Measuring the aggregate economy

DIVIDING UP THE WORLD ECONOMY

Dividing up the world economy

- <u>Open and closed economies</u>
  - ➤ Closed economy: *When a domestic economy is studied in isolation from the rest of the world.*
  - ➤ Open economy: *We explicitly consider interactions with other countries.*
- <u>Measuring gross domestic product</u>

THE COMPONENTS OF GDP

The components of GDP

GDP accounting identity

$$Y = C + I + G + net(X)$$

Y: GDP
C: private consumption
I: Private investment
G: government purchases of goods and services

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TABLE 8-1 Expenditure Breakdown of GDP for Selected Countries

Country	GDP (U.S. $ in billions)	=	Consumption (% of GDP)	+	Investment (% of GDP)	+	Government Spending (% of GDP)	+	Exports (% of GDP)	−	Imports (−% of GDP)
United States	$14,265		$10,057		$1,996		$2,883		$1,861		−$2,883
			71%		14%		20%		13%		−20%
Belgium	376		51		23		23		89		−86
Czech Republic	248		47		38		20		70		−75
Germany	2,928		55		18		18		47		−41
Japan	4,294		55		25		18		18		−16
Mexico	1,480		66		26		10		28		−30
Poland	609		60		26		18		41		−45

Note: Percentages may not sum to 100 due to rounding. Data for United States and Germany are for 2008; 2007 for all others.

Source: *World Development Report*, 2009, The World Bank (www.worldbank.org), and *Survey of Current Business*, Bureau of Economic Analysis.

TABLE 8-2 U.S. National Wealth Accounts in 2008 (net worth)

	Dollars (in trillions)			Percentage of Component
Private net worth	$51.4			120%
Tangible wealth		$24.8		
Owner-occupied real estate			$20.5	40
Consumer durables			4.1	8
Other			0.2	0
Financial wealth		26.6		
Corporate equities			5.5	11
Noncorporate equities			7.5	15
Other (pension reserves, life insurance, etc.)			13.6	26
Government net financial assets	−8.6			−17
Federal		−6.4		−12
State and local		−2.2		−4
Total net worth	42.8			100

Source: *Flow of Funds Accounts*, Board of Governors, Federal Reserve (www.federalreserve.gov). The value of the government's financial liabilities is greater than the value of its financial assets, which is why it shows up as a negative percentage.

Is GDP Biased against Women?

Although in the example in the book the housespouse is a man, the reality is that most housespouses are women. The fact that GDP doesn't include the work of housespouses is seen, by some, as a type of discrimination against women who work without pay at home since their work is not counted as part of the domestic product. One answer for why it is not counted is that housework does not involve a market transaction and hence could not be measured. That makes some sense, but it does not explain why the services houses provide to homeowners are estimated and included in GDP. Why can't housework also be estimated?

The answer is that it can be estimated, and my suspicion is that not including housespouses' services in GDP does represent the latent discrimination against women that was built into the culture in the 1930s when national income accounting was first developed. That latent discrimination against women was so deep that it wasn't even noticed. Anyone who has seen the movie *Rosie the Riveter*, which shows government programs to get women out from wartime employment and back into their role in the home, will have a good sense of the cultural views of people in the mid-1900s and earlier.

In thinking about whether GDP is biased against women, it is important to remember that the concepts we use are culturally determined and, over time, as cultural views change, the concepts no longer match our changed views. There is no escaping the fact that language is value-loaded. But so, too, is our attempt to point out the values in language. There are many other ways in which GDP reflects arbitrary choices and discrimination against groups. The major discussion of the fact that latent discrimination against women is embodied in GDP accounting itself reflects our current values, just as not including housespouses' work reflected earlier values.

Because some production is used to replace worn-out plant and equipment (depreciation), this production is not available for purchase for consumption, investment, or government spending. To account for this, economists have created another aggregate term that adjusts for depreciation. That term is *net domestic product*. **Net domestic product (NDP)** is *GDP less depreciation*.

$$NDP = GDP - Depreciation$$

Because depreciation affects capital available for production, depreciation shows up in the investment category of expenditures. Specifically, investment we have talked about so far is gross investment; **net investment** is *gross investment less depreciation*.

