Main concepts: The Economy's income and expenditure, the measurement of gross domestic product (GDP), The components of GDP, real versus nominal GDP, Consumer price index, Correcting economic variables for the effects of inflation.

1. The macroeconomics (Greek makro = 'big') describes and explains economic process that concern aggregates. An aggregate is a multitude of economic subjects.
   By contrast, microeconomics treats economic process that concerns individuals.
   Economic subjects: households, firms, and government.

2. Three Big Macroeconomic questions

   A. What Determines the Standard of Living?

The average income is the US is nearly $100 per day while others in Africa earn around $5 per day. The world average is around $20 per day. How does the standard of living increase? Why does the US have such a high standard of living?

B. What Determines the Cost of Living?

Prices in different Currencies: the cost of BMW x5 $50,000 in US but $100,000 in south Korea.

C. Why Does our Economy Fluctuate?

This chapter focuses on GDP as a measure of economy wide well being

Income and expenditure

GDP (gross domestic product) measures two things at once:

1. The total income of everyone in the economy
2. The expenditure on the economy's output of goods and services

Why?

Because for the economy as a whole, income must equal expenditure.

In markets for factors of production (inputs):
1. Households sell or rent labor, land, and capital. Their income equals GDP.
2. Firms buy or hire labor, and capital. Their wages rent and profit equal GDP.

In markets for good and services (outputs):
1. Firms sell goods and services. Their revenue equals GDP.
2. Households buy goods and services. Their expenditure equals GDP.

Measuring GDP

1. GDP is the market value of all final goods and services produced within a country in a given period of time.
2. GDP measures all goods in terms of their market value, in the common unit of dollars.
3. We can't compare apples and oranges. If an apple costs twice as much as an orange, then orange contributes twice as much to GDP.
4. Non-market activities like housework and childcare don't contribute to GDP.
5. Final good: it is sold to and used by user.
6. Good s and services: goods include cars, food, clothing… services includes haircuts, medical care.
7. GDP only includes newly produced goods.
   Buy a new car that contributes to GDP.
   Buy a used car that does not contribute to GDP.
8. **Within a country**:
   US GDP counts all goods and services produced in the US.
   A Canadian works in the US; her income counts in US GDP.
   A US citizen works in Canada; his income does not count in US GDP.
9. **In a given period of time**
   Usually within a quarter (3 months) or a year

The components of GDP

GDP can be decomposed into four components: consumption, invest, government purchases, and net exports.

$$Y = C + I + G + NX$$

1) Consumption
   Consumption is spending by **households** on:
   - Durable good(cars, appliances)
   - Nondurable good (food)
   - Services (haircuts)

2) Investment
Investment is spending by **firms** on goods that will be used in the future to produce more goods and service:
- Capital equipment (machines and tools)
- Structures (factories, office buildings)
- Inventories (goods produced but yet sold)

By convention, the purchase of a newly built house is a form of spending by households that is also included in investment.

Note that inventory accumulation is counted as investment:
- If Ford builds as $50,000 car in 2009, but the car sits in inventory through the end of the year, GDP and investment both rise by $50,000 in 2009
- Then, if the car is sold in 2010, consumption rises by $50,000 but investment falls by $50,000, since Ford's inventory is depleted GDP remains unchanged.
- **The car adds to GDP during the year it is produced (2009), not during the year it is sold (2010).**

Government Purchases

Government spending includes:
- Purchases of goods and services by federal, state, and local governments.
- Salaries of government workers.

Other forms of government disbursements, like social security payments, are called transfer payments and are **not counted in GDP**.

Net Export

Net exports equal:
- Exports: purchases of domestically (US) produced goods by foreigners.
- Minus imports: purchases of foreign goods by US households and firms.

Why are net exports included in GDP?
- Suppose that Boeing sells $100 million in airplanes to British Airways.

Conceptually, we want to include this $100 million in US GDP, since income is earned by a US firm.
And, consistent with this idea, the $100 million in exports get added to US GDP.

- But suppose tat you spend $100,000 on a new Porsche
  Conceptually, we would not want to include this $100,000 in US GDP, since the income is earned by a German firm.
- And, consistent with this idea:
  US consumption rises by $100,000, adding $100,000 to GDP.
  But US imports rise, subtracting $100,000 from net exports and also from US GDP.
  In the end, US GDP is left unchanged.

Real versus nominal GDP

If GDP rises from 1 year to the next, then either:

1. The economy is **producing more goods** and services, or
2. Goods and services are selling **at higher prices.**

We want to correct GDP for the effect of inflation.

Real GDP makes this correction, by valuing the goods and services produced this year at **constant prices** that prevailed during **a base year**.

