure 1-1

According to the model with flexible prices, real GNP can only change if potential output changes. The Great Depression of the 1930s

saw real GNP fall by so much that an explanation based on a drop in potential output seemed inadequate. During the depression, John Maynard Keynes, the great British economist, created a new macroeconomic model, the model with sticky prices, where shifts in aggregate demand could affect GNP. The model with sticky prices is illustrated in Figure 1-2, where the fixed price level is depicted as a horizontal line. Changes in aggregate demand affect GNP while leaving the price level unchanged.

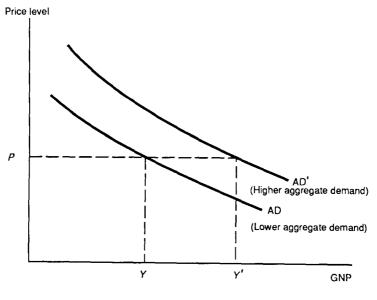


Figure 1-2

Neither the model with flexible prices nor the model with sticky prices provides a complete description of the economy. The model with sticky prices can account for short-run fluctuations in output and employment, but cannot explain inflation. The model with flexible prices can explain inflation, but not short-run fluctuations.

Price adjustment bridges the gap between the model with sticky prices and the model with flexible prices. In its simplest form, the idea of price adjustment is that when output is less than potential GNP there is pressure on prices to adjust downward. When output exceeds potential GNP, there is pressure on prices to adjust upward.

When we examine the behavior of individual firms and consumers, we will discover that expectations of the future play an important role. The theory of rational expectations is that firms and consumers, in forming their expectations, use whatever information is available to them in the most effective manner. While this seems innocuous, it has

far-reaching implications for the study of consumption, investment, and price adjustment.

One of the most important goals of macroeconomic policy-making is maintaining a steady growth of aggregate demand. There is considerable controversy, however, about how this should be accomplished. Monetarists such as Nobel laureate Milton Friedman, formerly of the University of Chicago and now of the Hoover Institute at Stanford University, believe that steady money growth will best stabilize the growth of aggregate demand. Keynesians such as Nobel laureates James Tobin of Yale University and Franco Modigliani of M.I.T. believe that changes in taxes, government spending, and the money supply should be used to offset other sources of instability in the economy.

Two major new schools of thought, both accepting the idea of rational expectations, have emerged in the last decade. New classicals such as Robert Lucas of the University of Chicago and Thomas Sargent of Stanford University maintain that wages and prices adjust very quickly. New Keynesians such as Edmund Phelps of Columbia believe that wages and prices adjust slowly. These differences in beliefs regarding the speed of wage and price adjustment, as we will see in Chapters 14 and 15, lead to very different explanations of economic fluctuations.

The remainder of the book develops a macroeconomic model that incorporates the concepts presented above. Sticky prices are assumed in the short run to explain fluctuations in output and employment. In the long run, flexible prices explain inflation and guide the economy to potential GNP. Price adjustment explains the transition from the short run to the long run. Rational expectations are assumed throughout.

Self-Test

The economy is in a ______ if production and employment are falling.
 When production and employment are increasing rapidly, the economy is in a ______.
 During the past 15 years, fluctuations in the United States economy have been larger and more erratic than at any time since _____.

•	The is the percentage change in the price level		
	from one year to the next.		
5.	is the most comprehensive measure of total		
	production in the United States.		
6.	The nominal interest rate minus the expected rate of inflation is		
	the		
7.	. If prices were workers and machines would be fully employed.		
8.	Shifts in demand influence output if prices are		
9.	If firms and consumers make the most of the information available		
	to them, they are said to form their expectations		
10.	output is the amount of output that can be produced		
	from the existing capital stock and labor force.		
11.	Real GNP adjusts the dollar value of goods pro-		
	duced for changes in prices.		
12.	The money supply divided by the price level is called		
	money.		
True	r-False		
13.	A peak is the bottom of a recession.		
14.	Economic fluctuations are regular and can be anticipated with great accuracy.		
15.	Interest rates are procyclical.		
16.	With perfectly flexible prices, shifts in demand cannot explain recessions and booms.		
17.	Macroeconomists are very successful at predicting interest rates.		
	The economy is in a recovery if production and employment are increasing rapidly.		