Whereas gross domestic product measures the economic activity that occurs within the geographic borders of a country, the economic activity of the citizens and businesses of a country is measured by **gross national product (GNP)**—*the aggregate final output of citizens and businesses of an economy in a one-year period.* So the economic activity of U.S. citizens working abroad is counted in U.S. GNP but isn't counted in U.S. GDP.

$$GNP = GDP + \text{Net foreign factor income}$$

TABLE 8-3 Aggregate Income Breakdown for Selected Countries

(1) Country	(2) Aggregate Income (billions of $)	=	(3) Employee Compensation (% of total)	+	(4) Rents (% of total)	+	(5) Interest (% of total)	+	(6) Profits (% of total)
United States	$14,129		71%		1%		6%		22%
Japan	4,294		73		2		2		23
Germany	2,928		73		2		6		19
United Kingdom	2,213		62		4		3		30
Canada	1,270		68		8		6		18
Sweden	341		64		4		13		19

Note: Aggregate income in this table does not equal GDP in Table 8-1 because of statistical and conceptual adjustments. Percentages may not sum to 100 due to rounding. Data for the United States are for 2008. Most recent year available for all others.

Source: National Accounts, OECD, and individual country home pages.

Real and Nominal GDP

As stated earlier, to separate increases in GDP caused by inflation from increases in GDP that represent real increases in production and income, economists distinguish between **nominal GDP** (*GDP calculated at existing prices*) and **real GDP** (*nominal GDP adjusted for inflation*). This distinction is sufficiently important to warrant repetition in this chapter. To calculate real GDP, we create a price index (a measure of how much the price level has risen from one year to the next), divide nominal GDP by that price index, and multiply by 100. That price index is the GDP deflator, introduced in the previous chapter.[3] Thus, we have

$$\text{Real GDP} = \frac{\text{Nominal GDP}}{\text{GDP deflator}} \times 100$$

Rearranging terms, we can provide a formula for calculating the GDP deflator if you know both nominal GDP and real GDP:

$$\text{GDP deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$$

To see how these formulas can be used, say the price level rises 10 percent (from a GDP deflator of 100 to a GDP deflator of 110) and nominal GDP rises from $10 trillion to $12 trillion. Part of that rise in nominal GDP represents the 10 percent rise in the price level. If you divide nominal GDP, $12 trillion, by the new GDP deflator, 110, and multiply by 100, you get $10.9 trillion (the amount GDP would have been if the price level had not risen).
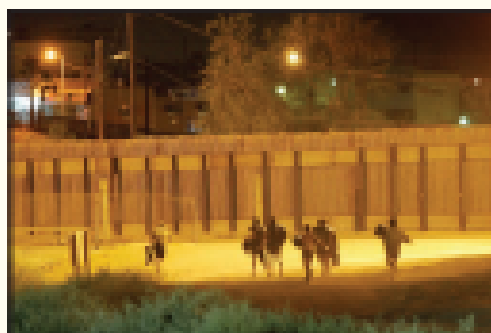
$$\text{Real GDP} = \frac{\$12}{100} \times 100 = \$10.9$$

	Nominal GDP	GDP Deflator	Real GDP
2006 level in billions	$13,178.4	116.7	$11,294.8
2007 level in billions	$13,807.5	119.8	$11,523.9
% change from '06 to '07	4.8	2.7	2.1
2008 level in billions	$14,264.6	122.4	$11,652.7
% change from '07 to '08	3.3	2.2	1.1

The Underground Economy and Illegal Immigration

In the text, we mentioned how the national income accounts fail to measure the underground economy and gave some examples of underground activities. One underground activity that has become increasingly important involves illegal immigration. Currently about 12 million people in the United States are undocumented workers, although the precise number isn't known since illegal immigrants aren't especially forthcoming when the government comes around to do a census study.

Most people in the United States are affected by this group. You can see them throughout the country in a variety of lower-level jobs such as maids, day laborers, construction workers, truckers, and farm laborers, among others. Many of these jobs are "on the books," which means that the undocumented workers have acquired a forged identity, with a Social Security number. They end up paying taxes and contributing to measured output even though they are illegal. Others work "off the books" and, like the many U.S. citizens who work off the books, their contribution to output does not show up in the national income accounts. Such "off the books" transactions occur when restaurants don't ring up cash sales or when waiters forget to declare tips on their tax returns—they reduce their tax payments and make it look as if they have less income and as if the economy has less production than actually exists.

How important is illegal immigration to the underground economy? While the standard measure is that there are about 12 million undocumented workers in the United States and that the underground economy is about 10 percent the size of the U.S. economy, some economists have estimated that the true number of undocumented workers is closer to 18 to 20 million, and that the underground economy is much larger than that 10 percent.

