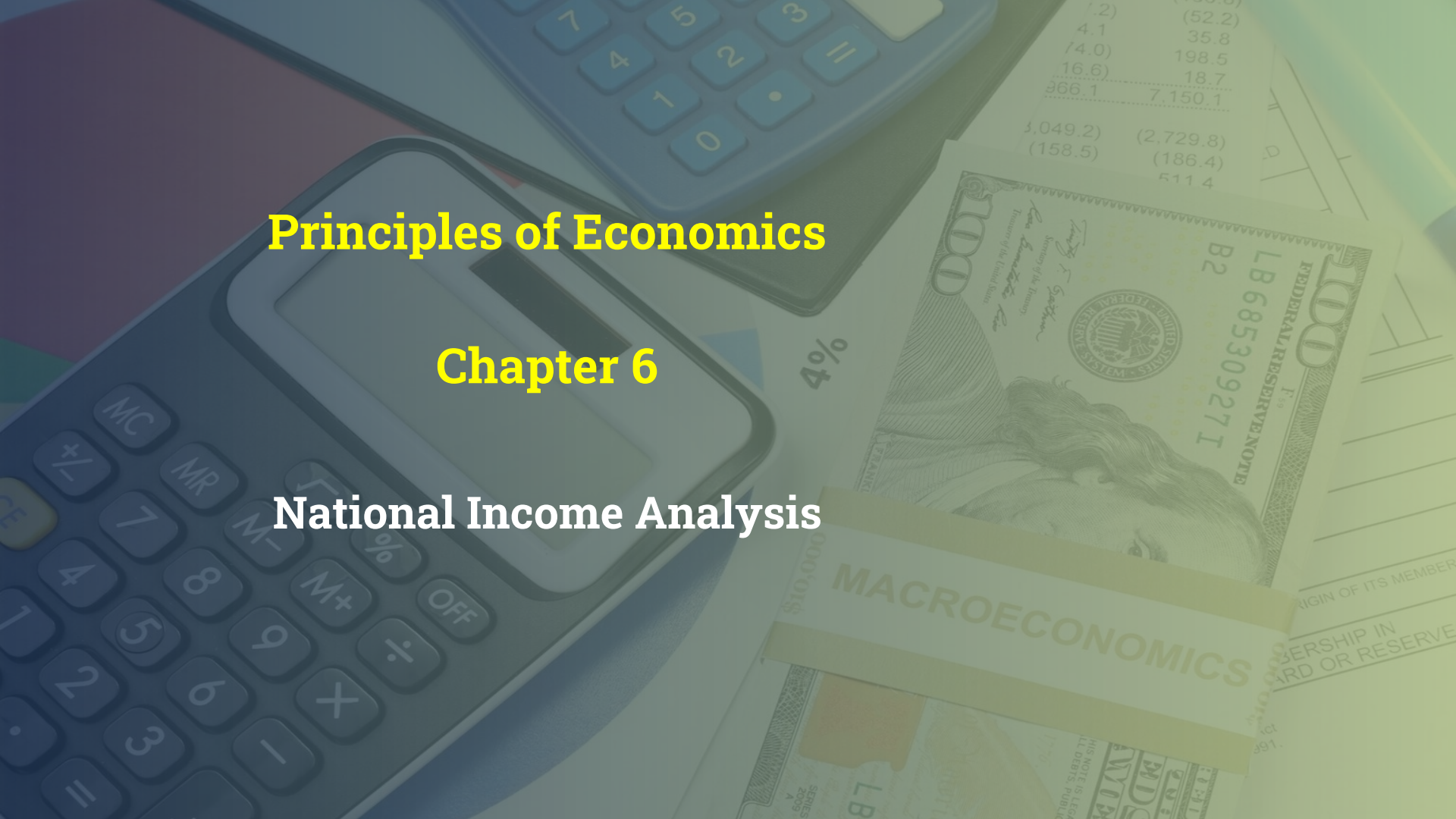
Principles of Economics

Chapter 6

National Income Analysis



What you will learn

What macroeconomics study

Roots of macroeconomics

Economic models

Data of macroeconomics

National income analysis

Key concepts

Macroeconomic Topics

Business cycle
Economic growth

Macroeconomic Models

Endogenous variables
