Unit 1

Macroeconomic Accounts

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Slides prepared by Stefania Rossi, using various sources listed at the end of the presentation.

The plan

- Macroeconomics vs Microeconomics
- Economic models/endogenous and exogenous variables
- Macroeconomic variables
- Gross Domestic Product (GDP)
- Real and nominal GDP, GDP deflator, CIP index
- Inflation
- Unemployment
- Flows of Income and Expenditures
- Balance of Payment

Macroeconomics vs Microeconomics

Macroeconomics: the study of the economy as whole

Microeconomics: Studies individual units of the economy; it studies the behavior and decision-making of individual economic units such as consumers, firms, and households, and how they interact in markets to determine prices, output, and the allocation of resources

Macroeconomics, the study of the economy as a whole, addresses many topical issues, *e.g.*:

How is income generated and distributed within a nation?

What causes recessions? What is "government stimulus" and why might it help?

How can problems in the housing market spread to the rest of the economy?

What is the government budget deficit?

How does it affect workers, consumers, businesses, and taxpayers?

Macroeconomics, the study of the economy as a whole, addresses many topical issues, *e.g.*:

Why does the cost of living keep rising?

Why are so many countries poor? What policies might help them grow out of poverty?

What is the trade deficit? How does it affect a country's well-being?

Economic Models

…are simplified versions of a more complex reality
- irrelevant details are stripped away

…are used to
- show relationships between variables
- explain the economy's behavior
- devise policies to improve economic performance

Example of a model: Supply and demand for new cars

Shows how various events affect the price and quantity of cars

Assumes the market is competitive: each buyer and seller is too small to affect the market price

Variables

- Q^d = quantity of cars that buyers demand
- Q^s = quantity of cars that producers supply
- P = price of new cars
- Y = aggregate income
- P_s = price of steel (an input)

The demand for cars

Demand equation: $Q^d = D(P, Y)$

Shows that the quantity of cars consumers demand is related to the price of cars and aggregate income

Digression: Functional notation

General functional notation
shows only that the variables are related.

$$Q^d = D\,(P, Y)$$

A list of the variables that affect Q^d

A **specific functional form** shows the precise quantitative relationship.

Example:

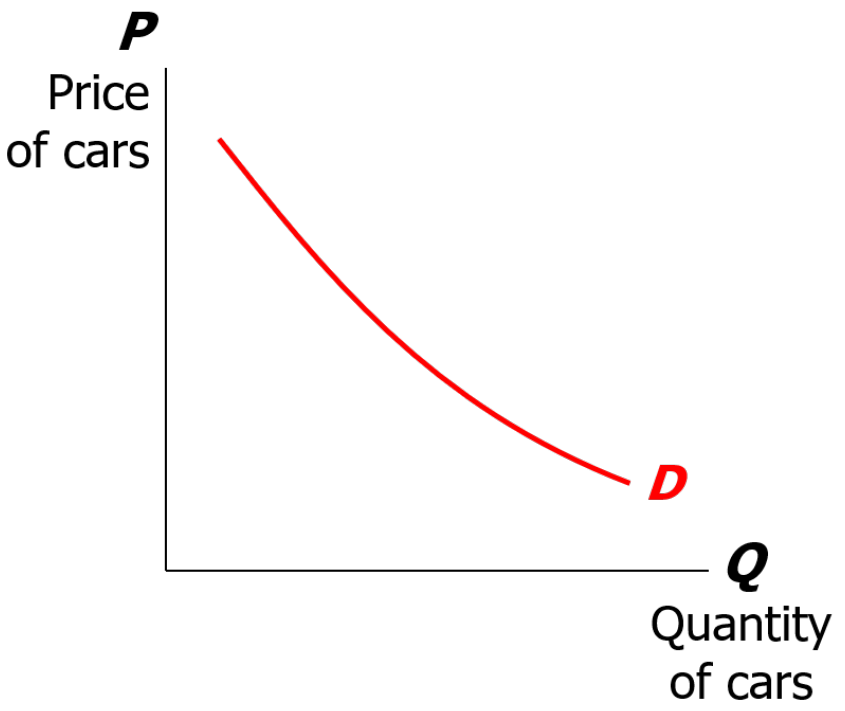
$D\,(P, Y) = 60 - 10P + 2Y$

The market for cars: Demand

Demand equation:

$$Q^d = D\,(P, Y)$$

The **demand curve** shows the relationship between quantity demanded and price, other things equal.

