

Chapter 8

MACROECONOMIC MEASUREMENT

Essentials of Economics in Context (Goodwin, et al.), 2nd Edition

Chapter Overview

In this chapter, you will be introduced to a fairly standard examination of national income accounting, but with a “contextual” flavor. You will learn that the accounts have been created for specific purposes, and that production and investment undertaken in the “household and institutions” and government sectors have historically been deemphasized in national accounting. The chapter explains what has been included in the measurement of the GDP, and what has been excluded. You will learn how economic growth, nominal GDP, real GDP, price indices, and unemployment, are commonly measured. The chapter then presents a more “contextual” analysis, giving a thorough introduction to social and environmental accounting and alternative measures of economic performance.

Chapter Objectives

After reading and reviewing this chapter, you should be able to:

1. Understand when the U.S. system of national accounts was developed, in the context of the pressing problems of that time.
2. Identify the four sectoral classifications of the U.S. national accounts, and what is included in each sector.
3. Define the Gross Domestic Product, identify what is included and excluded in its measurement, and apply the expenditure approach to measuring GDP.
4. Calculate GDP growth rates, nominal GDP, and real GDP.
5. Define the consumer price index, and calculate inflation rates.
6. Explain how employment and unemployment are officially measured, and why some analysts prefer measures of labor force utilization that differ from the official unemployment rate.
7. Understand the simplifying assumptions made by the traditional macroeconomic model, and identify the model’s basic identity (taken from the spending approach).
8. Understand why GDP does not measure well-being, and describe examples of alternative measures of economic well-being.
9. Identify the dimensions of well-being as described by the Sarkozy Commission.
10. Explain trends in subjective well-being data across countries and across time.
11. Understand the strengths and limitations of the various measures of well-being including the Genuine Progress Indicator, the Better Life Index, and the Human Development Index.

Key Terms

National Income and Product Accounts

Bureau of Economic Analysis (BEA)

depreciation

gross investment

net investment

gross domestic product (GDP)

imputation

final good

intermediate good

consumption

investment

government spending

closed economy

open economy

net exports

nominal (current-dollar) GDP

real GDP

base year

index number

inflation

GDP deflator

consumer price index (CPI)

Bureau of Labor Statistics (BLS)

civil noninstitutional population (BLS definition)

employed person (BLS definition)

unemployed person (BLS definition)

labor force (BLS definition)

“not in the labor force” (BLS definition)

unemployment rate

marginally attached workers

discouraged workers

underemployment

defensive expenditures

Green GDP

satellite accounts

subjective well-being (SWB)

Better Life Index (BLI)

Human Development Index (HDI)

Active Review

Fill in the Blank

1. The U.S. government agency that publishes statistics on production, income, spending, prices and employment is the _____.
2. The four sectors into which the U.S. national accounts are divided are the households and institutions sector, the business sector, the government sector, and the _____ sector.
3. Joe performed 15 hours of unpaid work on his family farm. He would be considered to be an _____ person, according to the BLS.
4. Rachael says she wants to work and is available for work. She has recently looked for work but is currently not doing so. The BLS would call Rachael a _____ worker. If she gives as her reason that she is no longer looking for work because there are no jobs for her, she would be considered a _____ worker.
5. A measure of welfare based on survey questions asking people about their own degree of life satisfaction is called _____.
6. Additional or parallel accounting systems that provide measures of social and

environmental factors in physical terms, without necessarily including monetary valuation, are called _____.

7. The index of well-being developed by the UNDP in 1990 that combines measures of health, education, and income is called the _____.
8. The measure of national production that subtracts both the depreciation of manufactured capital and the depreciation of natural capital is called _____.
9. To estimate the value of services from owner-occupied houses, the BEA uses the method of _____ by taking data from the rental housing market.
10. The measure of GDP that reflects the actual value of goods and service produced by removing the effect of changes in prices is called _____ GDP.

