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Chapter 6

Measuring Economic Activity

After reading this chapter, you will understand the following:

1. How the government measures gross domestic product
2. How domestic income differs from gross domestic product
3. The major types of international transactions
4. How the government measures inflation
5. The limitations of official economic statistics

Before reading this chapter, make sure you know the following concepts:

Real and nominal values

Indexation

Transfer payments

Domestic income and product

Chapter Outline

Measurement matters. Every day, new data on GDP, prices, and trade deficits reach our laptops, smartphones, and tablets. People act on them, instantly, throughout the world. An upward revision of the estimate for real output can send stock markets higher. News that a country's trade deficit has increased can send its exchange rate plunging. News that inflation is rising suddenly and unexpectedly can affect interest rates, bond prices, and the prices of commodities like gold and oil. Just having instant access to the numbers, however, is not enough. To use the latest data intelligently, you must know what they mean and where they come from. That means knowing not only the meaning of terms and concepts but also how they are measured.

We call the official government data on aggregate economic activity the **national income accounts**. The economists and statisticians whose job it is to make these measurements for the US economy are among the best such teams in the world. Yet, as this chapter will show, they have a hard job. They must deal with technical problems posed by sampling errors and survey methods. They encounter conceptual problems when real-world data sources do not match the theoretical categories of economic models. They constantly encounter trade-offs between accuracy and timeliness. This chapter addresses all of these issues and more.

National income accounts
A set of official government statistics on aggregate economic activity

6.1 The National Income Accounts in Nominal Terms

We begin with an examination of the national income accounts in nominal terms—that is, in terms of the prices at which sales of goods and services actually take place. Nominal measures do not tell the whole story because they do not include adjustments for inflation. They do provide a starting point, however. Government statisticians first collect the data in nominal form. Only after they have assembled a set of nominal accounts can they begin the process of adjusting for price changes.

Gross domestic product (GDP)
(1) A measure of the value of total output of goods and services produced within a country; (2) The value at current market prices of all final goods and services produced annually in a given country

Final goods and services
Goods and services sold to or ready for sale to parties that will use them for consumption, investment, government purchases, or exports

Intermediate goods
Goods and services that firms buy for use as inputs in producing other goods and services

Value added
The dollar value of an industry's sales less the value of intermediate goods purchased for use in production

6.1a Gross Domestic Product

The most widely publicized number in the national income accounts is gross domestic product. Chapter 4 gave a preliminary definition of **gross domestic product (GDP)** as a measure of the value of total output of goods and services produced within a country. We can now add a more technical definition: GDP is the value at current market prices (that is, the nominal value) of all final goods and services produced annually in a given country.

The term **final goods and services** is a key part of the definition of gross domestic product. GDP attempts to measure the sum of the economic contributions of each firm and industry without missing anything or counting anything twice. To do this accurately, it is important to count only goods sold to *final users*—parties that will use them for domestic consumption, government purchases, investment, or export. **Intermediate goods**—those that firms buy for use as inputs in producing other goods or services—are not counted when we measure GDP.

Table 6–1 shows why counting both final and intermediate goods would overstate total production. The table traces the process of producing a kitchen table that has a retail price of $400. The final stage of production takes place in a furniture factory, but the factory does not do $400 worth of work. Instead, it produces the table by taking $160 worth of lumber and adding $240 worth of labor of factory workers. The $160 worth of lumber is an intermediate good; the $240 contribution made by the manufacturer is the **value added** to the product at its final stage. (In practice, the firm would also use other

intermediate goods, such as paint and fuel for heating the plant, and other factors of production, like capital in the form of woodworking equipment. To simplify the example, we assume that lumber and labor are the only inputs.)

Table 6–1 Value Added and the Use of Final Products in GDP

Final stage—manufacturing:	Value
Value of one table	$400
Less value of lumber	–$160
Equals value added in manufacturing	**$240**
Next-to-final stage—sawmill:	Value
Value of lumber	$160
Less value of logs	–$60
Equals value added at sawmill	**$100**
Second-to-final stage—forest products:	Value
Value of logs	$60
Less value of fuel, equipment, etc.	–$20
Equals value added in timber farming	**$40**
All previous stages:	Value
Value added in fuel, equipment, etc.	**$20**
Total value added	**$400**

This table shows why GDP must include only the value of final goods and services if it is to measure total production without double counting. We divide the value of sales at each stage of production into the value each firm adds at its own stage of production and the value of intermediate goods it buys. The selling price of the final product (a $400 kitchen table, in this case) equals the sum of the values added at all stages of production.

The second section of Table 6–1 shows the next-to-final stage of production: making the lumber. The sawmill buys $60 worth of logs, adds $100 worth of labor and capital, and produces lumber worth $160. The value added at the sawmill stage is thus $100.

Going still further back, we come to the stage at which the forest products company cuts the logs that are the source of the lumber. Inputs at that stage include $20 worth of fuel and purchased equipment, plus value added of $40 that represents factors of production used in tending the trees and harvesting the logs. That is an additional $40 of value added.

We could trace the process of making the table back to still earlier stages of production. The last section of the exhibit sums up the value added at all stages of production prior to timber farming—the fuel and equipment suppliers, their own suppliers, and so on. If we went back far enough, we could attribute every penny to the value added to the final product somewhere in the chain of production.

Now compare the first and last lines (rows) of the table. The value of the final goods turns out to be exactly equal to the sum of the values added at each stage of production. This is why we count only final goods as part of GDP. Adding together the $400 value of the finished kitchen table, the $160 value of the lumber, the $60 value of the logs, and so on would far overstate the true rate of productive activity (the true total value added) in the

economy. Note that it isn't exactly correct to say that intermediate goods aren't counted in GDP; they are counted, as they should be, because they are produced and GDP is a measure of production. However, they are not counted on their own as a separate line item; they are counted as part of the value of the final good into which they go. So a more nuanced way to say it is that *intermediate goods are not measured, but they are counted*.

6.1b Measuring the Economy by the Expenditure Approach

In principle, we could measure GDP by adding together the value of each good or service sold and adjusting for the cost of inputs to get the value added at each stage of production, as in Table 6–1. However, that is not the principal approach that government statisticians use. Instead, they use what we call the *expenditure approach,* which makes use of the equality of domestic product and total expenditure, which you learned about in the previous chapter. It is easier to gather data on the total amount that households, investors, governments, and buyers of exports spend on final goods than it is to stand at factory gates and count goods as they roll off production lines. Table 6–2 shows how it works, using 2021 data for the US economy.

Table 6–2 Nominal Gross Domestic Product by Type of Expenditure, 2021 (Dollars in Billions)

Personal consumption expenditure	**$1,5741.6**
Durable goods	2,026.2
Nondurable goods	3,455.2
Services	10,260.1
+ Gross private domestic investment	**4,120.0**
Fixed investment	4,139.8
Change in private inventories	-19.9
+ Government consumption expenditures and gross investment	**4,052.7**
Federal	1,565.0
State and local	2,487.7
+ Net exports of goods and services	**–918.2**
Exports	2,478.3
Imports	–3,396.5
= Gross domestic product (GDP)	**22,996.1**
– Allowance for consumption of fixed capital	–3,847.9
= Net domestic product (NDP)	**$19,148.2**

This table shows the procedure for estimating gross domestic product using the expenditure approach. This approach involves adding together the values of expenditures on newly produced final goods and services made by all economic units to get a measure of aggregate economic activity. Net domestic product is equal to gross domestic product minus the value of expenditures on replacement of worn-out or obsolete capital equipment.