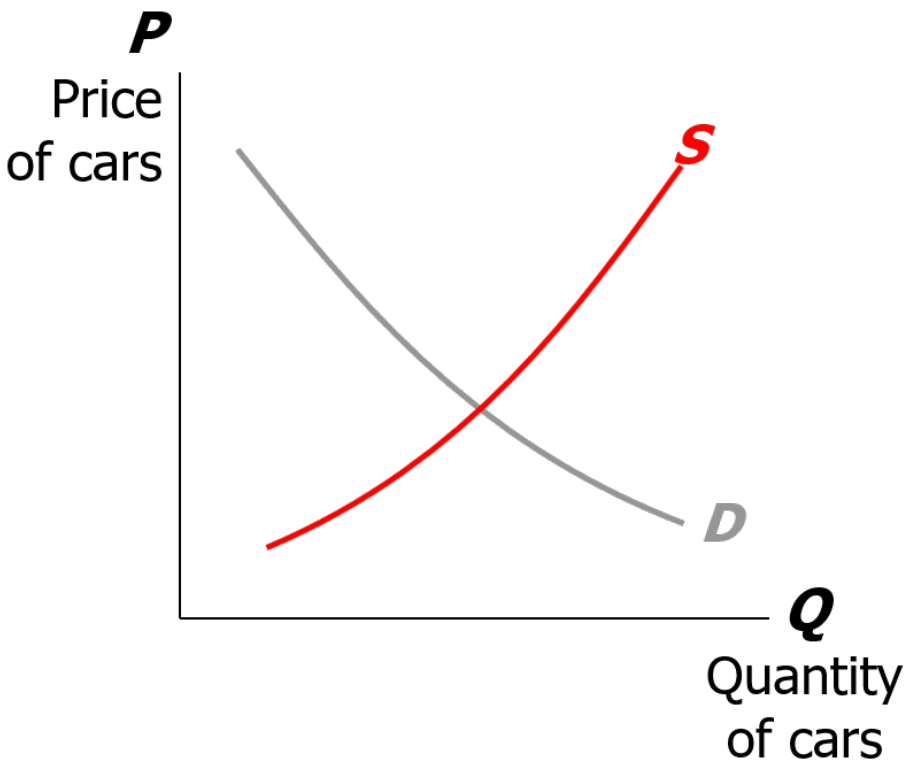


The market for cars: Supply

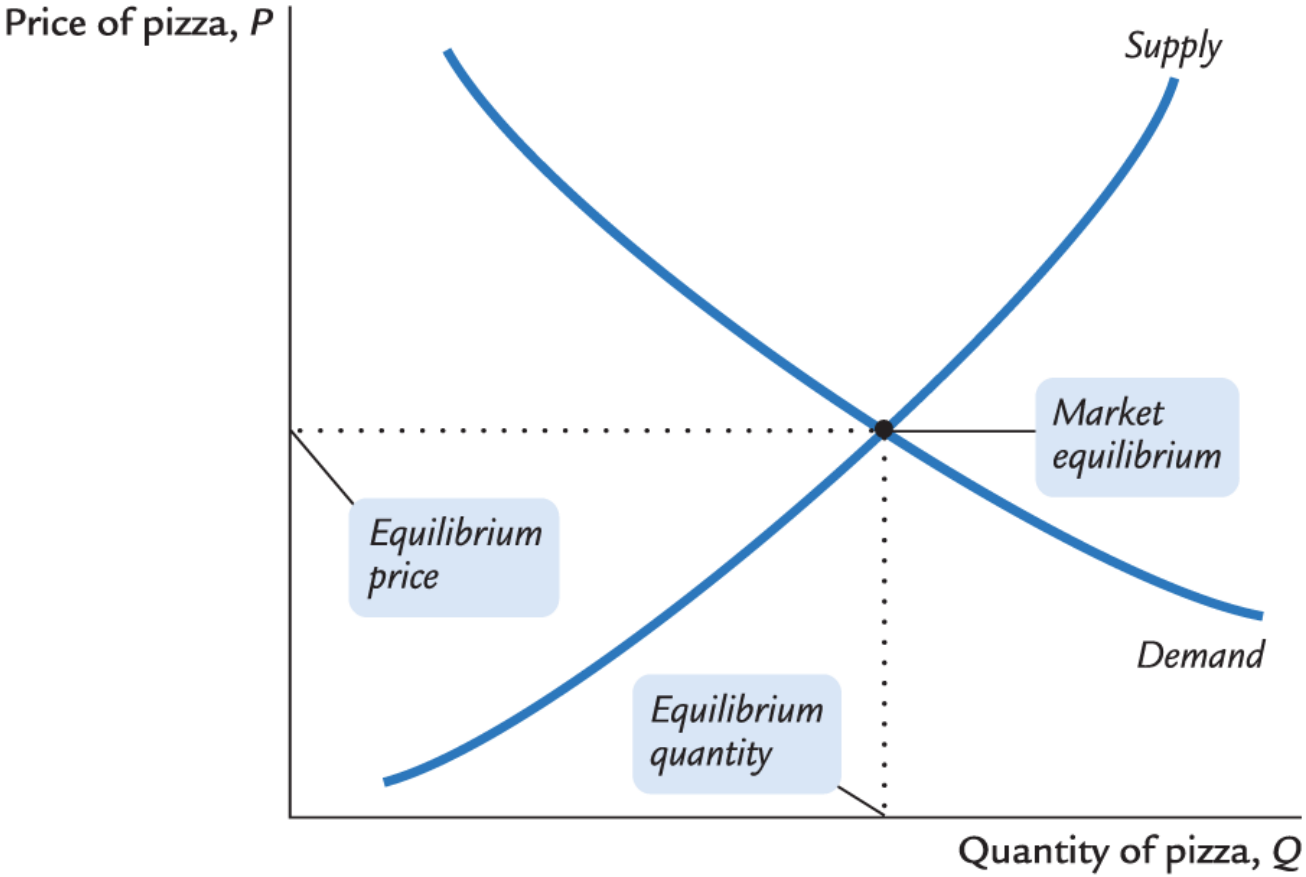
Supply equation:

$$Q^s = S\,(P, P_S)$$

The **supply curve** shows the relationship between quantity