Exogenous variables

Macroeconomic Variables

Gross National Product
Inflation
Unemployment

What macroeconomics study

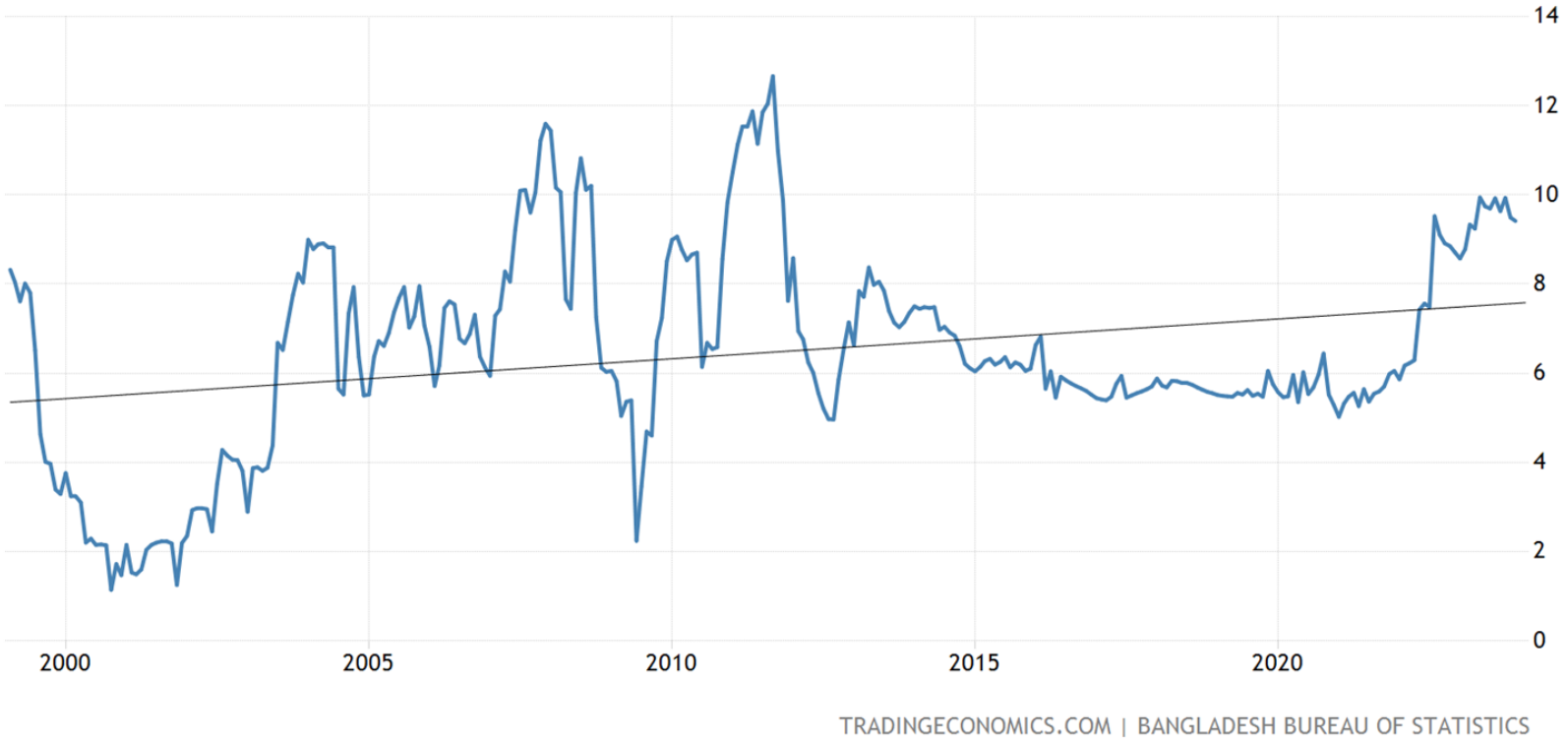
Why have some countries experienced rapid growth in incomes over the past century while others stay mired in poverty?

Why do some countries have high rates of inflation while others maintain stable prices?