Data source: Bureau of Economic Analysis, National Income and Product Accounts, Table 1.1.5 and Table 1.17.5, accessed August 23, 2022.

The first line of Table 6–2 gives total household consumption of both domestically produced and imported goods and services. The national income accounts divide consumption into three categories: durable goods like cars and appliances, nondurable goods like food and clothing, and services like medical care and banking. Figure 6–1 shows the percent of personal consumption expenditures going to goods (as opposed to services) over time. During most recessions, such as the Great Recession in 2008 and 2009, the fraction of consumption made up by goods tends to fall. But notice that during the COVID pandemic in 2020, spending on goods rose considerably. A major reason for this was the shift away from services that require a potentially unsafe personal interaction, such as restaurant meals and salon visits. This return to spending on goods put considerable renewed pressure on supply chains, already rocked by COVID, and is a significant factor in explaining the run-up of inflation in 2021 and 2022. Even a couple of years after the beginning of the pandemic, the share of consumption spending going to goods remains high, and shows little signs of returning to prepandemic levels anytime soon.

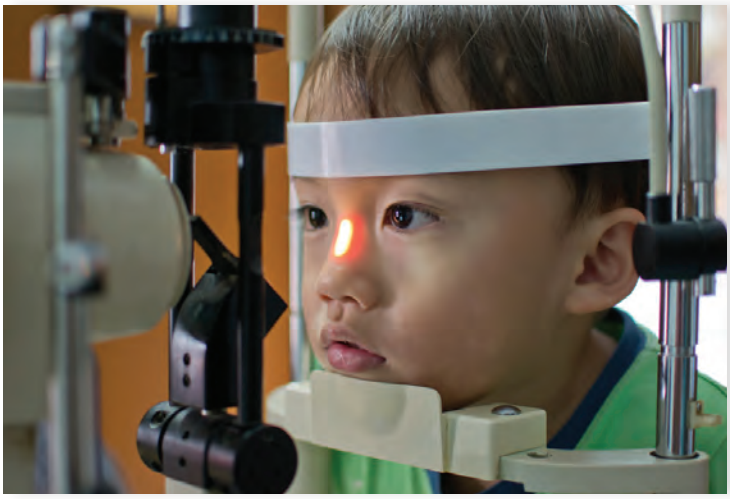
Figure 6–1 Goods as a Share of Consumption Expenditures, 1990–2021

During most recessions, a smaller share of consumption spending goes to goods. This was certainly true during the Great Recession in 2008 and 2009. However, during the COVID pandemic, spending on goods rose considerably, putting pressure on supply chains and contributing to rising inflation.

Data source: U.S. Bureau of Economic Analysis via Federal Reserve Bank of St. Louis [FRED].

All three components of consumption contain some items that do not pass through markets on their way to consumers. One such item is an estimate of the quantity of food that farm families produce and consume themselves. Another is an estimate of the rental value of owner-occupied homes. However, the national income accounts omit many nonmarket goods and services—for example, unpaid childcare and housework.

The item *gross private domestic investment* is the sum of all purchases of newly produced capital goods (fixed investment) plus changes in business inventories (inventory investment). The fixed investment component includes both business fixed investment—all new equipment and structures bought by firms—and the value of newly constructed residential housing. In effect, the national income accounts treat a family



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Medical care is included in the services section of the national income accounts.

that owns a home like a small firm. When the family buys the home, the accounts treat the purchase as an investment. They then treat the firm's "product"—the rental value of its shelter services—as part of annual consumption.

The gross private domestic investment item does not include investment in structures, software, and equipment by federal, state, and local governments, which accounts for about 25 percent of the total of all investment for the economy. From the point of view of short-run business cycle theory, it makes sense to treat government and private investment differently since the motives for the investment are different. However, from the point of long-term growth theory, government investment, like private investment, adds to a country's stock of capital and increases future natural real GDP.

As mentioned in Chapter 5, the item that economists call "government purchases" goes by the name "government consumption expenditures and gross investment" in the official national income accounts. Whether consumption-like or investment-like, government purchases enter into the national income accounts at cost. Accountants make no attempt to measure the value added by government because, in most cases, the goods and services it provides have no prices. Instead, governments pay for things like primary and secondary education, police protection, and national defense with revenue from taxes and provide them to the public without charge. The government's contribution to GDP does not include transfer payments like Social Security benefits or unemployment compensation. Those are omitted because they are not purchases of newly produced final goods and services.

Net exports—exports minus imports—are the last item in the GDP accounts. In calculating GDP, we must subtract imports from exports to avoid double counting. That is, because some of the goods that consumers, firms, and governments buy come from outside the domestic economy. For example, a consumer might buy a Japanese television set, an insurance company might buy Korean computers for use in its offices, and a city government might buy a Swedish police car. As a result, the figures for consumption, investment, and government purchases would overstate the final use of domestically produced goods and services. Adding total consumption, total investment, total government purchases, and exports, and then subtracting imports, yields the same sum we would get by adding only consumption of domestically produced goods, only purchases of domestically produced capital goods, only government purchases of domestically produced goods, and total exports.

What makes gross domestic product "gross"? It is the fact that gross private domestic investment measures total additions to the nation's capital stock without adjusting for losses through wear and tear or obsolescence. Gross private domestic investment includes the value of each year's production of new homes and factories without subtracting the value of old homes and factories that are torn down.

Gross private domestic investment minus an allowance for depreciation and obsolescence yields a measure called net private domestic investment, which is a measure of the actual net addition to the nation's capital stock each year. Only net investment adds to the capital stock, thereby helping to expand the economy's natural real output over time. The part of gross investment that covers depreciation and obsolescence only keeps the capital stock from shrinking.

Although depreciation and obsolescence are hard to measure accurately, national income accountants use an approximate measure called the *allowance for consumption of fixed capital*. Gross domestic product minus this allowance equals *net domestic product* (NDP).

6.1c Measuring the Economy by the Income Approach

In addition to GDP, measured using the expenditure approach, the national accounts report a measure of national income based on what economists call the *income approach*. The income approach measures wages, rents, interest, and profits as they flow into the household sector. Table 6–3 summarizes this approach.

The first element of national income is *compensation of employees*, which consists of wages and salaries plus certain supplements. Employer contributions to social insurance (Social Security and Medicare) are the most important supplement. By law, employees pay only half of social insurance taxes; employers must pay the other half. However, because both halves contribute to employees' retirement benefits, the national income accounts include both halves as part of employee compensation. Other supplements include employer-paid health insurance and employer contributions to 401(k) and other private pension plans.