19. Economic fluctuations have increased since World War II.

- 20. Fluctuations in employment follow closely the fluctuations in real GNP.
- 21. With sticky prices, output always equals potential GNP.
- 22. Declines in inflation usually occur during recessions.
- 23. The recession in the early 1980s was the largest in the last 75 years.
- 24. The employment rate is the ratio of employed workers to unemployed workers.

Review Questions

- 25. What is the long-term pattern of economic fluctuations in the United States?
- 26. Explain why macroeconomics are concerned about economic fluctuations.
- 27. What other economic variables fluctuate along with GNP?
- 28. What determines potential output?
- 29. How are the price level and output determined in the models with flexible prices and sticky prices?
- 30. How are economic fluctuations explained in the models with flexible prices and sticky prices?
- 31. Why did Keynes reject the model with flexible prices?
- 32. Why is the model with sticky prices inappropriate for the long run?
- 33. What is the difference between Keynesians and monetarists?
- 34. What is a simple expression of the idea of price adjustment?
- 35. What is meant by rational expectations?
- 36. What is the difference between new classicals and new Keynesians?

Problem Set

Worked Problems

1. Suppose the aggregate demand curve is given by the expression Y = 4000 + 2000/P, where Y is output and P is the price level. Potential output is $Y^* = 5000 billion.

- a. Draw the aggregate demand and supply curves on a diagram with the price level *P* on the vertical axis and output *Y* on the horizontal axis.
- b. What is the price level *P* if prices are flexible?
- c. Suppose that prices are sticky and P = 1. What is the level of actual output? Is actual output Y above or below potential output Y*? Is there pressure on the price level to move upward or downward?
- d. Suppose that prices are sticky and P = 3. What is the level of output now? Is it above or below potential output? What pressure is there on prices?
- a. The aggregate supply curve is a vertical line where output = potential output = \$5000 billion. The aggregate demand curve is downward sloping because output demanded is lower if prices are higher.
- b. If prices are flexible output equals potential output. Thus 4000 + 2000/P = \$5000 billion, which can only hold if P = 2.
- c. If prices are sticky and P = 1, actual output Y = 4000 + 2000/1 = \$6000 billion. Since potential output $Y^* = 5000 billion, actual output is above potential, putting pressure on the price level to move upward.
- d. If prices are sticky and P = 3, actual output Y = 4000 + 2000/3 = \$4667 billion. Since potential output $Y^* = 5000 billion, actual output is below potential, putting pressure on prices to fall.
- 2. The price level was 54 in 1950, 69 in 1960, 92 in 1970, and 178 in 1980. What was the rate of inflation for the 1950s, 1960s, and 1970s? Why would models with sticky prices be more appropriate for the 1950s and 1960s than for the 1970s?

The rate of inflation was 28 percent for the 1950s, 33 percent for the 1960s, and 93 percent for the 1970s. Models with sticky prices are more appropriate for the 1950s and 1960s than for the 1970s because inflation was much lower.

Review Problems

- 3. Suppose the aggregate demand curve is given by the expression Y = 5000 + 3000/P, where Y is output and P is the price level. Potential output $Y^* = 6500 .
 - a. Draw the aggregate demand and supply curves.

- b. What is the price level *P* if prices are flexible?
- c. Suppose that prices are sticky and P = 3. What is the level of actual output? Is actual output Y above or below potential output Y^* ? Is there pressure on the price level to move upward or downward?
- 4. Suppose the aggregate demand curve is still given by Y = 5000 + 3000/P, but potential output $Y^* = 8000 .
 - a. Draw the new aggregate demand and supply curves.
 - b. What is *P* if prices are flexible? Compare your answer with Problem 3b.
 - c. Suppose that prices are sticky and P = 3. What is the level of output now? Is it above or below potential output? What pressure is there on prices?
- 5. Suppose that the aggregate demand curve is now given by Y = 6500 + 3000/P, with potential output $Y^* = 8000 .
 - a. Draw the aggregate demand and supply curves.
 - b. What is *P* now if prices are flexible? Compare your answer with Problem 4b.
 - c. Suppose that prices are sticky and P = 2. What is the level of output now? Is it above or below potential output? What pressure is there on prices?
- 6. The price level was 107.9 in 1984, 111.5 in 1985, and 114.5 in 1986. What were the rates of inflation for 1985 and 1986? If people expect the rate of inflation to be the average rate of inflation in the previous two years, what was the expected rate of inflation in 1986? If the interest rate in 1986 was 6 percent, what was the real interest rate?