True or False

11. Often referred to as the “national accounts”, the National Income and Product Accounts (NIPA) includes statistics on production, income, and spending.
12. The unemployment rate is the percentage of the population that does not have paid employment, but is immediately available and actively looking for work.
13. Satellite accounts are a helpful way of measuring the monetary value of changes in a country’s environmental resources.
14. Average subjective well-being grows as rapidly as GDP per capita.
15. The Genuine Progress Indicator and the Gross Domestic Product both exhibit strong upward trends in the United States for the period 1950-2004.

Short Answer

16. When did the idea of creating a system of national accounts first take hold, and for what purpose? What were the concerns of that time? And who created them?
17. What are the three approaches to measuring GDP?

18. When measuring price levels in the economy (such as when calculating the CPI index), why is a weighted average used?
19. Why is it often said that the official unemployment rate tends to underestimate the true extent of unemployment in the economy?
20. Identify the categories that are added in, and those that are subtracted for, when calculating the GPI.
21. What might account for the deviations of the HDI rankings from the GDP? Why might a country like Sri Lanka have a lower level of GDP per capita than Namibia, and yet have a higher HDI ranking than Namibia?
22. What have been some justifications given for the historical exclusion of household production from the national accounts?

Problems

1. Determine which of the following would be counted in the spending approach of GDP, and which would not be counted. Identify the category under which it would fall (C, I, G, NX, or not counted).

- a. The housecleaning services of a stay-at-home mom.
- b. The housecleaning services of the “Merry Maids” company.
- c. The babysitting services of a babysitter whose earnings are kept “off the books” and not reported to the tax authorities.
- d. A brand new house built and sold this year.
- e. A new car made by Ford in the U.S., and sold to a household in the U.S.
- f. A new car made by Ford in the U.S., and sold in Mexico.
- g. Sale of a 2012 used Ford car.
- h. 3 shares of Ford Motor Company stock
- i. A new car made by Ford in the U.S. but not sold by the end of the year.
- j. A new car added to the fleet of taxis of Mr. Taxi Company.
- k. A new bridge to accommodate all the new and used cars and taxis on the road.

2. Assume a simple economy produces only two goods, corn and wheat. In the first year 100 bushels of corn are produced, and sold for \$3 a bushel. Also in the first year, 50 bushels of wheat are produced, and sold for \$5 a bushel. In the second year, 110 bushels of corn are produced, and sold for \$3.50, while 55 bushels of wheat are produced, and sold for \$5.50.

- a. Calculate the nominal GDP in year 1 and 2.
- b. Using the constant-dollar approach, calculate the real GDP in year 1 and 2. Take year 1 as the base year.
- c. Calculate the growth in real GDP between years 1 and 2 (with year 1 as the base year).

3. The U.S. labor force as of December 2023 was 167.5 million. There were 161.2 million employed, and 6.2 million unemployed. There were about 1.9 million in prison.
- Calculate the official unemployment rate.
 - If those 1.9 million people were not in prison, but were in the labor force and unemployed, calculate what the unemployment rate would be.

4. Counting the GPI

Suppose the economists in the country Greenland have been counting the GPI and currently have estimated Personal Consumption Expenditures to be \$1,000. They still need to account for the following entries. Finish the task for them, identifying whether the entries would be added or subtracted (or simply excluded) when measuring the GPI.

Personal Consumption Expenditures = \$1,000

		Added (+)	Subtracted (-)
National defense	\$100		
Spending on new bridges	\$25		
Net foreign borrowing	\$75		
Damage from crime	\$50		
Volunteer work in community centers	\$50		
Oil tanker accident	\$30		
Loss of wetlands	\$20		
Helping kids with homework	\$40		
Cooking of meals at home	\$30		
Cost of commuting	\$15		
Services of household washing machines	\$10		
You clean your own house	\$50		
Working overtime on Saturdays (in your paid job)	\$25		
Value of higher education	\$40		

Column Totals: _____

Total GPI: _____

Self Test

1. Which of the following would *not* be included in the households and institutions sector?
 - a. A non-profit hospital
 - b. The University of Michigan
 - c. The National Manufacturers Alliance, a non-profit institution serving for-profit manufacturers.
 - d. The Museum of Fine Art
 - e. The United Autoworkers, a trade union for the employees of automobile manufacturers.