Rental income of persons consists of all income in the form of rent and royalties received by property owners. Net interest includes interest income received by households, less the interest they pay as consumers.

Corporate profits include all income earned by the shareholders of corporations. Firms pay part of that income to shareholders in the form of dividends. Another part of corporate profits goes to pay taxes. Firms hold back a third part, undistributed corporate profit, for reinvestment. Because reinvestment of profits adds to shareholder wealth, we count it, too, as a part of household income. The accounts also adjust corporate profits for changes in the value of inventories and for consumption of fixed capital (depreciation).

Corporate profits account for only about 60 percent of all business income. The rest appears on the next line in Table 6–3, *proprietors' income*. This item lumps together all forms of income earned by self-employed professionals and owners of unincorporated business.

The final item, *indirect business taxes and business transfers*, is a catchall category that includes items that are expenses to firms but unlike factor payments, do not generate income for individuals. Business property taxes are one such item. Business transfer payments are payments in return for which the firms do not receive services. They include corporate gifts, insurance settlements, and some other small items.

The total of these items is **national income**, the total income received by a country's residents. The term *national* means that this is a measure of income earned by a country's residents, regardless of whether their productive services take place in the home country or another country. For example, corporate profits shown in the table would include the profits earned on capital the Ford Motor Company has invested in a plant in Japan, but they would not include profits earned on capital that Honda Motors has invested in a plant in the United States. In contrast, *domestic* income and product are geographical concepts that measure activity that takes place on the territory of a country, regardless of who owns the factors of production involved. We can obtain a geographical measure of income, **domestic income**, by subtracting net factor income received from abroad (NFIA), which is the factor income received by US residents from the rest of the world minus factor income paid to foreign residents.[1]

National income
The total income earned by a country's residents, including wages, rents, interest payments, and profits

Domestic income
The total income of all types, including wages, rents, interest payments, and profits, earned by factors of production used in producing domestic product

Table 6–3 Nominal Domestic Income, 2021 (Dollars in Billions)

Compensation of employees (wages, salaries, supplements)	**$12,598.7**
+Rental income of persons	740.7
+ Net interest	686.1
+ Corporate profits	2,805.8
+ Proprietors' income	1,821.9
+ Indirect business taxes, business transfers, etc.	1,284.8
= National income	**19,938.0**
− Net factor income from abroad	252.4
= Domestic income	**$19,685.6**

This table shows the measurement of national and domestic income according to the income approach, which adds together all forms of income earned by a country's residents. US national income includes some income received in return for factors of production used abroad and excludes payments to foreign residents for the use of factors owned by them but located in the United States. Domestic income is the sum of all income that results from production that takes place on the territory of a country. To derive domestic income from national income, we first subtract factor income received by this country's residents from the rest of the world and then add factor income paid to residents of the rest of the world in return for their activities in this country. In the table these two calculations are combined and shown as net factor income from abroad (NFIA). It is negative because factor income from the rest of the world exceeded factor income paid to the rest of the world.

Data source: Bureau of Economic Analysis, National Income and Product Accounts, Table 1.12 and Table 1.17.5, accessed August 23, 2022.

6.1d Reconciling the Income and Expenditure Approaches

The official accounts measure gross and net domestic product by the expenditure approach, using one set of data, and domestic and national income by the income approach, using a different set of data. No matter how careful the work, there will be some errors and omissions. That means the two sets of figures will not quite fit together. The difference between net domestic product and domestic income is statistical discrepancy. Most of the time this error is very small—well below 1 percent of GDP. Theoretical models, including those in this book, ignore the statistical discrepancy completely. They treat domestic income and domestic product as equal by definition.

6.2 Measuring International Linkages

The item "net exports" in the national income accounts gives a glimpse of the linkage between the domestic economy and the rest of the world. These ties have grown over time. In 1960, US exports amounted to only 6 percent of GDP and imports to less than 5 percent. Today, exports account for about 11 percent of a much larger GDP. Imports have grown even more rapidly and now equal about 15 percent of GDP. In view of the growing importance of the foreign sector, then, it is worth taking a closer look at the international ties of the US economy.

It is not easy to discuss an economy's balance of international payments because thousands of different kinds of international payments take place every day. Payments for exports and imports of goods and services are only part of the story. Equally important are long- and short-term international loans, purchases and sales of securities, and direct investments in foreign businesses. In addition, governments and private individuals make many kinds of transfer payments to residents of other countries, including outright gifts, pension payments, and official foreign aid. Finally, the US Federal Reserve System and foreign central banks engage in many kinds of official transactions. Table 6–4 shows a simplified version of the accounts used to keep track of these international transactions for the United States.

(Katherine Welles/Shutterstock)

US imports totaled 14.8 percent of GDP in 2021.

6.2a The Current Account

The first section of the international accounts shown in Table 6–4 is the current account. This section includes imports and exports of goods and services, payments of factor income between countries, and international transfer payments.

Imports and exports of goods are the most widely publicized items in the international accounts. During much of the nineteenth century, the United States was a net importer of goods. From 1894 to 1970, it was a net exporter. Since 1970, it has again become a net importer, as shown by the negative number in line 1 of Table 6–4. The balance on goods is also known as the **merchandise balance**.

In addition to trade in merchandise, there is a large international trade in services. Travel expenditures, airline passenger fares, and other transportation services account for somewhat more than half of these services. Other services include insurance, royalties, and license fees. The United States is a net exporter of services even though it is a net importer of goods.

Earlier, in drawing the distinction between domestic and national product, we noted that US residents receive substantial flows of factor income (wages, profits, interest, and so on) from production activities that take place abroad. The accounts record those payments as exports; they enter the current account with a positive sign. At the same time, some payments of factor income go to residents of other countries that participate in production activities in the United States. The accounts treat those payments as imports; they enter the current account with a negative sign. The United States typically receives more factor income from abroad than it pays. Thus, line 7 in Table 6–4 is positive.

The final item on the current account consists of net transfer receipts. This is typically a negative item in the US international accounts because transfers to other countries exceed transfers received from them. This item takes into account both government transfers (for example, foreign aid and Social Security payments to retired workers living abroad) and private transfers (for example, remittances sent to relatives abroad by US residents and private charitable contributions to beneficiaries overseas).

The sum of merchandise trade, services, factor income, and net transfers is the country's **current account balance**. The United States has had a current account deficit every year since 1981. The official term "current account balance" sometimes appears in news reports and other popular discussions, but not everyone is careful in their use of terminology. Sometimes people use the terms "balance of payments" or "balance of trade" when they mean the current account balance. To add to the confusion, people sometimes use the term "balance of trade" to mean the merchandise balance or even the sum of trade in goods and services.