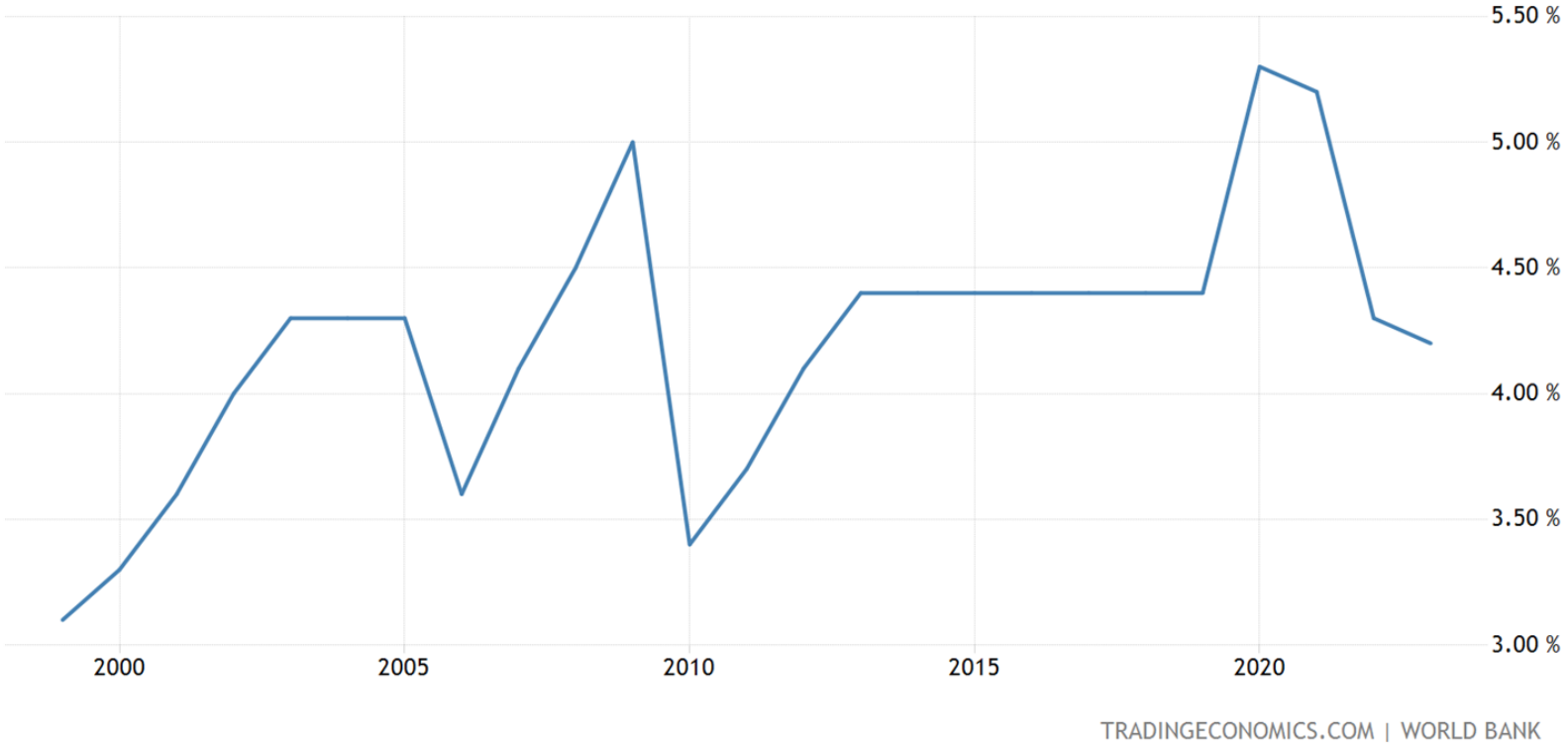
Why do all countries experience recessions and depressions—recurrent periods of falling incomes and rising unemployment—and how can government policy reduce the frequency and severity of these episodes?

Macroeconomics, the study of the economy as a whole, attempts to answer these and many related questions.