2. Which of the following would *not* be included in the measure of U.S. GDP in the current year?
 - a. A new machine, made in the U.S. and purchased that year for the Ford motor company assembly line.
 - b. A Ford automobile newly produced that year in the U.S.
 - c. A Ford automobile, newly produced that year in the U.S. but unsold and sitting in a warehouse.
 - d. Three shares of Ford motor company stock purchased that year in the U.S.
 - e. The steel produced and sold that year to make a new Ford automobile.

3. Which of the following would *not* be counted as an addition in the measure of the U.S. GDP in the current year?
 - a. A car produced and sold in the U.S. by the Japanese-owned Toyota company.
 - b. A car produced in the U.S. by the U.S.-owned Ford motor company, and sold in Japan.
 - c. Restaurant meals in the U.S. sold to Canadian tourists visiting the U.S.
 - d. Restaurant meals in Canada sold to U.S. tourists visiting Canada.
 - e. A car produced in the U.S. by the Japanese-owned Toyota company, and sold in Canada.

4. In order to measure GDP by the spending approach, to highlight the portions that are considered to be consumption vs. investment, which identity should be used?
 - a. $GDP = \text{Personal consumption} + \text{Household savings} + \text{Business spending} + \text{Net foreign sector spending} + \text{Government spending}$
 - b. $GDP = \text{Personal consumption} + \text{Private investment} + \text{Net exports} + \text{Government consumption}$
 - c. $GDP = \text{Personal consumption} + \text{Private investment} + \text{Net exports} + \text{Government consumption} + \text{Government investment}$
 - d. b and c.
 - e. none of the above.

5. Which of the following would be included in the income approach to measure GDP?
- a. Wages and benefits, profits, rents
 - b. Wages and benefits, profits, investment spending
 - c. Wages and benefits, rents, investment spending, consumption spending
 - d. The value added in production
 - e. None of the above.
6. The price index that is most frequently reported in the news is the
- a. Consumer price index (CPI)
 - b. Producer price index (PPI)
 - c. Earnings index
 - d. The GDP deflator
 - e. Export price index
7. If the CPI increases from 440 to 480 from year 1 to year 2, the inflation rate is:
- a. 8.33%
 - b. 9.09%
 - c. 10%
 - d. 10.9%
 - e. 11.2%
8. To be considered employed by the BLS, you need to
- a. have worked for pay or profit at least 10 hours per week.
 - b. have worked for pay or profit at least 10 hours per week, or unpaid in a family-run business for at least 15 hours a week.
 - c. have worked for pay or profit for at least one hour per week.
 - d. have worked for pay or profit for at least one hour per week, or unpaid in a family-run business for at least 15 hours a week.
 - e. be registered at an employment agency.
9. Suppose the population is 300 million. There are 146 million employed, and 7.2 million unemployed. Then the unemployment rate is:
- a. 2.4%
 - b. 4.7%
 - c. 4.9%
 - d. 5.3%
 - e. There's insufficient data to determine the unemployment rate