Merchandise balance
The value of a country's exports of goods (merchandise) minus the value of its imports of goods

Current account balance
The value of a country's exports of goods and services minus the value of its imports of goods and services plus its net transfer receipts from foreign sources

Table 6–4 US International Accounts for 2021 (Dollars in Billions)

Line	Current Account	Billions of US Dollars
1.	**Balance on goods**	**–$1,090.2**
2.	Exports of goods	1,761.4
3.	Imports of goods	–2,851.6
4.	**Services, net**	**245.3**
5.	Exports of services	795.3
6.	Imports of services	–550.0
7.	**Net receipts of factor income**	**139.5**
8.	Income receipts from abroad	1052.1
9.	Income payments by the United States	–912.6
10.	**Transfers, net**	**–140.8**
11.	**Current Account Balance (Lines 1 + 4 + 7 + 10)**	**–846.2**

Line	Capital and Financial Account	Billions of US Dollars
12.	**Net US acquisition of foreign assets ("–" indicates that this is a financial outflow)**	**–$1,278.6**
13.	Direct investment	–421.7
14.	Portfolio investment and other	–695.3
15.	Change in official reserve assets	–113.9
16.	**Net increase in US liabilities to foreign entities ("+" indicates that this is a financial inflow)**	**1,977.3**
17.	Direct investment	448.3
18.	Portfolio investment and other	–176.7
19.	**Financial derivatives, net transactions**	**41.9**
20.	**Financial Account Balance (Lines 12 + 16 + 19)**	**740.6**
21.	Capital account transfers, net	–$2.5
22.	Statistical discrepancy	–108.2

This table gives details of US international transactions for 2021. The first section shows current account transactions, consisting of imports and exports of goods and services, together with international flows of factor income and transfer payments. The second section shows capital and financial account transactions, consisting of international borrowing and lending, securities transactions, direct investment, and official reserve transactions. If all amounts were complete and accurate, the current account and financial account balances would be equal and opposite in sign. In practice, there is a statistical discrepancy that indicates errors and omissions in measurement.

Data source: Bureau of Economic Analysis, International Transactions, International Services, and International Investment Position Tables, Table 1.2, accessed August 26, 2022.

6.2b The Capital and Financial Account

Current account transactions are not the only ones that take place among residents of different countries. International lending and borrowing, and international sales and purchases of assets, also account for an enormous volume of daily transactions. A US company, for example, might obtain a short-term loan from a London bank to finance the purchase of a shipload of beer for import to the United States, which would

be recorded as an increase in US liability to foreign creditors. The Brazilian government might sell bonds to Bank of America to help finance a hydroelectric project, which would be recorded as an increase in US holdings of foreign assets. Such transactions appear in the capital and financial account section of Table 6–4.

In this book, we use the shorter term *financial account* to refer to that section of the international accounts. Some writers, instead, use the term *capital account* as shorthand to refer to the entire capital and financial account.

Purchases of US assets by foreign residents and borrowing from foreign financial intermediaries by US firms and individuals create flows of funds into the United States that we call **financial inflows**. (Many writers instead use the term *capital inflows*.) Purchases of foreign assets by US residents or loans by US financial intermediaries to foreigners create flows of funds out of the United States that we call **financial outflows**. (Many writers use the term *capital outflows*.)

(Shutterstock)

International borrowing and lending appear in the financial section of the US international accounts.

Table 6–4 lists several types of capital and financial account transactions. Changes in US private assets include *direct investments* (for example, construction of foreign plants by US firms) and *portfolio investments*—that is, purchases of foreign securities like stocks or bonds. Acquisition of short-term foreign assets like foreign bank balances and foreign currency are also included on this line. Changes in US official reserve assets include foreign currency and other foreign assets acquired by the Federal Reserve System and the US Treasury.

6.2c Relationship of the Accounts

There is a close logical relationship between the balance on the capital and financial account and the current account surplus or deficit. Because the United States runs a current account deficit, its earnings from the sales of exports are not enough to pay for all of its imports. It gets the additional funds it needs to finance the excess imports through net financial inflows—that is, through net US borrowing from abroad or net sales of US assets to foreign residents. Any country in this position shows a surplus on the capital and financial account that offsets the current account deficit.

Countries like China that usually have current account surpluses are in the opposite position. They need to find something to do with the extra export earnings not used to buy imports. Their private sectors can use the export earnings to make loans to foreign borrowers or to accumulate foreign assets through direct or portfolio investment, or their governments can use the export earnings to accumulate foreign exchange reserves or to purchase assets for national wealth funds like those of Norway or Saudi Arabia. In any case, countries with current account surpluses have negative balances on their capital and financial accounts.

In principle, the balances of the current and financial accounts should be equal and opposite in sign. If there is a current account surplus of $100 billion (entered with a plus sign in the accounts), there should be a net financial outflow of $100 billion (entered with a minus sign in the accounts). If there is a current account deficit of $500 billion, there should be a net financial inflow of $500 billion. The reason for the symmetry is that the two sections of the accounts, taken together, include all the sources and uses of the funds that change hands in international transactions. Because every dollar used must have a source, when the sources (+) and the uses (–) are added together, the sum should be zero.

Financial inflows
Purchases of domestic assets by foreign buyers and borrowing from foreign lenders, also often called *capital inflows*

Financial outflows
Purchases of foreign assets by domestic residents or loans by domestic lenders to foreign borrowers, also often called *capital outflows*

In practice, though, government statisticians always miss some items when they tally up imports, exports, and financial flows. As a result, the numbers do not quite add up. The difference between the current and financial account balances is the *statistical discrepancy*. Much of the discrepancy probably reflects unrecorded financial flows—for example, investments made by residents of other countries but never officially reported. Part of it also reflects incomplete recording of exports. Criminal activities, including drug smuggling (unrecorded current account activity) and money laundering (unrecorded financial account activity), can also contribute to the statistical discrepancy.

6.3 Measuring Real Income and the Price Level

From 2012 to 2020, the nominal value of US gross domestic product rose by 28 percent, from $16.3 trillion to about $20.9 trillion. However, that does not mean that the economy produced 28 percent more in terms of real goods and services. A big part of that increase in nominal GDP—about 4.3 percentage points, as it turns out—reflected increases in prices. Unless we know how much prices increase from one year to another, we cannot know how much of the change in nominal output was real and how much was the result of inflation. This section discusses two of the most important approaches to measuring changes in the price level.

6.3a Real Gross Domestic Product and the GDP Deflator

If you look at nominal GDP over time, you get the answer to this question: What happened to buyers' total spending on the country's goods and services? The amount spent on the country's output can change if the amount of output changes or if the prices change. Since Real GDP eliminates the effect of changing prices, it allows us to answer a different question: What happened to the amount of goods and services that the country produced?

The first step in calculating real GDP to answer that question would be to choose a year as a basis for comparison—that is, a **base year**. For example, we could ask what the value of the output of the US economy would have been in 2020 if prices in that year were the same as in the base year 2012. (2012 is a common base year for economic statisticians to use.) That would mean multiplying the number of chocolate bars sold in 2020 by their 2012 price, adding the quantity of gasoline sold in 2020 at its 2012 price, and so on. Following this method, the value of the goods and services produced in 2020 would have been worth approximately $18.4 trillion. That is quite a bit less than the $20.9 trillion nominal GDP for 2020, calculated at 2020 prices. While nominal GDP increased by 28 percent from 2012 to 2020, real GDP increased by only about 13 percent.