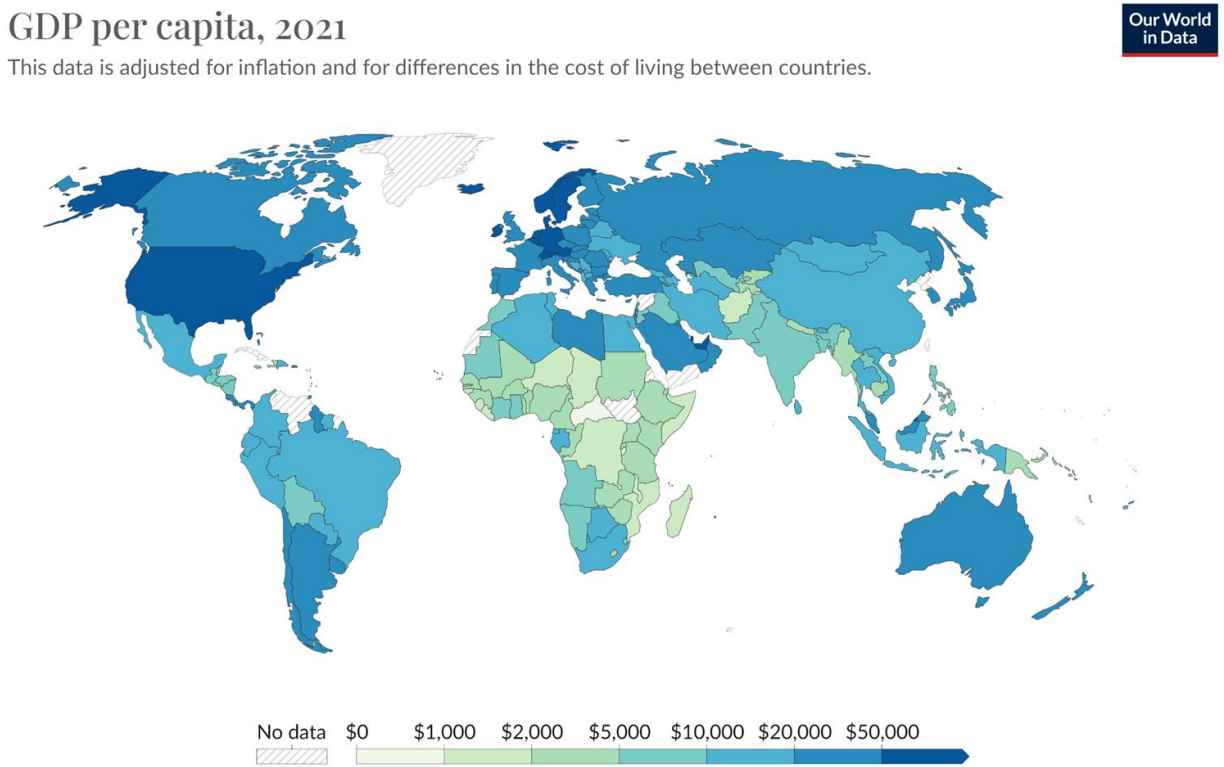
What macroeconomics study Bangladesh's annual inflation rate



What macroeconomics study Bangladesh's unemployment rate



What macroeconomics study World GDP per capita



What macroeconomics study World global exports

Roots of macroeconomics

Great Depression The period of severe economic contraction and high unemployment that began in 1929 and continued throughout the 1930s.

Classical economists applied microeconomic models, or “market clearing” models, to economy-wide problems.

Simple classical models failed to explain the prolonged existence of high unemployment during the Great Depression. This provided the impetus for the development of macroeconomics.


Open Idle Factories By Heavy Tax Condemnation

Unemployed Citizen

With which is combined THE VANGUARD

THE RAILROAD

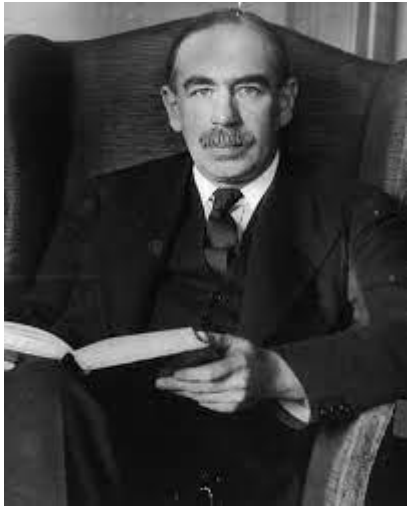
Strengthen the Voice of Seattle's Jobless!

Demand Grows For March on Olympia to Protest Pauper Plan

Unemployed To Lower Their Meagre Standard, Will Make Paupers

Roots of macroeconomics

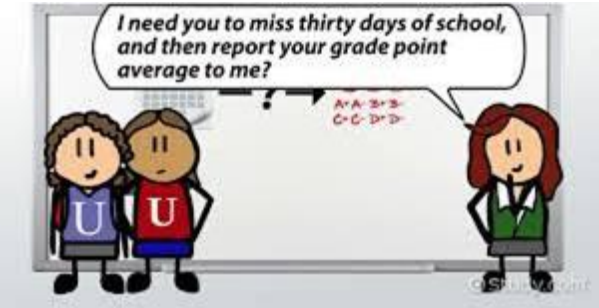
The Keynesian Revolution In 1936, John Maynard Keynes published *The General Theory of Employment*, *Interest, and Money*.