supplied and price, other things equal.



The market for cars: Equilibrium



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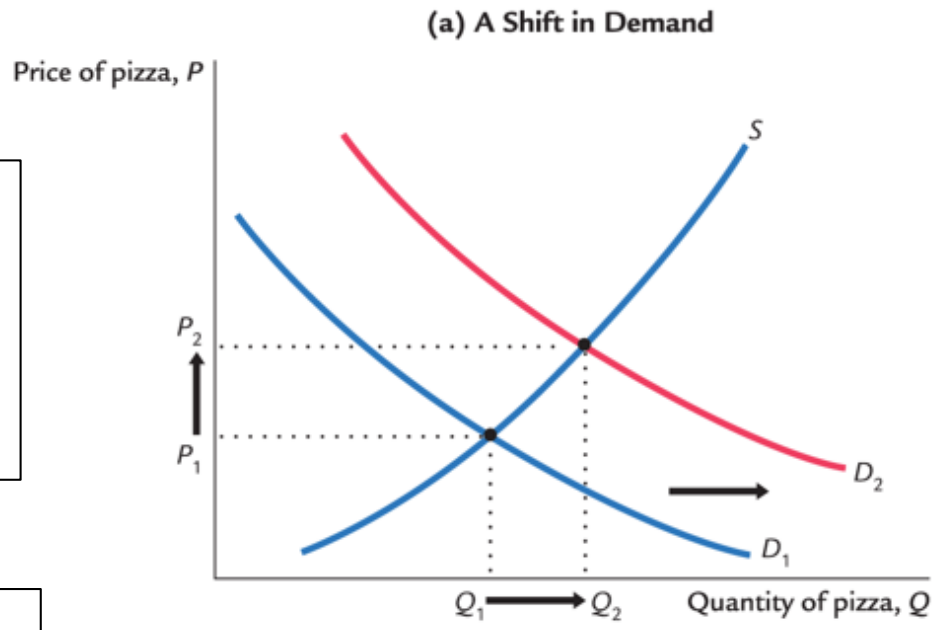
The effects of an increase in income

