GDP and National Accounts

"National accounts show technically no recession… … yeeah!"

Accounting (I)

Some Accounting Definitions …

• A **stock variable** is measured at one specific time, and represents a quantity existing at that *point in time*, which may have been accumulated in the past: e.g. U.S. nominal capital stock is the total value, in dollars, of equipment, buildings, inventories, and other real assets in the U.S. economy.

• A **flow variable** is measured over an interval of time. Therefore, a flow would be measured *per unit of time*: e.g. U.S. nominal GDP refers to a total number of dollars spent during a specific time period, such as a year.

Accounting (II)

… and more,

• The **national income** and **product accounts**, or **national accounts**, keep track of the flows of money between different sectors of the economy.

• **Consumer spending** is household spending on goods and services.

Financial Mkts.
• **Private savings** := disposable income minus consumer spending, is disposable income that is not spent on consumption.

• The **banking, stock**, and **bond markets**, which channel private savings and foreign lending into investment spending, government borrowing, and foreign borrowing, are known as the **financial markets**.

• A (financial) **stock** is a share in the ownership of a company held by a shareholder (e.g. IBM's stocks in the stock market).

• A **bond** is borrowing in the form of an IOU that pays interest.

• **Investment spending** is spending on productive physical capital, such as machinery and construction of structures, and on changes to inventories.

Accounting (III)

… and more.

GOVT.

• **Government transfers** are payments by the government to individuals for which no good or service is provided in return (retirement pensions, unemployment compensation, etc…).

• **Government purchases** of goods and services are government expenditures on goods and services.

• **Disposable income** := income plus government transfers minus taxes, is the total amount of household income available to spend on consumption and to save.

• **Government borrowing** is the amount of funds borrowed by the government in the financial markets.

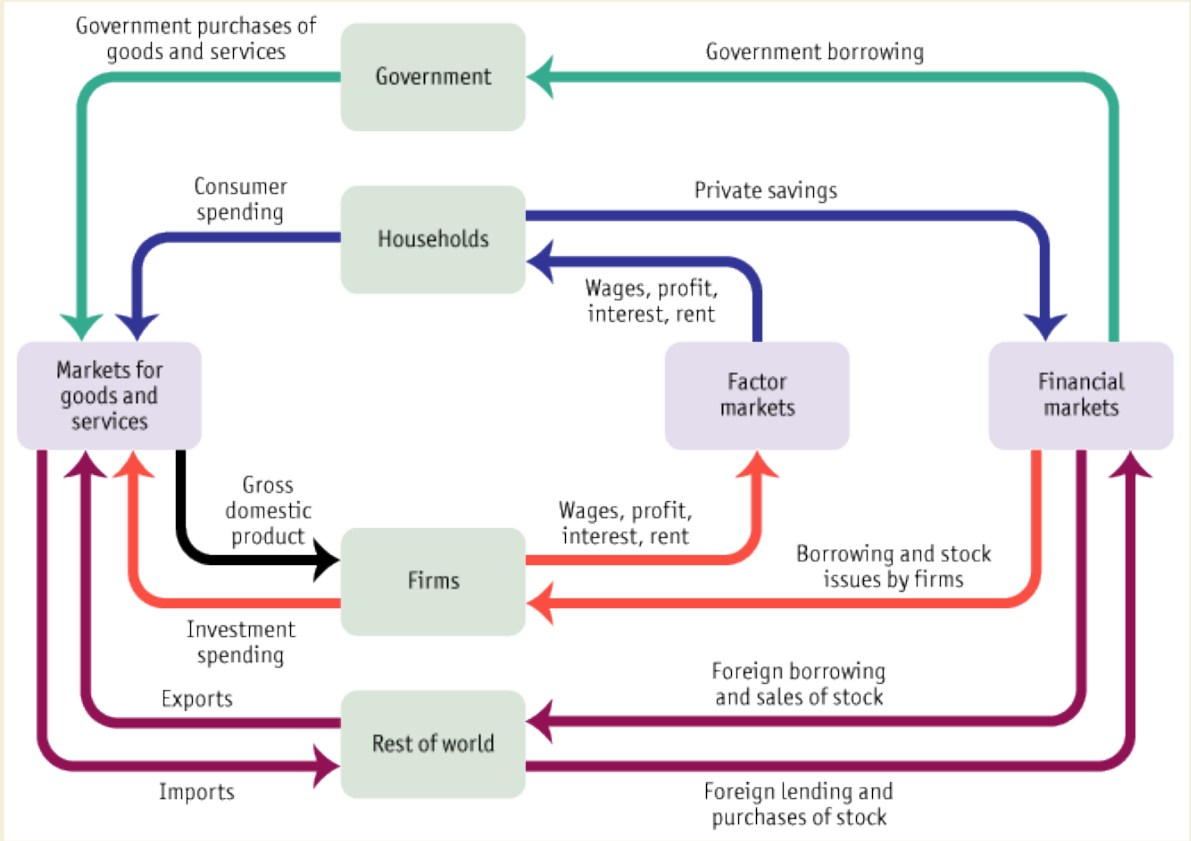
RoW.

