

**SOLUTIONS MANUAL**



**MACROECONOMICS**

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# CHAPTER 2. A TOUR OF THE BOOK

## I. MOTIVATING QUESTIONS

### 1. How do economists define output, the unemployment rate, and the inflation rate, and why do economists care about these variables?

Output and the unemployment rate are defined in the usual fashion. The text defines the inflation rate in two ways: the percentage change in the GDP deflator and the percentage change in the CPI. The link between output and the standard of living is implicit in the chapter. Economists care about the unemployment rate because the unemployed suffer, particularly if they remain unemployed for long periods of time, and because the unemployment rate provides an indicator of whether the economy is growing too fast or too slowly (concepts that will be defined precisely later in the book). Inflation has three main effects: it redistributes real income away from those who receive fixed nominal income, it distorts relative prices to the extent that some nominal variables do not adjust, and it creates uncertainty about relative price levels.

### 2. What factors affect output in the short run, the medium run, and long run?

This chapter introduces the basic framework of the book in terms of time. In the short run (a time frame of a few years), output is determined primarily by demand. In the medium run (a time frame of a decade or so), output is determined by the level of technology and the size of capital stock, both of which are more or less fixed. In the long run (a time frame of a half century or more), output is determined by technological progress and capital accumulation.

## II. WHY THE ANSWERS MATTER

Students need a formal definition of the basic macroeconomic variables before they can analyze them. The discussion in this chapter provides enough information for students to begin looking at macroeconomic data. Moreover, some discussion of why economists care about these variables, particularly inflation, is useful to orient students.

## III. KEY TOOLS, CONCEPTS, AND ASSUMPTIONS

### 1. Tools and Concepts

*i.* Chapter 2 introduces **index numbers**.

*ii.* The chapter defines formally the basic macroeconomic concepts of **nominal** and **real gross domestic product (GDP)**, **GDP growth**, the **GDP deflator**, the **unemployment rate**, the **consumer price index (CPI)**, and the **inflation rate**, as well as associated concepts such as **valued added**, **intermediate inputs**, the **labor force**, and the **participation rate**. All of these concepts are defined in the usual manner.

*iii.* The chapter distinguishes the **short run**, the **medium run**, and the **long run** in the manner described above in Part I. The distinction establishes the basic theoretical framework for the book.

## IV. SUMMARY OF THE MATERIAL

### 1. Aggregate Output

The text considers a closed economy until Chapter 18, so output is equated with gross domestic product (GDP). Output has three equivalent definitions: (1) the value of final goods and services produced during a given period, (2) the sum of value added during a given period, and (3) the sum of labor and capital income and indirect taxes.

Using the first definition, nominal GDP is output valued at current prices. Real GDP is output valued at constant prices. If the economy produced only one good—say, SUVs—and this good were unchanged over time, one could measure real GDP by simply counting the number of SUVs produced each year. Alternatively, one could multiply the number of SUVs by some constant price—say, the price in some base year. Thus, in the base year, real and nominal GDP would be the same. In practice, the construction of real GDP involves two complications. First, since the economy produces many goods, one must decide how to weight the value of the output of each good to produce aggregate real GDP. The text notes that the United States has adopted a technique—chain weighting—that allows the relative price of goods to change over time. The appendix to Chapter 2 discusses the construction of GDP and chained indexes in more detail. Second, the quality of similar goods changes over time. Economists who construct GDP try to account for quality change in goods through hedonic pricing, an econometric technique that estimates the market value of a good's characteristics—speed, durability, and so on.

The growth rate of real (nominal) GDP is the rate of change of real (nominal) GDP. Periods of positive GDP growth are called expansions; periods of negative growth, recessions.

### 2. Unemployment and Inflation

*i. The Unemployment Rate.* An unemployed person is someone who does not have a job, but is looking for one. The labor force is the sum of those who have jobs—the employed—and the unemployed. The unemployment rate is the ratio of unemployed persons to the labor force. Those persons of working age who do not have a job and are not looking for one are classified as out of the labor force. The participation rate is the ratio of the labor force to the size of the working age population.

Economists care about unemployment for two reasons. First, the unemployed suffer. Exactly how much depends on a number of factors, including the generosity of unemployment benefits and the duration of unemployment. In the United States, the average duration of unemployment is relatively low, but some groups (e.g., ethnic minorities, the young, and the less skilled) tend to be more susceptible to unemployment and to remain unemployed much longer than average. Second, the unemployment rate helps policymakers assess how well the economy is utilizing its resources. A high rate of unemployment rate means that labor resources are idle. A low rate of unemployment can also be a problem, if the economy develops labor shortages. A more precise discussion of what constitutes an unemployment rate that is too high or too low is offered later in the book.

*ii. The Inflation Rate.* The inflation rate is the growth rate of the aggregate price level. Since there are many goods produced and consumed in an economy, constructing the aggregate price level is not trivial. Macroeconomists use two primary measures of the aggregate price level. The first, the GDP deflator, is the ratio of nominal to real GDP. Since nominal and real GDP differ only because prices in any given year differ from the base year, the GDP deflator provides some measure of the average price level in the economy, relative to the base year. By construction, the GDP deflator equals one in the base year. Since the choice of base year is arbitrary, the level of the GDP deflator is meaningless. The rate of change of the GDP deflator, however, is meaningful; it is one measure of inflation.

Measures with arbitrary levels but well-defined rates of change are called index numbers. The GDP deflator is an index number.