Demand equation:

$$Q^d = D\,(P, Y)$$

An increase in income increases the quantity of cars consumers demand at each price…



…which increases the equilibrium price and quantity.

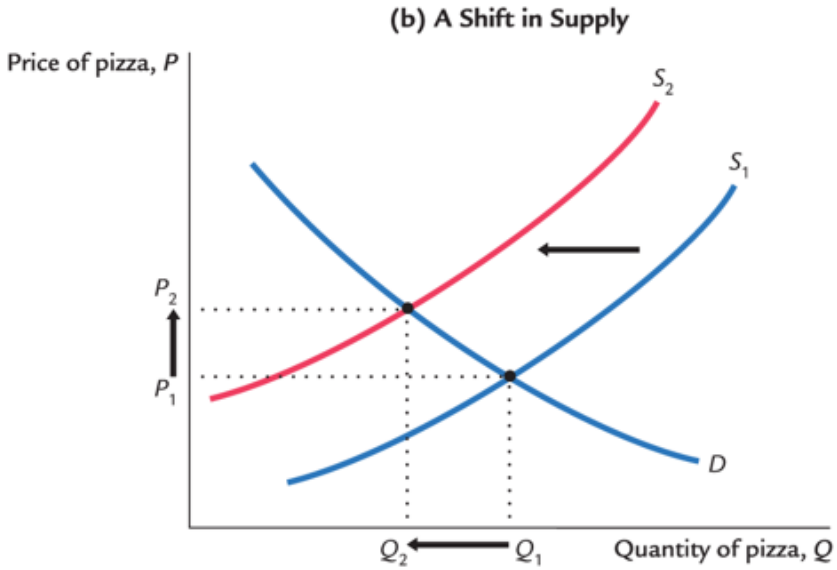
The effects of a steel price increase

Supply equation:

$$Q^s = S\,(P, P_S)$$

An increase in P_s reduces the quantity of cars producers supply at each price…

…which increases the market price and reduces the quantity.



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The use of multiple models

No one model can address all the issues we care about.

E.g., if we consider a supply-demand model of the car market…

can tell us how a fall in aggregate income affects price & quantity of cars.

cannot tell us *why* aggregate income falls.

The use of multiple models

So we will learn different models for studying different issues (*e.g.*, unemployment, inflation, long-run growth).

For each new model, you should keep track of

its assumptions

which variables are endogenous, which are exogenous

the questions the model can help us understand,

those it cannot

Endogenous vs. exogenous variables

The values of **endogenous** variables are determined in the model.

The values of **exogenous** variables are determined outside the model: the model takes their values and behavior as given.

Prices: flexible vs. sticky

Market clearing: An assumption that prices are flexible, adjust to equate supply and demand.

In the short run, many prices are **sticky** –
adjust sluggishly in response to changes in supply or demand.