Base year
The year used as a basis for comparison when computing real GDP or a price index

GDP deflator
A measure of the average price level of goods and services based on the ratio of nominal GDP to year real GDP, stated relative to the prices of a chosen base year

The difference between the current year nominal 2020 GDP of $20.9 trillion and the 2020 real GDP of $18.4 trillion is due to price changes. The ratio of nominal GDP to real GDP gives us a measure of change in the price level that we call the **GDP deflator**. In our example, the ratio of 2020 nominal GDP to 2020 real GDP, calculated using 2012 as the base year, is 20.9/18.4 (or 1.14), indicating an increase in the GDP deflator over the period from 2012 to 2020 of about 14 percent.

We can use the base year in one of two ways in stating a measure of average prices, such as the GDP deflator. One way is to let the base-year value equal 1.0. We call a statement of average prices relative to a base-year value of 1.0 a statement of the price level. In our example, the 2020 **price level**, relative to the 2012 base year, is 1.14. The other way is to let the base-year value equal 100. A statement of average prices relative to a base-year value of 100 is a **price index**. In our example, the 2020 price index relative to the 2012 base year was 114. The price level and price index are two different ways of stating the same information. News reports more frequently use the index form. In building economic models, the price level form is more convenient.

In addition to the economy-wide GDP deflator, it is possible to calculate GDP deflators for individual components of GDP. The deflator for personal consumption expenditures is one example to which we will return shortly.

6.3b The Consumer Price Index

The GDP deflator is the most broadly based price index for the US economy, but "broad" is not always what we want. Instead, what is often of most interest is not the price level for the whole economy but the cost of living, as determined by the prices of goods that consumers typically buy. That requires an index that omits elements of GDP like industrial equipment, office buildings, fighter planes, and fire engines that are not directly relevant to the cost of living.

The most widely used measure of the cost of living is the **consumer price index (CPI)**. In fact, the CPI is not just one index but a whole family of indexes that cover different population groups and regions. The best known is the CPI for all urban consumers. Its official designation is CPI-U, but more often than not people refer to it as just the CPI.

The CPI currently uses the period 1982–1984, rather than a single year, as its base. *Applying Economic Ideas 6–1* explains the method for calculating the CPI.

Price level
A weighted average of the prices of goods and services expressed in relation to a base-year value of 1.0

Price index
A weighted average of the prices of goods and services expressed in relation to a base-year value of 100

Consumer price index (CPI or CPI-U)
A price index based on the market basket of goods and services for a typical urban household

Producer price index (PPI)
A price index based on a sample of goods and services bought by business firms

6.3c Producer Price Indexes

The **producer price indexes (PPIs)** are still another way of measuring price changes. These are price averages for three classes of goods that business firms buy from and sell to one another. The producer price index we encounter most often is that for *finished goods*—investment goods sold to businesses plus other goods that are ready for final use but have not yet reached consumers (for example, wholesale sales of clothing to retail stores). Other producer price indexes cover intermediate goods and crude materials ready for further processing. Because producer price indexes measure prices at early stages in the production process, they can give hints for future trends in consumer prices. Firms also often use them to index payments that they make to one another.

Applying Economic Ideas 6–1

How to Calculate a Simple Consumer Price Index

Suppose we want to calculate the change in the cost of living from 2015 to 2022 for a simple economy in which there are only three goods: movies, apples, and shirts. The simplest approach, technically known as a *Laspeyres index,* would proceed according to the following five steps:

Step 1 Choose a base year—2015, in this case.

Step 2 Measure the base-year market basket—that is, the quantities of various goods that consumers bought in the base year. In this example, we see that in 2015, consumers bought tickets to 50 movies, ate 1,000 apples, and purchased 10 shirts.

Step 3 Record the prices of the goods in both the base year (2015) and the current year (2022). We learn that a movie ticket cost $5 in 2015 and $6 in 2022; an apple cost $0.60 in 2015 and $1.20 in 2022; and a shirt cost $15 in 2015 and $20 in 2022.

Step 4 Evaluate the base-year market basket at each year's prices. The table shows that it would have cost $1,000 to buy the full basket in 2015 and $1,700 to buy the same goods and services at the higher prices of 2022.

Step 5 Calculate the CPI itself. To do that, we first take the ratio of the value of the market basket at 2022 prices to its value at base-year (2015) prices. Then, to state it as an index, we multiply the ratio by 100.

The bottom line: the CPI for this hypothetical three-good economy rose from 100 in 2015 to 170 in 2022.

A Consumer Price Index for a Simple Economy

	2015 Quantity	2015 Price	Value of 2015 Quantity at 2015 Price	2022 Price	Value of 2015 Quantity at 2022 Price
Movies	50	$5.00	$250	$6.00	$300
Apples	1,000	0.60	600	1.20	1,200
Shirts	10	15.00	150	20.00	200
Totals			**$1,000**		**$1,700**

$$\text{CPI} = \frac{\$1{,}700}{\$1{,}000} \times 100 = 170.0$$

6.4 How Good Are the National Income Accounts?

The national income accounts of the United States are among the best in the world, but they are far from perfect. In this section, we focus on four possible problem areas: the accuracy and timeliness of the data, the underground sector of the economy, bias in price indexes, and nonmaterial aspects of the standard of living.

6.4a Accuracy Versus Timeliness

As we have emphasized, the measurement of GDP involves an enormous amount of data collection.[2] Both government and private decision-makers want the data they use to be timely and accurate; but, in practice, there is a trade-off. It is not feasible to station a monitor at every factory gate and supermarket checkout counter to record real-time data on all production and expenditures. Instead, national income accountants rely on detailed data that they collect at wide intervals and then update with more frequent, but less complete, sampling.

The most detailed data are those in "benchmark" estimates every five years. The benchmarks use an economic census that covers about 95 percent of all expenditures in GDP. Between the benchmarks, statisticians conduct annual surveys for about 150,000 reporting units and monthly surveys for about 35,000 units. The quarterly GDP estimates use a combination of the benchmark, annual, and quarterly surveys. Estimates based on past trends fill in the gaps where complete data are not yet available.

The Bureau of Economic Analysis (BEA) releases its first estimate of GDP for each quarter, called the "advance" estimate, about four weeks after the end of the quarter (for example, near the end of April for the first quarter of the year). The advance estimate incorporates actual data for about 45 percent of expenditures, with the rest coming from partial monthly data and trends. A month later, the BEA releases a second estimate, and a month after that, a "final" estimate.

About 85 percent of the final estimate comes from actual data collected in the quarter, with the remaining 15 percent based on trends for data that are still missing. To call it the "final" is a misnomer since the quarterly data are subject to a still more complete annual revision and to further revisions as much as several years later.

The GDP data in this book, for example, were compiled in early 2022. That means if you're reading this in late 2022 or later, the GDP statistics for 2021 in Table 6–2 could be slightly off from the final numbers. On average, the advance estimate of real GDP is revised up or down by 0.6 percentage points by the time of the "final" quarterly estimate, and on average by a little over one full percentage point by the time all eventual revisions are made. For example, the advance estimate for the second quarter of 2015, released in July 2015, showed real GDP increasing at a 2.3 percent annual rate. The second estimate, released in August 2015, showed growth of 3.7 percent—a larger-than-average revision.

