

Hall and Taylor's

MACRO
ECONOMICS

STUDY GUIDE

DAVID PAPELL

Study Guide
Hall and Taylor's
MACROECONOMICS

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W.W. Norton and Company
New York London

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Published simultaneously in Canada by Penguin Books Canada Ltd,
2801 John Street, Markham, Ontario L3R 1B4

Printed in the United States of America.

First Edition

ISBN 0-393-95446-3

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

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Preface

The purpose of this study guide is to help you learn the material in Hall and Taylor's *Macroeconomics*. 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.

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PART I

**Fundamentals of
Macroeconomics**

CHAPTER 1

The Macroeconomy

Main Objectives

During the past ten 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. Macroeconomics aims to explain fluctuations in these variables. Its main concerns and basic terminology are introduced in Chapter 1. Though it's a heavy dose, mastering the terminology in this chapter is essential to following the material in later chapters.

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 contracting 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**.

Gross national product (GNP) is the dollar value of the goods and services produced in this country during a given period of time. The **price level** measures the overall level of the prices of the goods and services in GNP. The **rate of inflation** is the percentage change in the price level from one year to the next. Gross national product adjusted for changing prices is called **real GNP**, and measures the physical amount of production.

The **capital stock** is the amount of equipment, structures, and land in the economy. 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 checking accounts.

Potential output (or **potential GNP**) 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 two major macroeconomic models: **flexible price** and **sticky price**. 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. Sticky-price models postulate that this adjustment takes time and explain fluctuations by bottlenecks in the adjustment process.

The flexible-price model is illustrated in Figure 1-1. The **aggregate supply curve** is a vertical line that depicts potential output. In Chapter 5 we will see why potential output does not depend on the price

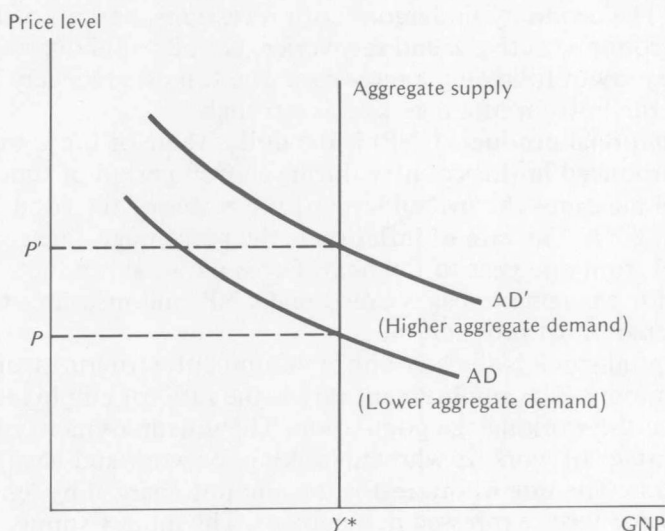


Figure 1-1

level. The **aggregate demand curve**, which slopes downward, is the total amount of demand throughout the economy. In Chapter 4 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.

According to the flexible-price model, 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 macro-economic model, the sticky-price model, where shifts in aggregate demand could affect GNP. The sticky-price model 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.

Neither flexible-price nor sticky-price models provide a complete description of the economy. Sticky-price models can account for short-run fluctuations in output and employment, but cannot explain inflation. Flexible-price models can explain inflation, but not short-run fluctuations.

Price adjustment bridges the gap between sticky-price and flexible-price models. 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.

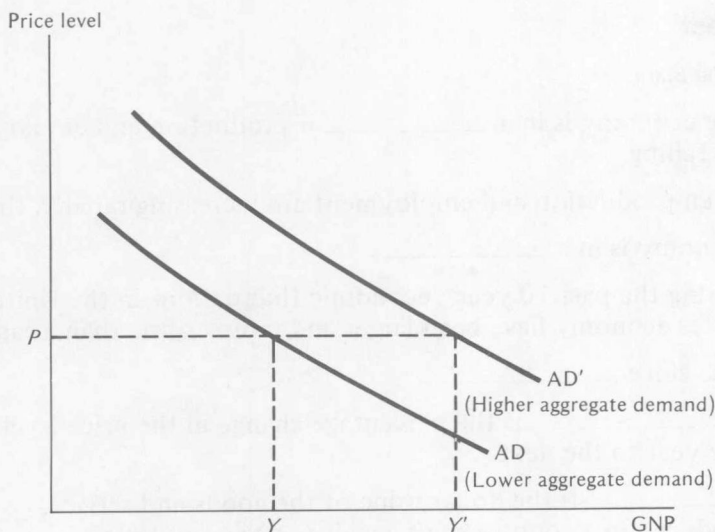


Figure 1-2

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 Noble 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.

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 to the long run. Rational expectations are assumed throughout.

Self-Test

Fill in the Blank

1. The economy is in a _____ if production and employment are falling.
2. When production and employment are increasing rapidly, the economy is in a _____.
3. During the past 10 years, economic fluctuations in the United States economy have been larger and more erratic than at any time since _____.
4. The _____ is the percentage change in the price level from one year to the next.
5. _____ is the dollar value of the goods and services produced in a country during a given period of time.

6. The 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 gross national product is GNP adjusted for _____.
12. The money supply divided by the price level is called _____ money.

True-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.
18. 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.

Review Questions

23. Explain why macroeconomists are concerned about economic fluctuations.

24. What other economic variables fluctuate along with GNP?
25. What determines potential output?
26. How are the price level and output determined in the flexible-price and sticky-price models?
27. How are economic fluctuations explained in the flexible-price and sticky-price models?
28. Why did Keynes reject the flexible-price model?
29. Why is the sticky-price model inappropriate for the long run?
30. What is the difference between Keynesians and monetarists?
31. What is a simple expression of the idea of price adjustment?
32. What is meant by rational expectations?

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 sticky-price models 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. Sticky-price models 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 207 in 1982, 216 in 1983, and 223 in 1984. What were the rates of inflation for 1983 and 1984? 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 1984? If the interest rate in 1984 was 10 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. Gross national product
6. Real interest rate
7. Flexible
8. Sticky
9. Rationally
10. Potential
11. Inflation
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. Macroeconomists are concerned about fluctuations because people can be adversely affected, an example being unemployment and layoffs during recessions.

24. Employment, inflation, interest rates, and exchange rates also undergo fluctuations.
25. 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.
26. In the flexible-price model, output is determined by potential output, and the price level is determined by aggregate demand. In the sticky-price model, the price level is fixed by assumption, and output is determined by aggregate demand.
27. In the flexible-price model, since output is determined by potential output, economic fluctuations can only occur when potential output changes. In the fixed-price model, shifts in aggregate demand can cause fluctuations.
28. 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.
29. In the long run, an economic model should be able to explain inflation, which the sticky-price model cannot do.
30. 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.
31. 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.
32. Rational expectations means that consumers and firms, when forming their expectations about the future, make the most of the information available to them.

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 4.3 percent in 1983 and 3.2 percent in 1984. The expected rate of inflation in 1984 was 3.75 percent. The real interest rate was 6.25 percent.