For example:

many labor contracts fix the nominal wage for a year or longer

many magazine publishers change prices only once every 3 to 4 years

Prices: flexible vs. sticky

The economy's behavior depends partly on whether prices are sticky or flexible:

If prices sticky (short run),
demand may not equal supply, which explains:

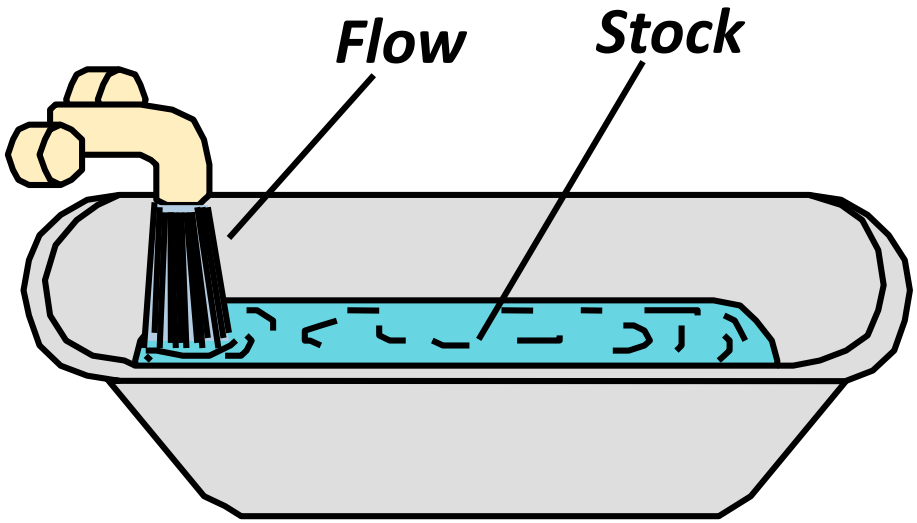
- unemployment (excess supply of labor)
- why firms cannot always sell all the goods they produce

If prices flexible (medium run), markets clear and economy behaves very differently

Stocks versus Flows variables

A **stock** is a quantity measured at a point in time.

E.g.,
"The U.S. capital stock was $10 trillion on January 1, 2014."



A **flow** is a quantity measured per unit of time.

E.g., "U.S. investment was $2 trillion during 2014."

Stocks vs. Flows - examples

stock	***flow***
a person's wealth	a person's annual saving
# of people with college degrees	# of new college graduates this year
the govt debt	the govt budget deficit

Stocks or Flows?

- the balance on your credit card statement
- how much time you spend studying
- the size of your Ipad
- the inflation rate
- the unemployment rate

Stocks or Flows?

- The balance on your credit card statement is a stock. (A corresponding flow would be the amount of new purchases on your credit card statement.)

- How much time you study is a flow. The statement "I study 10 hours" is only meaningful if we know the time period—whether 10 hours per day, per week, per month, etc.

- The size of your Ipad is a stock. (A corresponding flow would be how many CDs you buy per month or how many tracks you buy per month.)

- The inflation rate is a flow: we say "prices are increasing by 3.2% per year" or "by 0.4% per month."

- The unemployment rate is a stock: It's the number of unemployed people divided by the number of people in the workforce. In contrast, the number of newly unemployed people per month would be a flow.

Aggregate Output

National income and product accounts were developed at the end of World War II as measures of aggregate output.

The measure of **aggregate output** is called gross domestic product (**GDP**).

How would you define aggregate output in the economy?

Three basic definitions of GDP

(1) GDP = sum of final sales (demand) in country during a given *period of time.*

Because the value of the final goods already includes the value of the intermediate goods,

so including intermediate *and* final goods in GDP would be double counting.

Three basic definitions of GDP

(2) GDP = sum of value added during chain of economic activities

Value added:
The value of output minus
the value of the intermediate goods used to produce that output

IDENTIFYING VALUE ADDED

A farmer grows a bushel of wheat
and sells it to a miller for $1.00.
The miller turns the wheat into flour
and sells it to a baker for $3.00.
The baker uses the flour to make a loaf of
bread and sells it to an engineer for $6.00.
The engineer eats the bread.