Answers to the Self-Test

- 1. Recession
- 2. Recovery
- 3. The Great Depression of the 1930s
- 4. Inflation rate
- 5. Real gross national product
- 6. Real interest rate
- 7. Flexible
- 8. Sticky
- 9. Rationally

- 10. Potential
- 11. Nominal
- 12. Real
- 13. False. A peak is the top of a recovery.
- 14. False. They are irregular and cannot be predicted well.
- 15. True. They fall during recessions and rise during recoveries.
- 16. True. With perfectly flexible prices, shifts in demand cannot affect output. They can only affect prices.
- 17. False. Macroeconomists are no more successful at predicting interest rates than anyone else.
- 18. True. That is the definition of a recovery.
- 19. False. They have decreased in magnitude.
- 20. True. Employment falls during recessions and rises during recoveries.
- 21. False. With sticky prices, output can diverge from potential GNP.
- 22. True. In the past 20 years, almost all of the significant declines in the rate of inflation occurred during recession periods.
- 23. False. The Great Depression was much larger.
- 24. False. The employment rate is the ratio of employed workers to the working-age population.
- 25. Economic fluctuations were very large during the 1920s and 1930s, decreased during the 1950s and 1960s, and have increased, although not back to their pre–World War II levels, during the 1970s and 1980s.
- 26. Macroeconomists are concerned about fluctuations because people can be adversely affected, an example being unemployment and layoffs during recessions.
- 27. Employment, inflation, interest rates, and exchange rates also undergo fluctuations.
- 28. Potential output is determined by the productive capacity of the economy, which in turn is determined by the volume of productive factors—capital and labor. It is unrelated to the price level.
- 29. In the model with flexible prices, output is determined by potential output, and the price level is determined by aggregate demand. In the model with sticky prices, the price level is fixed by assumption, and output is determined by aggregate demand.
- 30. In the model with flexible prices, since output is determined by potential output, economic fluctuations can only occur when potential output changes. In the model with fixed prices, shifts in aggregate demand can cause fluctuations.
- 31. During the Great Depression, the decrease in real GNP was too large, 30 percent from 1929 to 1933, to be explained by shifts in potential output.
- 32. In the long run, an economic model should be able to explain inflation, which the model with sticky prices cannot do.
- 33. Monetarists believe that steady money growth will best stabilize the growth in aggregate demand. Keynesians believe in a more active use of policy. They feel that changes in taxes and government spending, as well as in the money supply, should be used to offset other sources of instability in the economy.

- 34. When output is less than potential GNP, there is pressure on prices to adjust downward. When output exceeds potential GNP, there is pressure on prices to adjust upward.
- 35. Rational expectations means that consumers and firms, when forming their expectations about the future, make the most of the information available to them.
- 36. New classicals believe that wages and prices adjust very quickly, while new Keynesians believe that they adjust slowly.

Solutions to Review Problems

- 3. a. The aggregate supply curve is a vertical line where output = potential output = \$6500. The aggregate demand curve is downward sloping.
 - b. If prices are flexible output equals potential output. Thus 5000 + 3000/P = \$6500, and P = 2.
 - c. If prices are sticky and P = 3, actual output Y = 5000 + 3000/3 = \$6000. Since potential output $Y^* = 6500 , actual output is below potential, putting downward pressure on the price level.
- 4. a. The new aggregate supply curve is a vertical line with $Y^* = 8000 . The aggregate demand curve is unchanged.
 - b. If prices are flexible, 5000 + 3000/P = \$8000, so P = 1. The price level is lower than in Problem 3b. This shows that, if prices are flexible, an increase in potential output with unchanged aggregate demand will lower prices.
 - c. Y = 5000 + 3000/3 = \$6000. Since $Y^* = 8000 , output is still below potential, and there is still downward pressure on prices.
- 5. a. The aggregate demand curve has a higher intercept but the same slope as before. The aggregate supply curve is the same as in Problem 4.
 - b. If prices are flexible, 6500 + 3000/P = \$8000, so P = 2. The price level is higher than in Problem 4b. This shows that, if prices are flexible, an increase in aggregate demand with unchanged potential output will raise prices.
 - c. If prices are sticky and P = 2, Y = 6500 + 3000/P = \$8000, which is also equal to potential output. There is no pressure on prices to either rise or fall.
- 6. The rate of inflation was 3.3 percent in 1985 and 2.7 percent in 1986. The expected rate of inflation in 1986 was 3 percent. The real interest rate was 3 percent.