10. According to the textbook, subjective well-being (SWB) tends to...
- a. increase as GDP per capita decreases.
 - b. increases as GDP per capita increases, but at a diminishing rate.
 - c. does not show any relationship with regard to GDP per capita.
 - d. increase as GDP per capita increases, and does so at an accelerating rate.
 - e. is better understood when contrasted with GDP rather than with GDP per capita.
11. Jane buys a package of cigarettes. While her purchase would show up in the national accounts as an increase in GDP, it is actually an example of
- a. a purchase of a well-being reducing product
 - b. a defensive expenditure
 - c. loss of leisure
 - d. loss of human and social capital formation
 - e. unequal distribution
12. Nancy has cut back her paid work hours to part-time and spends some of her extra time participating in her local community peace and justice group which engages in important community-building activities. While her decision to reduce her paid labor activities would show up as a decrease in GDP, it may actually increase well-being because it is an example of
- a. a well-being reducing product
 - b. a defensive expenditure
 - c. loss of leisure
 - d. a gain in human and social capital formation
 - e. a well-being reducing production method
13. Which one of the following items is *not* subtracted when calculating the GPI?
- a. cost of crime
 - b. lost leisure time
 - c. environmental costs
 - d. cost of homelessness
 - e. government spending on highways and streets
14. Which one of the following items is added in when calculating the GPI?
- a. cost of air pollutants
 - b. net exports
 - c. most government spending on goods and services
 - d. the services of consumer durables
 - e. paid domestic services

15. When tracking the trends in real GDP per capita and real GPI per capita from 1950 to 2004, what are the findings?
- a. Per capita GPI is lower than per capita GDP, and it has grown more slowly.
 - b. Per capita GPI is lower than per capita GDP, but it has grown more quickly.
 - c. Per capita GPI is higher than per capita GDP, and it has grown more quickly.
 - d. Per capita GPI is higher than per capita GDP, but it has grown more slowly.
 - e. Per capita GPI is about the same as per capita GDP, and they both have grown at about the same rate.
16. Which of the following is not accurate?
- a. The Better Life Index includes nearly a dozen dimensions of well-being.
 - b. The Better Life Index is more ambitious than the Genuine Progress Indicator.
 - c. The Better Life Index was launched by the Organization for Economic Cooperation and Development.
 - d. The Better Life Index includes more aspects of well-being than the Human Development Index.
 - e. All of these are accurate.
17. The HDI aggregates which three indicators in its index of well-being?
- a. GNI, adult literacy and education, life expectancy.
 - b. GNI, income inequality, and access to medical care.
 - c. GNI per capita, adult literacy and education, income inequality.
 - d. GNI per capita, adult literacy and education, life expectancy.
 - e. GNI per capita, access to medical care, life expectancy.
18. Which of the following best reflects the trends found in the HDI rankings?
- a. There is a strong correspondence between HDI and GDP per capita, as a high GDP per capita is always associated with a high HDI ranking, and vice versa
 - b. Although there is a rough correspondence between HDI and GDP per capita, some countries have low GDP per capita, yet high HDI rankings, and vice versa.
 - c. There is a weak correspondence between HDI and GDP per capita.
 - d. There is an inverse correspondence between HDI and GDP per capita, as countries with high GDP per capita have low HDI rankings, and vice versa.
 - e. There is no correspondence between HDI and GDP per capita.
19. Comparisons between GDP and HDI reveal that
- a. GDP is a good measure of well-being
 - b. GDP has significant shortfalls as a measure of well-being
 - c. The HDI has significant shortfalls as a measure of well-being
 - d. The GDP is a better measure of well-being than is the HDI
 - e. Neither the GDP nor the HDI can serve as measures of well-being

20. Which of the following is NOT a limitation of the GDP as a measure of well-being?

- a. It does not account for benefits of volunteer work.
- b. It neglects value of household production.
- c. It only values goods that are newly produced in the market.
- d. It does not account for economic inequality.
- e. Environmental costs, such as air and water pollution caused by economic activities is not accounted for by GDP.