Compute value added at each stage of production and GDP

Three basic definitions of GDP

(3) GDP = sum of incomes earned in *area* during *period*

Aggregate Output: an example

Steel Company (Firm 1)		
Revenues from sales		$100
Expenses		$80
Wages	$80	
Profit		$20

Car Company (Firm 2)		
Revenues from sales		$200
Expenses		$170
Wages	$70	
Steel purchases	$100	
Profit		$30

Consider an economy with two firms, Firm 1 and Firm 2.

Is aggregate output the sum of the values of all goods produced, i.e., $300? Or just the value of cars, i.e., $200?

Steel is an **intermediate good**, which is a good used in the production of another good.

Aggregate Output

1. **GDP is the value of final goods and services produced in the economy during a given period.**

   We want to count only **final goods**, not intermediate goods.

   If we merge the two firms in the previous example, the revenues of the new firm equal $200.

Steel and Car Company	
Revenues from sales	$200
Expenses (wages)	$150
Profit	$50

Aggregate Output

2. **GDP is the sum of value added in the economy during a given period.**

   The **value added** by a firm is the value of its production minus the value of the intermediate goods used in production.

   In the two-firm example, the value added equals $100 + $100 = $200.

So far, we have looked at GDP from the *production side*.

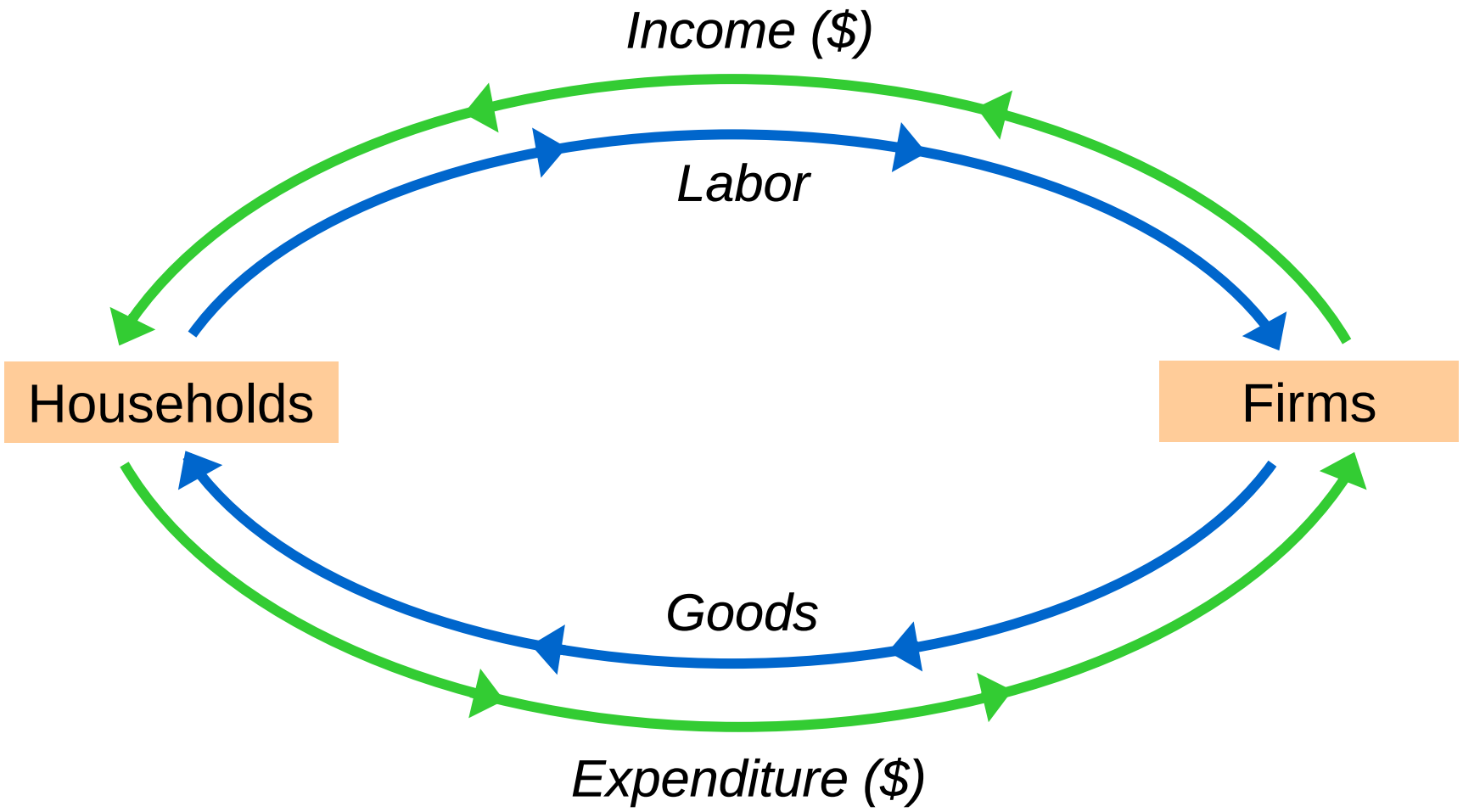
Aggregate Output

3. **GDP is the sum of incomes in the economy during a given period.**

   Aggregate production and aggregate income are always equal.

   From the *income side*, valued added in the two-firm example is equal to the sum of *labor income* ($150) and *capital* or *profit* income ($50), i.e., $200.