MEASURING WEALTH

Measuring wealth
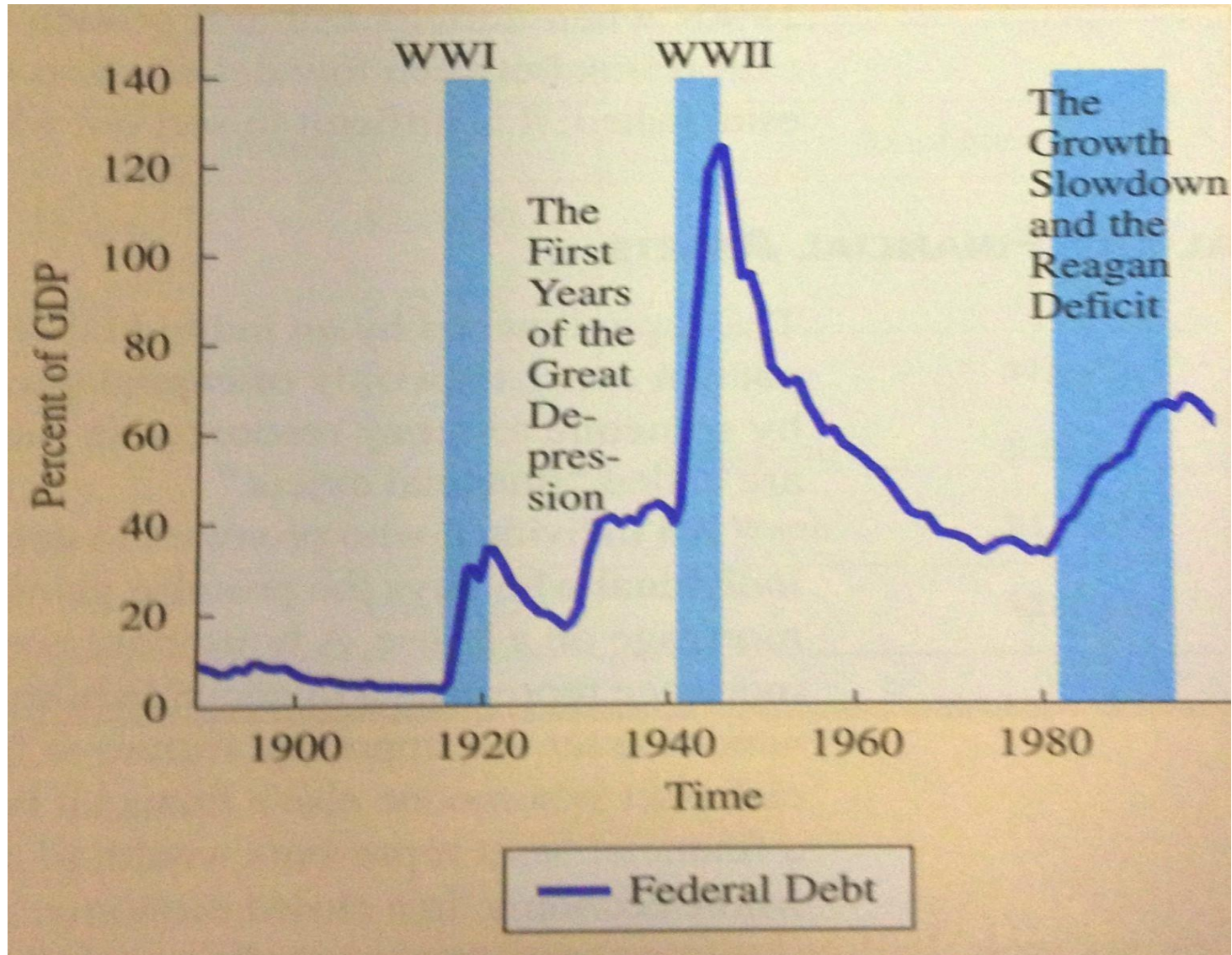
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Measuring wealth

- ## Balance Sheet accounting

John Chen			
Assets		Liabilities	
House	$250,000		
Car	$ 25,000		
Bank account		Mortgage	$150,000
		Auto loan	$ 15,000
		Net worth	$115,000
	$280,000		$280,000

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THE LINK BETWEEN GDP AND WEALTH

The link between GDP and wealth

- <u>**Growth rates and percentage changes**</u>

$$\text{Growth rate of GDP in year } t = \left(\frac{y_t - y_{t-1}}{y_{t-1}} \right) \times 100$$

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- <u>**Example:**</u>

In the country of Lilliput real GDP equals $11 billions in 2000 and $10 billions in 1999. Lilliput's GDP growth rate in 2000 was equal to:

$$\text{Growth rate of GDP in year } 2000 = \left(\frac{11 - 10}{10} \right) \times 100 = 10\%$$