Answers to Active Review Questions

1. The Bureau of Economic Analysis (BEA)
2. foreign
3. employed
4. marginally attached, discouraged
5. Subjective well-being
6. Satellite accounts
7. Human Development Index (HDI)
8. Green GDP
9. imputation
10. real (GDP)
11. True.
12. False. It is not the percentage of the population, but the percentage of the *labor force* who do not have paid jobs but are immediately available and actively looking for work.
13. False. Satellite accounts usually measure changes in the *quantities* of environmental resources, not changes in their monetary *values*.
14. False
15. False
16. The idea for the national accounts came during the Great Depression of the 1930s in the U.S., when decision-makers wanted to get a better sense of by how much economic production had fallen. Simon Kuznets was commissioned to produce the national accounts.
17. The three approaches are: the production approach, the spending approach, and the income approach.
18. Because we want to give greater emphasis to prices at which many transactions are made, and less emphasis to the prices of relatively minor goods and services.
19. Because discouraged workers and underemployed workers (involuntary part-time or workers not making use of their skills) are not counted among the unemployed in the official unemployment statistic.
20. The GPI adds in services from human, social, manufactured, and natural capital such as unpaid housework and parenting, higher education, volunteer work, the services of consumer durables, and net capital investment. It also adds the value of public goods and services such as the services of highways and streets. It subtracts defensive and regrettable expenditures and the social and environmental costs of

economic activities including the cost of crime, lost leisure time, underemployment, commuting, automobile accidents, household pollution abatement, water pollution, air pollution, noise pollution, loss of wetlands, loss of farmland, loss of primary forests, resource depletion, carbon dioxide emissions damage, cost of ozone depletion, net foreign borrowing, and the cost of consumer durables.

21. The deviations between the HDI and GDP rankings might be due to what is being produced in the country (e.g. spending on weapons that are used in wars rather than spending on health and education), and the unequal distribution of goods and services within a country. A country like Sri Lanka might have better social infrastructure and less of a gap between rich and poor than does Namibia.
22. Some reasons have included: a. households are not producing economic goods; b. it's too difficult to distinguish household production from consumption; c. GDP measures just market production; d; including household production would make too big of a change in the accounts.

Answers to Problems

1.
 - a. Not counted
 - b. Consumption
 - c. Not counted
 - d. Investment
 - e. Consumption
 - f. Net Exports
 - g. Not counted
 - h. Not counted
 - i. Investment
 - j. Investment
 - k. Government investment
2.
 - a. Nominal GDP in Year 1 = $(100 \times \$3) + (50 \times \$5) = \$550$
 Nominal GDP in Year 2 = $(110 \times \$3.50) + (55 \times \$5.50) = \$687.50$
 - b. The real GDP in year 1 = nominal GDP in year 1 = \$550
 The real GDP in year 2 = $(110 \times \$3) + (55 \times \$5) = \$605$
 - c. Growth in real GDP = 10%

3.

- a. Unemployment rate = (Unemployed / Labor force) * 100
= (6.2 million / 167.5 million) * 100 = 3.7%
- b. New unemployed population including 1.9 million people not in prison
= 6.2 million + 1.9 million = 8.1 million
New labor force = Employed + Unemployed
= 161.2 million + 8.1 million = 169.3
Unemployment rate = (Unemployed / Labor force) * 100
= (8.1 million / 169.3 million) * 100 = 4.78%

4. Counting the GPI

Personal Consumption Expenditures = \$1,000

		Added (+)	Subtracted (-)
National defense	\$100	Neither added nor subtracted. Excluded.	
Spending on new bridges	\$25	+25	
Net foreign borrowing	\$75		-75
Damage from crime	\$50		-50
Volunteer work in community centers	\$50	+50	
Oil tanker accident	\$30		-30
Loss of wetlands	\$20		-20
Helping kids with homework	\$40	+40	
Cooking of meals at home	\$30	+30	
Cost of commuting	\$15		-15
Services of household washing machines	\$10	+10	
You clean your own house	\$50	+50	
Working overtime on Saturdays (in your paid job)	\$25		-25 (loss of leisure)
Value of higher education	\$40	+40	

Column Totals	+245	-215
Total GPI (\$1000 + \$245 - \$215)		\$1,030

Answers to Self Test Questions

1. C
2. D
3. D
4. C
5. A
6. A
7. B
8. D
9. B
10. B

11. A
12. D
13. E
14. D
15. A
16. E
17. D
18. B
19. B
20. C