The Circular Flow



Aggregate Output: Nominal and Real GDP

Nominal GDP is the sum of the quantities of final goods produced times their current price.

Nominal GDP increases for two reasons:

- The production of most goods increases
- The price of most goods increases

Our goal is to measure production and its change over time.

Real GDP is the sum of quantities of final goods times *constant* (not *current*) prices.

Aggregate Output

Example:

Year	Quantity of Cars	Price of Cars	Nominal GDP	Real GDP (in 2009 dollars)
2008	10	$20,000	$200,000	$240,000
2009	12	$24,000	$288,000	$288,000
2010	13	$26,000	$338,000	$312,000

Real GDP in 2008 (in 2009 dollars) = 10 cars x $24,000 per car = $240,000.

Real GDP in 2009 (in 2009 dollars) = 12 cars x $24,000 per car = $288,000.

Real GDP in 2010 (in 2009 dollars) = 13 cars x $24,000 per car = $312,000.

Aggregate Output

For more than one good, relative prices of the goods are natural weights for constructed the weighted average of the output of all final goods.

Real GDP in chained (2009) dollars reflects relative prices that change over time.

The year used to construct prices is called the *base year*.

Real vs. nominal GDP

GDP is the *value* of all final goods and services produced.

Nominal GDP measures these values using current prices.

Real GDP measure these values using the prices of a base year.

Real and Nominal GDP

	2010		2011		2012	
	P	Q	P	Q	P	Q
good A	$30	900	$31	1,000	$36	1,050
good B	$100	192	$102	200	$100	205

- Compute nominal GDP in each year.
- Compute real GDP in each year using 2010 as the base year.