6.4b The Underground Economy

The national income accounts provide a reasonably accurate measure of economic activity in the visible sector of the economy; much production, consumption, and investment escapes official measurement, however. The official accounts try to include some of that when they include estimates of the rental value of owner-occupied housing and the value of food produced and consumed on farms, but those items are only the tip of the iceberg.

Some underground activity is criminal. Economists have estimated that organized crime produces some $150 billion a year in illegal goods and services such as drugs, gambling, and sex work. If those estimates are anywhere near correct, they make organized crime the second-largest industry in the United States after the oil industry.

Even so, organized crime is probably not the largest part of the underground economy. The unreported income of businesses and self-employed people may add as much as $250 billion. That figure includes cash income that goes unreported to escape payment of taxes (for example, a concert pianist failing to report income from occasional piano lessons) and barter transactions that involve no cash at all. (For example, the pianist gets her teeth filled in exchange for giving piano lessons to her dentist's child.)

Even if the US underground economy amounts to as much as 10 percent of officially measured GDP, that proportion is moderate by world standards. Economists estimate that the French underground economy equals one-third of that country's GDP. For Italy, the figure may be as high as 40 percent. In some third-world countries, the official GDP data bear only a hazy relationship to what actually goes on in the economy.

6.4c Biases in Price Indexes

The accuracy of price indexes is the third problem for the national income accounts. The measurement of changes in price levels became a matter of growing concern as inflation increased in the late 1970s, and indexing and automatic cost-of-living adjustments became more widespread. If official price indexes overstate inflation, the adjustments may be too generous.

Specialists have identified two sources of bias that are of particular concern for the consumer price index. One arises from the way consumption patterns react to price changes, and the other from changes over time in the quality of goods and services.

Substitution Bias

The first reason that the consumer price index tends to overstate the true rate of increase in the cost of living is the so-called substitution bias. As we explained in *Applying Economic Ideas 6–1*, the CPI is a weighted average of the prices of goods purchased by urban consumers. The weights for calculating the index are the quantities of goods that made up the consumer market basket in some past year. However, because buying habits change over time, the weights typically are not those of the most recent year under observation.

If changes in buying habits were random, an obsolete set of weights would cause only random errors, not a systematic bias, in the CPI. The bias results from the way changes in relative prices affect demand. When prices change, people tend to buy less of goods that have become more expensive and more of those whose prices have risen less than average or have actually fallen. As a result, the CPI, which uses weights from the past, tends to overstate the increase in the cost of living because it assigns unrealistically large weights to products whose prices have increased.

For example, suppose the price of gasoline rises faster than the average of all consumer prices. If so, consumers buy more fuel-efficient cars, move closer to work, start using public transport, and take other steps to reduce their use of gasoline. That means that, quantitatively speaking, gasoline will have a lower weight in their current market basket than in the base-year market basket. As a result, the CPI will exaggerate the impact of gas prices on the cost of living.

The Bureau of Labor Statistics adjusts the market basket for the CPI every two years to reflect changes in buying patterns. It also makes certain technical adjustments to samples collected in different areas to try to reduce quantity bias. Those adjustments

reduce the substitution bias for the official CPI. In a further effort to minimize the substitution bias in the CPI, the Bureau of Labor Statistics now publishes a supplemental "chained" version of the CPI, which it calls C-CPI-U. That new measure has not yet been widely adopted as a basis for indexation, however.

One of the reasons that biases in the consumer price index are so important is that a variant of the CPI is used to index Social Security payments to tens of millions of older Americans. This issue is the subject of *Applying Economic Ideas 6–2*.

Applying Economic Ideas 6–2

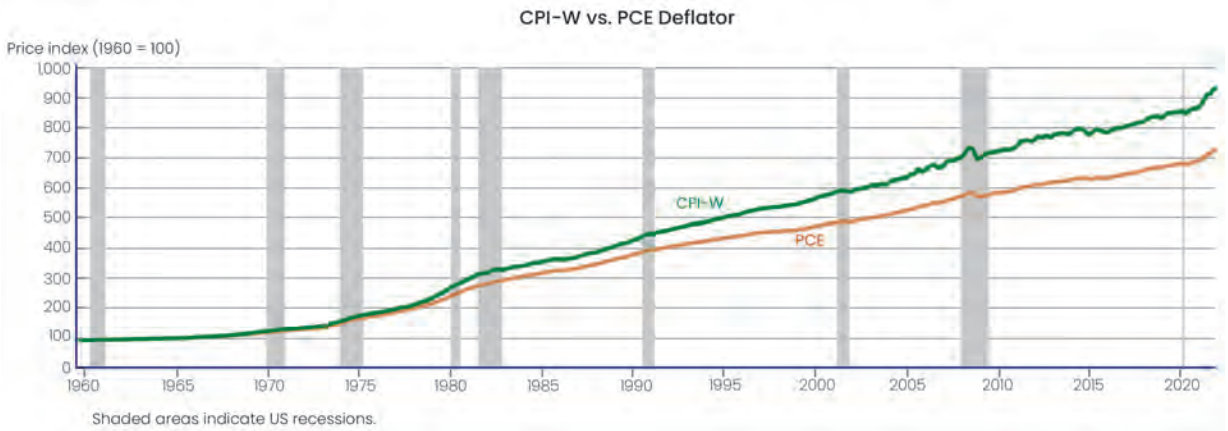
How Should We Index Social Security Payments?

Each month, tens of millions of elderly Americans receive payments from the Social Security Administration. For many of them, Social Security is their primary source of income. If Social Security benefits were not protected from inflation, their income security would be fragile, especially in 2021 and 2022—years with above-normal levels of inflation

In recognition of the threat that inflation poses to retirees, the Social Security Administration adjusts payments each year to reflect inflation. Rather than the more widely known CPI-U, which uses a market basket of goods consumed by all urban residents, the SSA uses the index CPI-W, which covers urban wage earners and clerical workers. In practice, the difference between CPI-W and CPI-U is very small.

Not all economists agree that CPI-W is the best basis for indexing Social Security payments. One problem is that the CPI-W is subject to substitution bias. If CPI-W overstates the true rate of increase in the cost of living, Social Security beneficiaries would become gradually better off over time at the expense of working-age people who pay the taxes that support the system.

One suggestion for correcting the situation would be to replace CPI-W with the deflator for personal consumption expenditures (PCE deflator) from the national income and product accounts. Because the PCE is a chained deflator and uses a current-year, rather than a base-year, market basket, it is relatively free of substitution bias. The chart shows that from 1960 to 2021, the cost of living (as measured by CPI-W) increased by about 28 percent more than it would have if it had been measured by the PCE deflator.



Data source: U.S. Bureau of Economic Analysis via Federal Reserve Bank of St. Louis.