Nominal GDP does not make this correction. It values the goods and services produced this year at **current prices** that prevail this year.

In economics, the **GDP deflator** (implicit price deflator for GDP) is a measure of the level of prices of all new, domestically produced, final goods and services in an economy.

GDP Deflator = (Nominal GDP / Real GDP) * 100

Now let's ask what happens when...

The quantities of all goods and services produced rise, but prices stay the same.

- Real GDP rises.
- Nominal GDP rises by the same mount.
- The GDP deflator stays unchanged.

The price of all goods and services rise, but quantities produced stay the same.

- Real GDP stays unchanged.
- Nominal GDP rises.
- The GDP deflator rises.

The percentage increase in the GDP deflator from one period to the next defines the rate of inflation.

Consumer price index (CPI)

The CPI is computed by the Bureau of Labor Statistics, a division of the Department of Labor, to measure the overall cost of goods and services bought by a typical consumer.

How to CPI is measured?

1. Survey consumers to determine the relevant "basket of goods"
2. Record the price of each good in each year
3. Compute the cost of the basket in each year
4. Choose a base year and compute the CPI for the current year.

CPI = (Cost of the Basket in the Current Year / Cost of the Basket in a Base Year) * 100

Inflation Rate =
[(CPI in Current Year - CPI in Previous Year) / CPI in Previous Year] * 100

Correcting economic variables for the effects of inflation

Dollar Figure at different points in time

Let's go back to the question from the beginning: after correcting for inflation, who was paid more, A ($80,000) in 1931 or B ($28 million) in 2007?

To answer this question, ask first: how many "baskets" of goods could A buy in 1931?

Number of Baskets Bought by A in 1931 =
$80,000 in 1931 / Cost of Each Basket in 1931

Now ask, how much would this same number of baskets have cost in 2007?

2007 Cost of the Baskets Bought by A in 1931
= Cost of Each Basket in 2007 * Number of Baskets Bought by A in 1931
= Cost of Each Basket in 2007 * ($80,000 in 1931 / Cost of Each Basket in 1931)

This last formula can be rewritten as:

2007 Cost of the Baskets Bought by A in 1931
= (Cost of Each Basket in 2007 / Cost of Each Basket in a Base Year) *100
* (Cost of Each Basket in a Base Year / Cost of Each Basket in 1931)
* 1/100 * $80,000 in 1931

But now it simplifies to:

2007 Cost of the Baskets Bought by A in 1931 □ (CPI in 2007 / CPI in 1931) * $80,000 in 1931

This equation is true more generally:

Value in this Year's Dollars = Value in a Past Year's Dollars * (CPI This Year / CPI in the Past Year)

It turns out that CPI in 1931 = 15.2
CPI in 2007 = 207
And so, doing the math:
Value of Ruth's Salary in 2007 Dollars = $80,000 in 1931 Dollars *(207 / 15.2) = $1,089,474
Even after adjusting for inflation, B's salary is much, much higher.

But, interestingly, president Herbert Hooever's 1931 salary was $ 75,000.
Let's convert that into 2007 dollars in the same way:

Value of Hoover's Salary in 2007 Dollars = $75,000 in 1931 Dollars * (207 / 15.2) = $1,021,382

After adjusting for inflation, his salary is more than twice as large as the $400,000 in 2007 by George W. Bush.

Indexation

Indexation refers to the automatic correction by law or contract a dollar amount for the effects of inflation.

As noted above, social security benefits are adjusted every year based on the percentage increase in the CPI.

Real and Nominal Interest Rates

Since bank accounts, bonds, automobile loans, and mortgages all require dollar payments at different points in time, the interest rates on these investments or loans must also be corrected for the effects of inflation to gauge their true economic significance.

Suppose, for example, that you deposit $1,000 in a bank account (interest 10% annual rate)

- One year from now, you will have $1,100: your original $1,000 + $100 interest
- But let's say that the inflation rate = 3%
- You have 10% more dollars, but those dollars buy 3% less.
- Your "real" return is actually 10% - 3% = 7%

In this example, the nominal interest rate (without correcting for inflation) is 10%.
But the real interest rate (with correcting for inflation) is 7%.

In general:

Real Interest Rate = Nominal Interest Rate - Inflation Rate

Note that the real interest rate can even be negative:
If the nominal interest rate on your bank account is 10%, but the inflation rate turns about to be 12%, the real interest rate is
10% - 12% = -2%
Which is bigger: the nominal interest rate or the real interest rate?

- **Under inflation**, the **nominal interest rate is bigger** than the real interest rate, since the value of dollar is falling over time.
- **Under deflation,** the **real interest rate is bigger** than the nominal interest rate, since the value of dollar is rising over time.