• Goods and services sold to residents of other countries are **exports**; goods and services purchased from residents of other countries are **imports**.

National Accounts

The Circular-Flow Diagram

Figure 15-1 An Expanded Circular-Flow Diagram: The Flows of Money Through the Economy



National Accounts

An introduction to the GDP

• **Final goods and services** are goods and services sold to the final, or end, user.

• **Intermediate goods and services** are goods and services —bought from one firm by another firm— that are inputs for production of final (or new intermediate) goods and services.

• **Gross domestic product**, or **GDP**, is the total value of **all final goods and services produced in the economy** during a given year (output approach).

• **Aggregate spending** (the sum of consumer spending, investment spending, government purchases, and exports minus imports) is the **total spending** on domestically produced final goods and services in the economy (expenditure approach)

$$\text{Aggregate spending} = C + I + G + X - IM$$

The Gross Domestic Product (I)

Three ways to calculate it (I)

1) Measuring GDP as the Sum of the Value of Production of Final Goods and Services ("output approach")

• The value added of a producer is the value of its sales minus the value of its purchases of inputs (intermediate goods and services).

2) Measuring GDP as Spending on Domestically Produced Final Goods and Services ("expenditure approach")

• Another way to calculate GDP is by adding up aggregate spending on domestically produced final goods and services. That is, GDP can be measured by the flow of funds into firms. The following equation breaks GDP down by the four sources of aggregate spending:

$$GDP = C + I + G + X - IM$$

The Gross Domestic Product (II)

Three ways to calculate it (II)

3) Measuring GDP as Factor Income Earned from Firms in the Economy ("income approach")

• Another way to calculate GDP is to add up all the income earned by factors of production from firms in the economy: the wages earned by labor; the interest earned by those who lend their savings to firms and the government; the rent earned by those who lease their land or structures to firms; and the profit earned by the shareholders, the owners of the firms' physical capital.

The Gross Domestic Product (III)

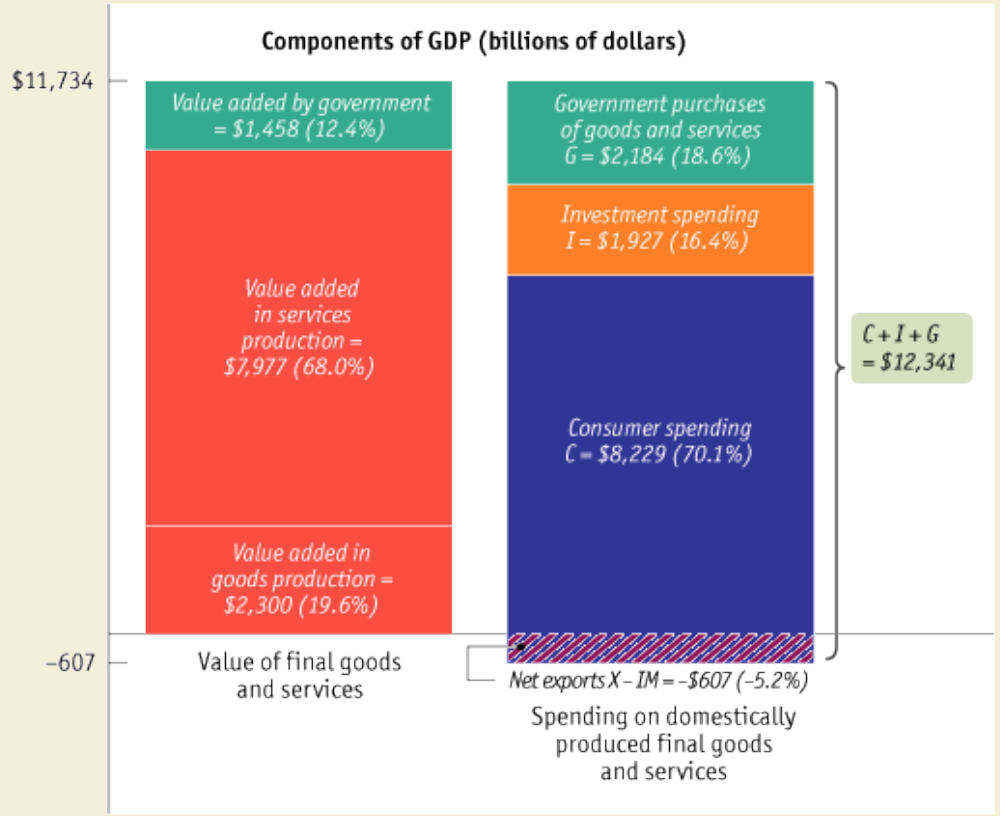
Example 1:

Figure 15-3

U.S. GDP in 2004: Two Methods of Calculating GDP

The two bars show two equivalent ways of calculating GDP. The height of each bar above the horizontal axis represents $11,734 billion, U.S. GDP in 2004. The left bar shows the breakdown of GDP according to the value added of each sector of the economy. From it we see that slightly less than 20% of GDP in 2004 came from the value added in the production of goods. The rest came from the value added in the production of services. The right bar shows the breakdown of GDP according to the four types of spending: C, I, G, and $X - IM$. The right bar has a total length of $11,734 billion + $607 billion = $12,341 billion. The $607 billion, shown as the area extending below the horizontal axis, is the amount of total spending absorbed by net imports (negative net exports) in 2004.

Source: Bureau of Economic Analysis.



The Gross Domestic Product (VI)

Drill 1:

Figure 15-2

Calculating GDP

In this hypothetical economy consisting of three firms, GDP can be calculated in three different ways: measuring GDP as the value of production of final goods and services, by summing each firm's value added; measuring GDP as aggregate spending on domestically produced final goods and services; and measuring GDP as factor income earned from firms in the economy.

Aggregate spending on domestically produced final goods and services = $21,500

	American Ore, Inc.	American Steel, Inc.	American Motors, Inc.	Total factor income
Value of sales	$4,200 (ore)	$9,000 (steel)	$21,500 (car)	
Intermediate goods	0	4,200 (iron ore)	9,000 (steel)	
Wages	2,000	3,700	10,000	$15,700
Interest payments	1,000	600	1,000	2,600
Rent	200	300	500	1,000
Profit	1,000	200	1,000	2,200
Total expenditure by firm	4,200	9,000	21,500	
Value added per firm = Value of sales – cost of intermediate goods	4,200	4,800	12,500	

Total payments to factors = $21,500

Sum of value added = $21,500

The Gross Domestic Product (V)

What GDP tells us

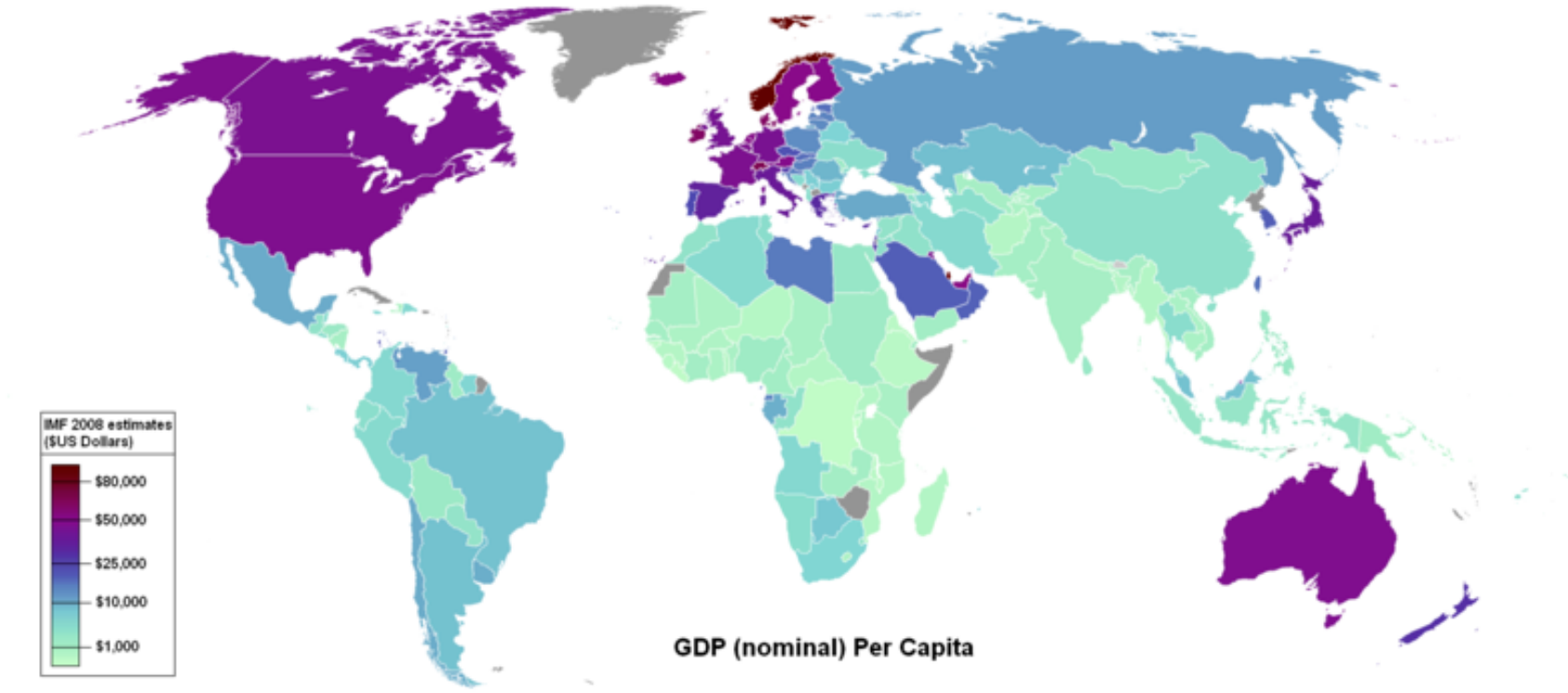
• The most important use of GDP is as a measure of the size of the economy, providing us a scale against which to measure the economic performance of other years, or compare the economic performance of other countries.