An alternative measure of the price level is the Consumer Price Index (CPI)—another index number. In the United States, this measure is based on price surveys across U.S. cities. The prices of various goods are weighted according to average consumer expenditure shares in the United States. The construction of the CPI and the construction of real GDP involve similar problems. One can also measure inflation as the rate of change in the CPI.

The relationship between inflation measured from the GDP deflator and inflation measured from the CPI is very close, but not perfect. The differences arise because the two price indexes apply to different baskets of goods. GDP measures production of final goods, so inflation calculated from the GDP deflator provides a measure of the percentage change in the aggregate price of final goods produced in an economy. The CPI, on the other hand, measures the price of a representative basket of private consumption, so inflation calculated from the CPI provides a measure of the percentage change in the price of the domestic consumption basket. Domestic consumption includes goods imported from abroad, and domestic production includes final goods used for purposes other than domestic consumption.

Economists care about inflation because it can distort relative prices, produce uncertainty about relative prices, and redistribute income. Inflation distorts relative prices because some nominal variables do not adjust immediately to the rise in the aggregate price level. Inflation redistributes income because some transactions involve fixed nominal payments. For example, some retirees receive fixed nominal incomes (although the text notes that U.S. Social Security payments rise with the CPI).

Inflation may be costly, but there are also economic problems associated with deflation (negative inflation). For example, some of the costs of inflation would also apply to deflation. Moreover, deflation limits the ability of monetary policy to affect output. Consideration of the costs of inflation and the costs of deflation seems to suggest that there is an optimal rate of inflation. Most economists favor a stable inflation rate somewhere between 0 and 3%.

### **3. The Basic Macroeconomic Framework and a Road Map for the Book**

Macroeconomists view the economy in terms of three time frames. In the short run—a few years or so—demand for goods and services determines output. In the medium run—a decade or so—the level of technology and the size of the capital stock determine output. Since these variables change slowly, it is a useful simplification to assume that they are fixed in the medium run. Finally, in the long run, technological progress and capital accumulation are the primary determinants of output growth.

The remainder of the book can be divided into three sections: “Core” material (Chapters 3-13), extensions to the Core, and concluding chapters on macroeconomic policy and the state of macroeconomic thinking. The Core is organized around the three time frames. It discusses the short run in terms of the *IS-LM* model, the medium run in terms of the *AS-AD* model (which incorporates *IS-LM*), and the long run in terms of the Solow growth model, with some additional discussion of other approaches. After the Core, there are three extensions: expectations (Chapters 14-17), the open economy (Chapters 18-21), and pathologies (Chapters 22-23). Pathologies include the Great Depression, Japan’s economic slump, and hyperinflation. After the extensions, the book concludes with three chapters on the scope for economic policy and a final chapter on the history of thought in macroeconomics.

The book is constructed so that the three extensions can be addressed in any order after the Core. Indeed, most of the material in the extension chapters can be discussed without covering the growth section of the Core. In addition, much of the material in the policy chapters can be discussed immediately after the Core, without any of the extensions. Thus, there are a number of options for constructing a course around the text.

## V. PEDAGOGY

### 1. Points of Clarification

The use of subscripts to index time will be new for many students. A few minutes of clarification may be worthwhile at the outset.

### 2. Alternative Sequencing

The chapter does not discuss national income accounting in any detail. Instead the relevant accounting identities are presented in the main text as they become relevant for the development of the analytical model. For example, Chapter 3 presents the expenditure side of the accounts in the course of explaining the composition of aggregate demand. A complete treatment of the national income and product accounts is also presented in Appendix 1. Instructors may prefer to introduce the material from Appendix 1 immediately after Section 1 of this chapter.

### 3. Enlivening the Lecture

It is difficult to add much life to the definitions chapter of macroeconomics. One way to reduce the number of definitions is to focus only on output at this point. The unemployment and inflation definitions could be postponed until Chapter 6, which introduces the labor market and aggregate supply. A benefit of this approach is a more rapid advance to the Keynesian cross in Chapter 3. A cost is the need to say something about the aggregate price level in the *LM* curve in Chapter 5.

## VI. EXTENSIONS

### 1. GDP as a Measure of Welfare

The chapter discusses briefly why economists care about inflation and unemployment, but does not do the same for GDP. It is probably obvious that economists use GDP as a gross measure of aggregate welfare, but instructors may wish to point out that there are (at least) three limitations on GDP as a welfare measure.

- i. Measured GDP values goods and services at market prices, since these reflect the relative values placed on them by consumers. However, some valuable things are not sold on markets, and their values thus have to be imputed, a process that undoubtedly introduces some errors. Two important services that do not have a market price are government services and owner-occupied housing.
- ii. Some goods and services not traded in markets are omitted altogether from the GDP calculation. For example, the value of leisure and the value of services performed in the household are not included in GDP. From a broader perspective, one might also cite civil liberties and other political “goods” as nonmarket goods produced by a nation, but not included in GDP.

iii. GDP does not account for the fact that some of a nation's wealth is depleted in the process of producing it. NDP corrects this to some extent by subtracting the value of depreciated physical capital, but depletion of natural and environmental resources is still omitted. The Department of Commerce and others have experimented with adjustments to GDP to account for resource and environmental depletion, but there is no consensus among economists about the proper methodology.

## **2. Stocks and Flows: Wealth and GDP**

The text does not introduce the concepts of stocks and flows until Chapter 4 (Financial Markets). Instructors could introduce these concepts in this chapter by distinguishing national wealth (a stock) from GDP (a flow). A natural definition of national wealth is the value of the nation's land (including natural resources), physical and human capital, and claims on foreigners at a given point in time.