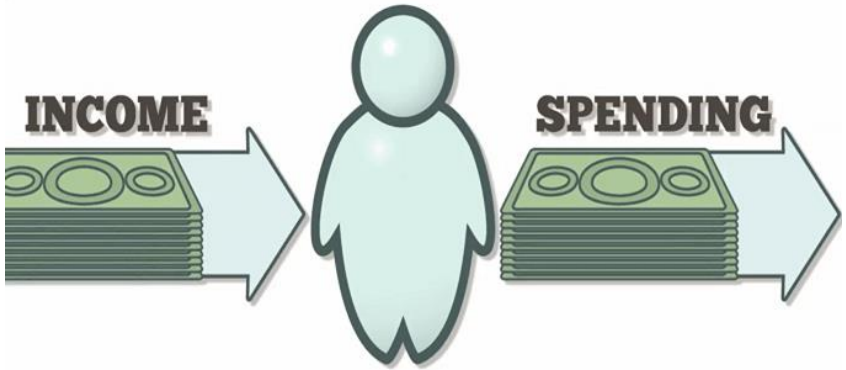


Much of macroeconomics has roots in Keynes's work. According to Keynes, it is not prices and wages that determine the level of employment, as classical models had suggested, but instead the level of aggregate demand for goods and services.

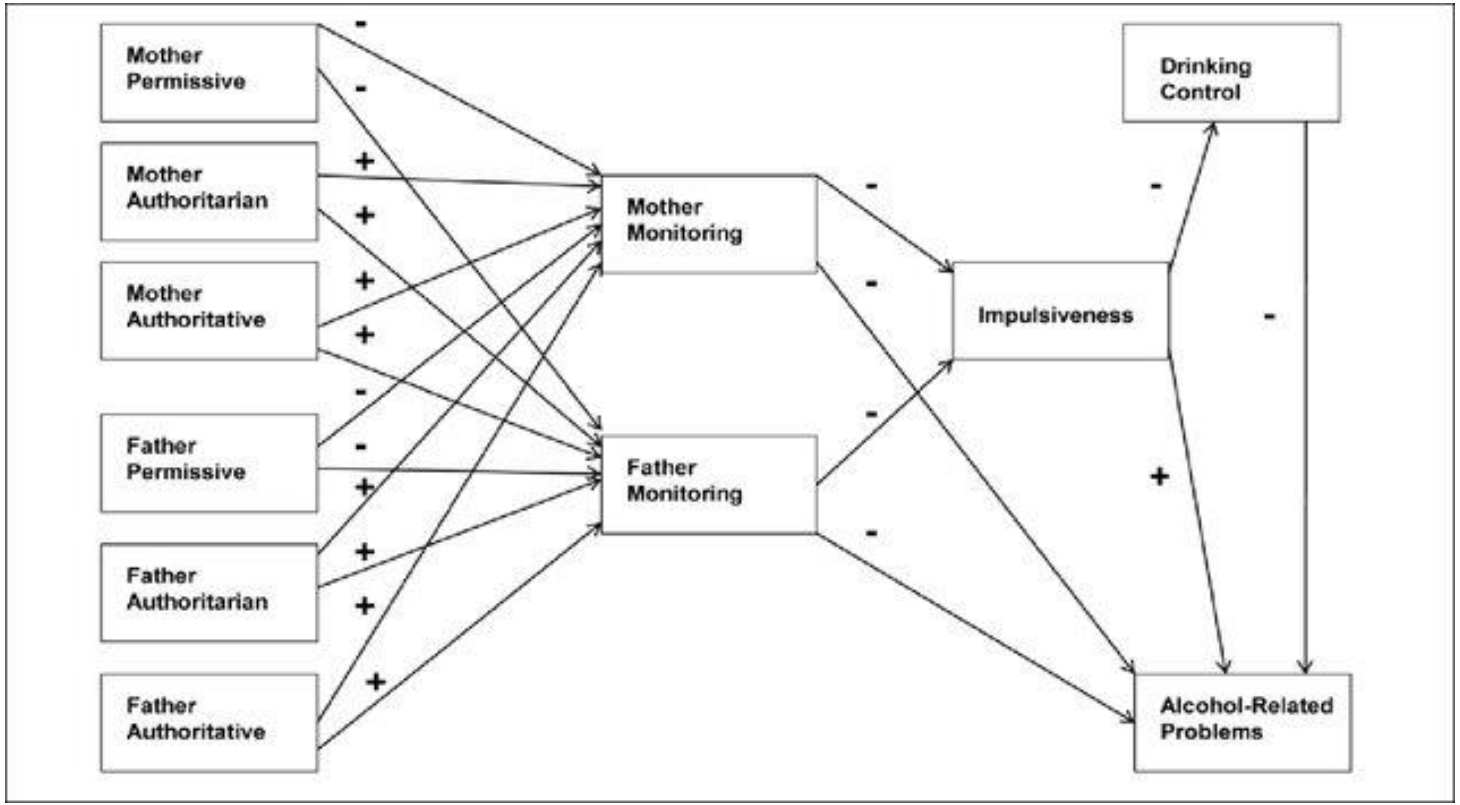
Economic models

How Models Work: Models are simplified theories that show the key relationships among economic variables. The **exogenous variables** are those that come from outside the model. The **endogenous variables** are those that the model explains. The model shows how changes in the exogenous variables affect the endogenous variables.