(continues)

Because use of the PCE deflator would slow the growth of Social Security benefits, it has won favor with some policymakers who are concerned about the effect of rising entitlement spending on the federal budget deficit.

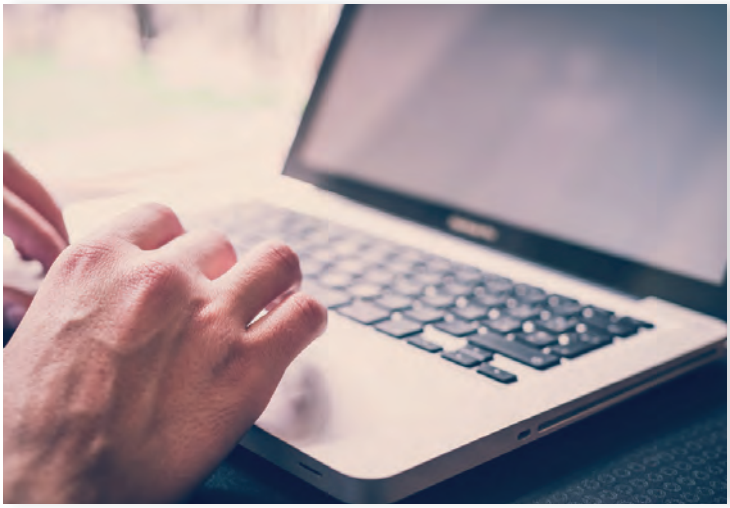
Not everyone agrees that switching Social Security indexation to the PCE deflator would be a good idea. Some advocates for the elderly deny entirely that CPI-W overstates the rate of increase in the cost of living for the elderly. On the contrary, they argue that the cost of living for senior citizens is increasing faster than that for the working-age population. The chief reason, they say, is that the elderly spend more on medical care, which has experienced faster-than-average inflation over the years.

Economists who take this position point to an experimental price index for the elderly called CPI-E. The Bureau of Labor Statistics does not publish CPI-E, but it makes it available for research purposes. Largely because it includes a larger weight for health-care services, CPI-E rises more rapidly than CPI-W (by about a third of a percentage point per year). However, serious methodological problems in measuring prices and quality for medical services have prevented wider use of the CPI-E, so far.

Quality Bias

A second source of bias in the consumer price index is the failure to adjust product prices for changes in quality. It would be highly misleading, for example, to say that a 2016 model car costs three times as much as a 1986 model without considering the fact that the new model requires less routine maintenance, uses less fuel, and is much safer than the old one. In terms of dollars per unit of transportation service, the newer model is clearly less than three times as expensive.

For automobiles, computers, and a few other major goods, the Bureau of Labor Statistics does try to make quality adjustments. To take an extreme case, as recently as the late 1960s, it cost over $1,000 to buy a desk-size electromechanical calculator that would add, subtract, multiply, and divide. Today, you can buy a very good laptop or smartphone for $1,000, and it will have many times the computing power of the 1960s-era computers used to send the Apollo astronauts to the moon. Official price indexes do, at least in part, incorporate those stupendous changes in computer quality; but government statisticians do not have the resources to make detailed studies of all items that enter into GDP.



(Shutterstock)

Laptops and smartphones today have the same price as an electromechanical calculator in the 1960s.

Taken together, the substitution bias and quality bias are substantial. At one time, they may have added 1.0 to 1.5 percent per year to the rate of inflation as measured by the CPI. Recent changes in methodology have reduced the bias, but it still probably amounts to 0.5 percent to 1.0 percent per year.

Perceptual Biases

Although economists argue that substitution and quality biases cause the official CPI to overstate the true cost of living, many people believe the opposite. Public opinion surveys show that, on average, people estimate the rate of consumer price inflation to be 2 percentage points or more higher than officially reported inflation. A significant minority of people think true inflation is 10 percentage points faster than the official rate. Why do so many people perceive rapid inflation, even when economists tell them that the cost of living is stable or rising only very slowly?

One reason is that when many people think of the cost of living, they want to know the changing cost of an unchanged basket of goods of unchanged quality. That question would be answered by a simple Laspeyres index, as explained in *Applying Economic Ideas 6–1*. However, the Bureau of Labor Statistics no longer uses a simple Laspeyres index. Instead, as we have seen, it makes adjustments to reduce the impact of quality and substitution biases.

Economists argue that the CPI, as now calculated, produces a more accurate measure of the changing cost of maintaining a given level of consumer welfare. However, the question, "How much would I have to spend to achieve last year's level of economic welfare?" is a different question from, "How much would I have to spend today to buy exactly the same stuff I bought last year?" To people who think that way, the government's attempt to measure the nebulous concept of economic welfare rather than the more tangible concept of an unchanged basket of goods and services looks like a conspiracy to fudge the numbers.

A second reason that people perceive a higher rate of inflation is a psychological principle called loss aversion. Loss aversion means that people feel more pain from a given loss than the joy they get from an equivalent gain. In simple terms, if you are leaning on the railing of a bridge, and your cell phone falls in the river, the pain you feel is greater than the joy you would feel if a stranger walked up to you unexpectedly and gave you a free cell phone. By the same token, if the price of gasoline goes up by $0.50 a gallon, and at the same time, the price of internet service goes down by enough to make your budget come out even, what you remember at the end of the month is the pain you feel at the gas pump—not the pleasure you get from the lower internet fee.

These and other biases—including the political biases of people who are simply unwilling to believe anything the government tells them—contribute to the tendency of people to perceive a higher rate of inflation than is officially reported.

6.4d Nonmaterial Sources of Welfare

The final problem with GDP is that it measures only material sources of welfare. That is hardly a surprise since that is the only thing it tries to do. Although we often use per capita GDP as a basis for comparing living standards over time and across countries, nonmaterial sources of welfare are important, too.

One key nonmaterial component of the standard of living is the quality of the environment. This not only varies widely from one place to another but has also changed greatly over time. The effects of climate change and toxic wastes are "bads" that, in principle, should reduce GDP just as "goods" add to it. Some economists also recommend adjustment of GDP for depletion of natural resources, such as oil fields and forests, much like adjustments for the capital consumption allowance.

A second nonmaterial source of welfare is the state of human health. By broad measures, especially that of life expectancy, standards of health in the United States appear to be improving. For example, since World War II, the life expectancy of a typical

45-year-old American has increased from 72 years to 77, and a 65-year-old American can now expect to live to the age of 81. This increase clearly improves human welfare, even if many of the added years of life occur after retirement, when people contribute little or nothing to measured GDP.

Education and literacy also contribute to human welfare, independently of income level. The United Nations Development Program publishes an index called the Human Development Index (HDI) that combines information on health, education, and literacy with real GDP. According to the HDI for 2017, Norway, Australia, and the Netherlands were among countries with the world's highest standards of living, with the United States among those in fourth place of the 190 countries studied. South Sudan, Central African Republic, and Niger were at the bottom of the list.