What GDP doesn’t tell us

• GDP per capita is GDP divided by the size of the population; it is equivalent to the average GDP per person. It is often used as a measurement of the standard of living in an economy, on the rationale that all citizens would benefit from their country's increased economic production.

The Gross Domestic Product (VI)

GDP (nominal) per capita world map IMF 2008



Components of the GDP (expenditure approach)

GDP = private consumption + gross investment + government investment + (exports - imports)

- Private consumption (**C**)= total value of consumer goods sold.

- Gross Investment (**GI**) or investment spending = Stock Investment (SI) + Gross Capital Formation (**GKF**)

- **SI** = total value of the production – total value of the production sold, during a period.
- **GKF** = New capital goods added to the productive process.
- = **NKF** + Depreciation of the capital (**D**).
- **NKF** = stock of the capital at the end of a period - stock of the capital at the beginning.

Components of the GDP (expenditure approach) (II)

GDP = private consumption + gross investment + government investment + (exports - imports)

Example:

	Production	Sales	Price
Raw materials	10	15	1
Capital goods	25	20	2
Consumer goods	75	70	5

- Fixed capital depreciation during the period: 10
- Stock level at the beginning of the period: 20

- Get the SI.
- Get NKF or (net investment in fixed capital).
- Get the stock level at the end of the period.
- Get the GDP.

Real GDP and Aggregate output (I)

Calculating Real GDP (I)

• The most important use of GDP is as a measure of the size of the economy, providing us a scale against which to measure the economic performance of other years, or compare the economic performance of other countries.

TABLE 1

Calculating GDP and Real GDP in a Simple Economy

	Year 1	Year 2
Quantity of apples (thousands)	2,000	2,200
Price of apple	$0.25	$0.30
Quantity of oranges (thousands)	1,000	1,200
Price of orange	$0.50	$0.70
(nominal) GDP (thousands of $)	$1,000	$1,500
Real GDP (thousands of year 1 $)	$1,000	$1,150

Real GDP and Aggregate output (II)

Calculating Real GDP (II)

• Real GDP is the total value of all final goods and services produced in the economy during a given year, calculated using the prices of a selected base year.

• Nominal GDP is the value of all final goods and services produced in the economy during a given year, calculated using the prices current in the year in which the output is produced.

• **Nominal growth and real growth (and inflation!):**
It turns out that there is a relationship between numbers and their growth rates that we can use to get some rules of thumb.
If A x B = C, then (approximately) growth rate of A + growth rate of B = growth rate of C.
If we think of the relationship between real GDP, the price index, and nominal GDP as:
Real GDP x Price Index = nominal GDP then growth rate of real GDP + growth rate of price index = (approx) growth rate of nominal GDP.

Real GDP and Aggregate output (III)

Calculating Real GDP (III)

TABLE 2

Nominal versus Real GDP in 1996, 2000, and 2004

	Nominal GDP (billions of current dollars)	Real GDP (billions of 2000 dollars)
1996	$7,817	$8,329
2000	9,817	9,817
2004	11,734	10,842

KEY TERMS

National income and product accounts (national accounts)
Consumer spending
Stock
Bond
Government transfers
Disposable income
Private savings
Financial markets
Government borrowing
Government purchases of goods and services
Exports
Imports
Investment spending
Final goods and services
Intermediate goods and services
Gross domestic product (GDP)
Aggregate spending
Value added
Net exports
Real GDP
Nominal GDP
GDP per capita
GDP deflator