Identify exogenous and endogenous variables.



Data of macroeconomics

Three statistics that economists and policymakers use most often:

- Gross domestic product (GDP)
- Consumer price index (CPI)
- Unemployment rate

Gross Domestic Product

GDP is as the total income of everyone in the economy. Another way to view GDP is as the total expenditure on the economy's output of goods and services.

GDP is a gauge of economic performance. GDP measures something people care about—their incomes.

GDP is the market value of all final goods and services produced within an economy in a given period of time.

$$\begin{aligned} \text{GDP} &= (\text{Price of Apples} \times \text{Quantity of Apples}) \\ &\quad + (\text{Price of Oranges} \times \text{Quantity of Oranges}) \\ &= (\$0.50 \times 4) + (\$1.00 \times 3) \\ &= \$5.00. \end{aligned}$$

Gross Domestic Product

Economists call the value of goods and services measured at current prices nominal GDP. Notice that nominal GDP can increase either because prices rise or because quantities rise.

This measure does not accurately reflect how well the economy can satisfy the demands of households, firms, and the government. If all prices doubled without any change in quantities, nominal GDP would double. Yet it would be misleading to say that the economy's ability to satisfy demands has doubled, because the quantity of every good produced remains the same.

Economists use real GDP, which is the value of goods and services measured using a constant set of prices. That is, real GDP shows what would have happened to expenditure on output if quantities had changed but prices had not.

$$\text{Real GDP} = (\text{2009 Price of Apples} \times \text{2009 Quantity of Apples}) + (\text{2009 Price of Oranges} \times \text{2009 Quantity of Oranges}).$$

Similarly, real GDP in 2010 would be

$$\text{Real GDP} = (\text{2009 Price of Apples} \times \text{2010 Quantity of Apples}) + (\text{2009 Price of Oranges} \times \text{2010 Quantity of Oranges}).$$

Gross Domestic Product

From nominal GDP and real GDP we can compute a third statistic: the GDP deflator. The GDP deflator, also called the implicit price deflator for GDP, is the ratio of nominal GDP to real GDP. Nominal GDP measures the current dollar value of the output of the economy. Real GDP measures output valued at constant prices. The GDP deflator measures the price of output relative to its price in the base year.

$$\text{GDP Deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}}.$$

Gross Domestic Product: expenditure approach

Economists and policymakers care not only about the economy's total output of goods and services but also about the allocation of this output among alternative uses. The national income accounts divide GDP into four broad categories of spending:

- Consumption (C)
- Investment (I)
- Government purchases (G)
- Net exports (NX).

Thus, letting Y stand for GDP, **Y = C + I + G + NX**.

GDP is the sum of consumption, investment, government purchases, and net exports. Each dollar of GDP falls into one of these categories. This equation is an identity—an equation that must hold because of the way the variables are defined. It is called the **national income accounts identity**.

Gross Domestic Product: expenditure approach

Consumption consists of the goods and services bought by households. It is divided into three subcategories: nondurable goods, durable goods, and services.

Investment consists of goods bought for future use. Investment is also divided into three subcategories: business fixed investment, residential fixed investment, and inventory investment.

Government purchases are the goods and services bought by federal, state, and local governments. This category includes such items as military equipment, highways, and the services provided by government workers. It does not include transfer payments to individuals, such as Social Security and welfare. Because transfer payments reallocate existing income and are not made in exchange for goods and services, they are not part of GDP.

Net exports, accounts for trade with other countries. Net exports are the value of goods and services sold to other countries (exports) minus the value of goods and services that foreigners sell us (imports).

Gross Domestic Product: income approach

Income method of obtaining GDP is, **GDP = Total National Income + Sales Taxes + Depreciation + Net Foreign Factor Income**

- **Total National Income** = Sum of rent, salaries and wages, and profit.
- **Sales Taxes** = Tax imposed by a government on sales of goods and services.
- **Depreciation** = the decrease in the value of an asset.
- **Net Foreign Factor Income** = Income earned by a foreign factor like the amount a foreign company or foreign person earns from the country. It is also the difference between a country's citizens and country's earn.

To obtain **gross national product (GNP)**, we add receipts of factor income (wages, profit, and rent) from the rest of the world and subtract payments of factor income to the rest of the world: **GNP = GDP + Factor Payments from Abroad − Factor Payments to Abroad.** Whereas GDP measures the total income produced domestically, GNP measures the total income earned by nationals (residents of a nation).