The HDI is hardly the last word in alternative measures of welfare. It contains no environmental component, except to the extent that environmental quality has an impact on health. The HDI also pays no attention to human rights, political freedom, or corruption—all of which are arguably important for human welfare. The Social Progress Index (covered in Chapter 4) is one attempt to include all of these elements in a comprehensive measure of well-being. The SPI confirms that people do not live by GDP alone. However, especially at low levels of economic development, there is a strong correlation between GDP per capita and other elements of human progress. Although there are many ideas about how to supplement it, there is little chance that anyone will find a replacement for GDP any time soon.

Summary

1. **How does the government measure gross domestic product?**

   The official accounts of the United States feature several domestic product concepts. Gross domestic product (GDP) is the value at current market prices of all final goods and services produced annually in a given country. Gross national product is the product produced by a country's factors of production, regardless of their location. Net domestic product is equal to GDP minus an allowance for consumption of fixed capital that reflects the value of capital goods worn out during the year.

2. **How does domestic income differ from gross domestic product?**

   Domestic income is the sum of wages and supplements, rental income of persons, corporate profits, and proprietors' income earned in a country. In principle, domestic income and gross domestic product should be equal; but in the official accounts, they differ because of the capital consumption allowance, indirect business taxes, and a statistical discrepancy that results from the use of different data sources for income and product measurements.

3. **What are the major types of international transactions?**

   Many types of transactions appear in the nation's international accounts. Exports less imports of goods constitute the merchandise balance. Adding services yields net exports of goods and services. Adding net international transfers (normally a negative number for the United States) yields the most widely publicized measure, the current account balance. In addition, the international accounts record financial inflows and outflows resulting from private financial transactions and official reserve transactions by the Federal Reserve and foreign central banks.

4. **How does the government measure inflation?**

   The GDP deflator is the broadest measure of the price level. It is the ratio of nominal GDP to real GDP in any given year. The consumer price index (CPI) includes only the market basket of goods purchased by a typical urban household. The producer price indexes (PPIs) include goods that business firms typically trade with each other.

5. **What are the limitations of official economic statistics?**

   The national income statistics of the United States are among the best in the world, but they are far from perfect. Problem areas include timeliness of data, the unobserved sector of the economy, price index biases, and nonmaterial aspects of the standard of living.

Key Terms

Problems and Topics for Discussion

1. Updating the national income accounts

The latest data on national income accounts and international transactions for the United States are available from the U.S. Department of Commerce, Bureau of Economic Analysis (http://bea.gov). Current and historical data for individual components, such as real and nominal GDP, investment, exports, and others, are available in both graphical and numerical formats from the FRED database maintained by the Federal Reserve Bank of St. Louis (https://research.stlouisfed.org/). If you plan to continue your study of economics beyond this introductory course, you will definitely want to become a friend of FRED! Use one of these sources to update the tables in this chapter and the charts in Chapter 4 to the most recent year or quarter. If you do not live in the United States, search the internet for similar data for your home country and compare them to the US data given in this chapter.

2. Inventory in the national income accounts

Suppose that a firm sells $10,000 worth of shoes that it has held in inventory for several years. What happens to GDP as a result? Which of its components are affected, and how?

3. International accounts

Following the pattern in Table 6–4, show how the international accounts might look for a year in which there was a $50 billion surplus on current account, no official reserve transactions, and no statistical discrepancy. What would the capital and financial account balance have to be?

4. The current account deficit

"A current account deficit is a very healthy thing. If we can get foreigners to give us real goods and services and talk them into taking pieces of paper in return, why should we want anything different?" Do you agree or disagree with this statement? Discuss.

5. Real and nominal quantities

In 1982 to 1984, the base period used for the consumer price index, the average earnings of construction workers were $442.74 per week. By 1989, the earnings of construction workers had reached $506.72 per week, but the consumer price index had risen to 124.0. What were construction workers' real earnings in 1989 stated in 1982–1984 dollars?

Case for Discussion

A Wishbook Journey into a Past Shopper's Fantasyland

The website WishbookWeb.com (https://bvtlab.com/H4hcf) archives full-color, page-by-page images of dozens of old mail order catalogs. They provide a vivid picture of how the price and quality of goods have changed over the generations. If you could jump through the screen for a day of shopping in one of these consumer fantasylands of the past, what would you bring home with you? What would you look at, laugh, and leave behind?

Start by jumping back to the Sears Christmas catalog for 1962 and comparing what you find there to items that were available to internet shoppers sixty years later, in 2022. How about a turtleneck sweater for $6.94, or a pair of fleece-lined leather gloves for the same price? Classic style, quality materials, and a price that seems quite reasonable today. You'd snap those up for sure.

Need a watch? The men's models are on page 164 of the catalog. There's a nice basic Timex for just $14.25. Good deal, huh? Oops! You have to wind it every day and probably set it forward or back a minute or two as well. Ah, there at the bottom of the page is the newest thing—an electric watch. Before you grab it, though, better check out recent offers from the online store at Timex.com. The 1962 model had a price of $43.95; in 2022 you could snag one for just a dollar more, and you can bet it keeps better time. So you won't come back from 1962 with a watch, after all.

How about a TV? Here's the top-of-the line 1962 model on page 200, a twenty-three incher for $189.95. And check this out: "Silicon rectifiers as used in military missiles provide great reliability and long life." Tempted? But . . . uh . . . "controls conveniently grouped on the front"? No remote? And color? Ya gotta be kidding! That was 1962!

Before you grab that Sears Silvertone beauty, consider what you could buy in the twenty-first century. In 2022, Amazon sells a twenty-four-inch flat-screen Fire TV model. Color? Yep. Remote? Yep. All your favorite streaming apps? You betcha. Oh, and the price? It's $20 cheaper than the 1962 model, at just $169.99.

OK, now you're back from your shopping trip. Time to take off those great gloves, slip into your classic turtleneck, and sit down in front of the TV to watch some politician ranting about how much better things were in the good old days before inflation ruined our lives!

Questions

1. How would you adjust the price of the 1962 TV to allow for the difference in quality from the 2022 model? Was it half as good? A tenth as good? Is it something you can even start to put a number on?
2. In 1962, the average hourly wage for US workers was about $2.50. In early 2022 it was about $26.92. Use those wage rates to convert all the prices in the story to hours of work. What would you buy from the 1962 Sears catalog if you had to work for the money at 1962 wages but could buy things now being sold by working at today's wages?
3. Spend some time with WishbookWeb.com. Check out some buys from the oldest catalogs, which date back to the 1930s. Take a look at a catalog from the 1980s. What would you buy from those catalogs? What would you not buy?

Endnotes

1 Following the same logic, it is also possible to calculate gross national product (GNP), a measure of goods and services produced by factors of production owned by a country's residents, including factors of production physically located in another country. Until the early 1990s, US accounts emphasized GNP rather than GDP. In practice, the difference between GDP and GNP is small for the United States.

2 The source for much of the material in this section is J. Steven Landefeld, Eugene P. Seskin, and Barbara Fraumeni, "Taking the Pulse of the Economy: Measuring GDP," *Journal of Economic Perspectives* (Spring 2008): 193–216.