To obtain **net national product (NNP)**, we subtract the depreciation of capital— the amount of the economy's stock of plants, equipment, and residential structures that wears out during the year: **NNP = GNP − Depreciation.**

Investment is expenditure on new plant and equipment, and it causes the capital stock to rise. Depreciation is the wearing out of old capital, and it causes the capital stock to fall. Depreciation is the **consumption of fixed capital** and refers to the amount of capital stock used up in the production process over a period.

Gross Domestic Product: production or value-added approach

Value is added at the time of production. It is also known as the reverse of the expenditure approach. Estimating the gross value-added total cost of economic output is reduced by the cost of intermediate goods used to produce final goods.

Gross Value Added = Gross Value of Output – Value of Intermediate Consumption

GDP = Sum of all value-added to products during the production of a process

Suppose a cattle rancher sells one-quarter pound of meat to McDonald's for $0.50, and then McDonald's sells you a hamburger for $1.50. Should GDP include both the meat and the hamburger (a total of $2.00), or just the hamburger ($1.50)? The answer is that **GDP includes only the value of final goods.** Thus, the hamburger is included in GDP but the meat is not: GDP increases by $1.50, not by $2.00.

What does GDP measure?

What does GDP measure?

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What does GDP measure?

What's not included in GDP?

ITEM	EXAMPLE
Illegal goods and services	A person buys an illegal substance or gambles/bets on a game
Legal goods and services with no record of the transaction	A gardener works for cash and no sales receipts exists.
Some non-market goods and services	A family member cooks, cleans, and cuts the lawn
Sales of used goods	A used car is bought
Stock transactions and other financial transactions	A 100 shares of stock is purchased
Government transfer payments	A person receives Social Security, welfare, unemployment

GDP does not-

- measure income distribution
- take into account leisure and environment
- measure social well-being
- measure standard of living

Which image describes inflation?

(a)

(b)

(c)

Consumer price index

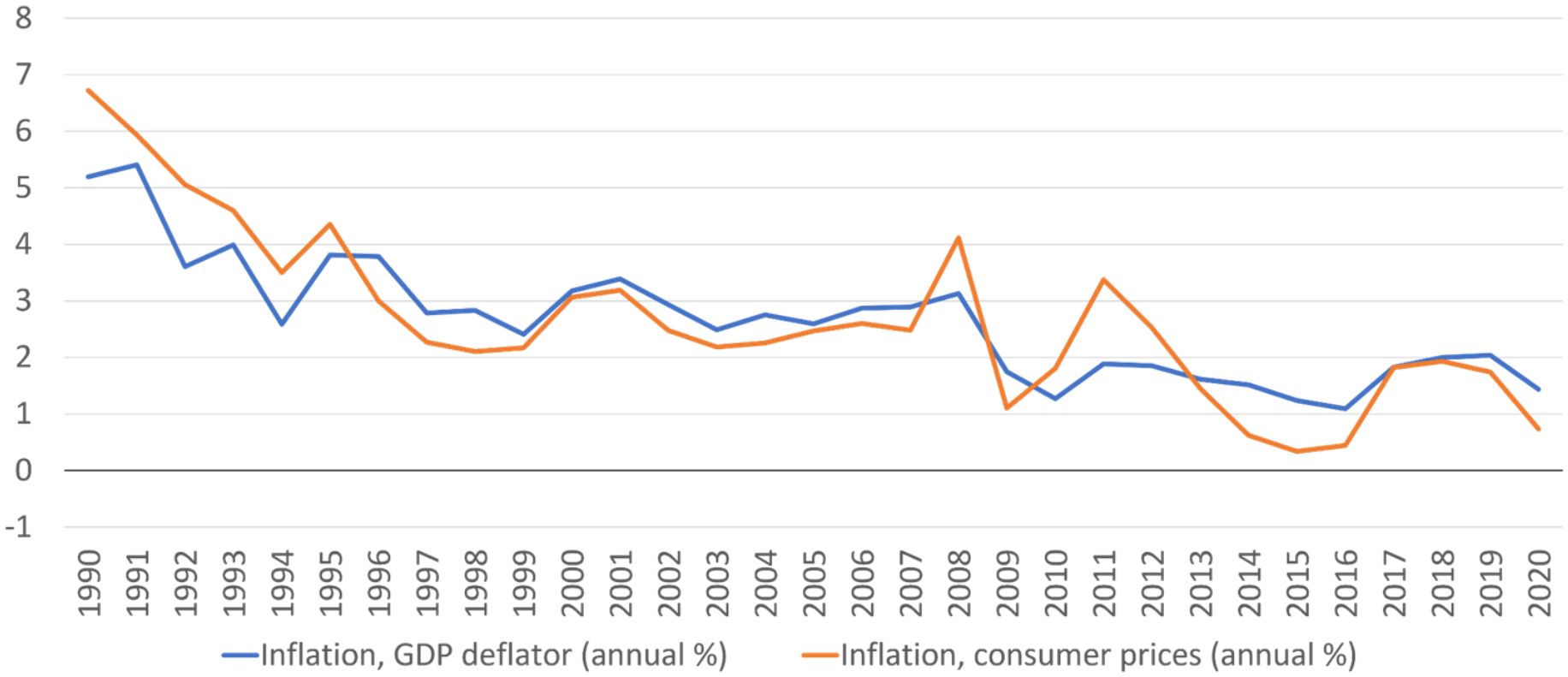
The most commonly used measure of the level of prices is the consumer price index (CPI). The CPI turns the prices of many goods and services into a single index measuring the overall level of prices. The CPI is the price of this basket of goods and services relative to the price of the same basket in some base year.

For example, suppose that the typical consumer buys 5 apples and 2 oranges every month. Then the basket of goods consists of 5 apples and 2 oranges, and the CPI is,

$$\text{CPI} = \frac{(5 \times \text{Current Price of Apples}) + (2 \times \text{Current Price of Oranges})}{(5 \times 2009 \text{ Price of Apples}) + (2 \times 2009 \text{ Price of Oranges})}.$$

In this CPI, 2009 is the base year. The index tells us how much it costs now (current year) to buy 5 apples and 2 oranges relative to how much it cost to buy the same basket of fruit in 2009.

OECD Inflation – Consumer prices vs. GDP deflator (annual %)



Source of data: World Bank

INOMICS

GDP Deflator

- Measures the prices of goods and services produced in an economy
- Uses changing weights based on current production
- Includes goods and services produced domestically
- Understates inflation
- Excludes imports
- Released quarterly (with GDP reports)

Consumer Price Index

- Measures the prices of goods and services consumed by households
- Uses a base year fixed basket of goods
- Includes goods and services purchased domestically and internationally
- Overstates inflation
- Includes imports
- Usually released monthly

Green GDP

is the measurement of GDP growth with the environmental consequences of that growth factored in.

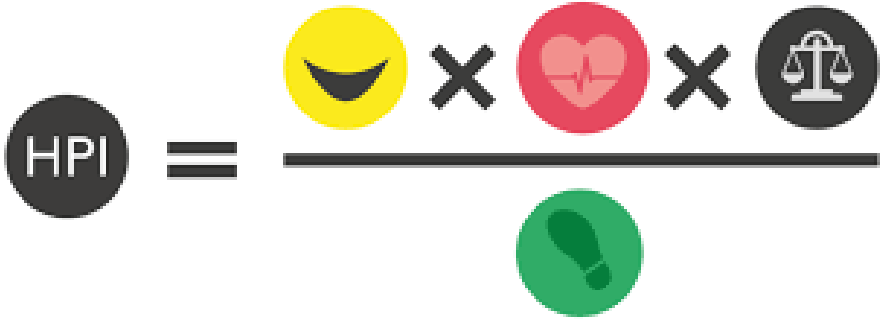
It means

- **Monetization of biodiversity loss**
- **Accounting for costs of climate change**
- **Subtracting resource depletion, environmental degradation from traditional GDP**
- **Helping to manage both economy and resources**

It does not mean

- Monetary value of forests and natural resources
- Growth of green investments

Happy Planet Index (HPI)



Wellbeing

Life expectancy

Inequality of outcomes

Ecological footprints

Finland is the happiest country in the world with a happiness index of 7.82. Finland's success can be attributed to its **strong social safety net, high levels of trust and freedom, and the ability to balance economic and social policies** effectively. The country is recognized for its **high-quality education system, gender equality, and overall peacefulness.**

Class task

Suppose people in a country consume 3 different goods. The following Table shows the prices and quantities of each good in 2015, 2016 and 2017.

Year	Fish		Chicken		Beef	
	Price ($)	Quantity (Kg)	Price ($)	Quantity (Kg)	Price ($)	Quantity (Kg)
2015	7	400	8	200	10	150
2016	8	500	7	300	12	200
2017	9	800	6	400	15	200

a) Calculate nominal GDP for each year.
b) Calculate real GDP for each year, using 2015 as the base year.
c) Calculate the GDP deflator for each year.