Answers

nominal GDP

2010: $46,200 = $30 × 900 + $100 × 192

2011: $51,400

2012: $58,300

real GDP

2010: $46,200

2011: $50,000

2012: $52,000 = $30 × 1050 + $100 × 205

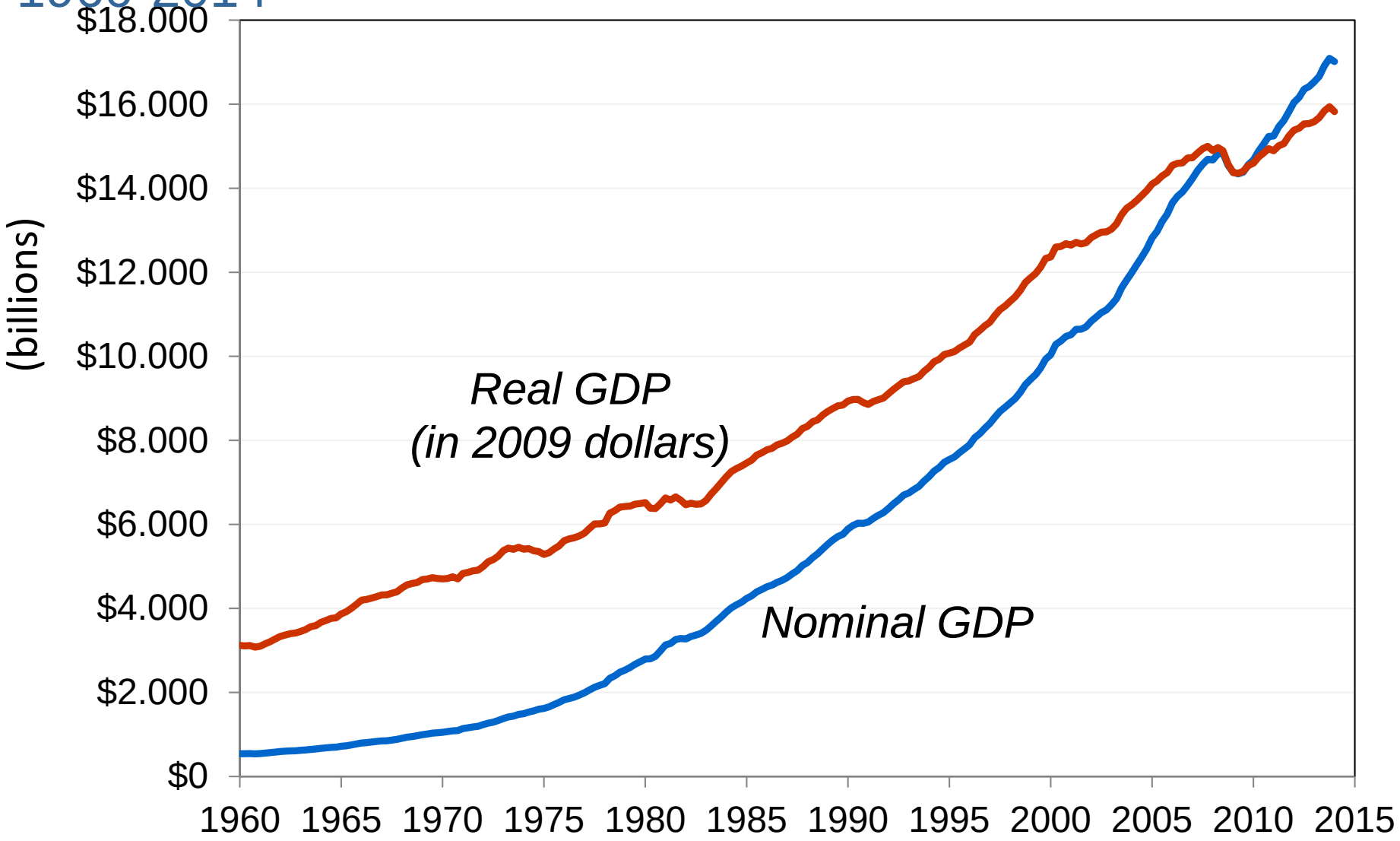
Real GDP controls for inflation

Changes in nominal GDP can be due to:

- changes in prices
- changes in quantities of output produced

Changes in real GDP can only be due to changes in quantities, because real GDP is constructed using constant base-year prices.

U.S. Nominal and Real GDP, 1960-2014



GDP Deflator

Inflation rate: the percentage increase in the overall level of prices

One measure of the price level: **GDP deflator**

Definition:

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

GDP Deflator

The GDP deflator is equivalent to a Paasche price index, because it uses current-period quantities as weights.

Paasche Index:

$$P_P = \frac{\sum(p_t \cdot q_t)}{\sum(p_0 \cdot q_t)} \times 100$$

Where:

- p_t = prices in the current period
- p_0 = prices in the base period
- q_t = quantities in the current period

GDP deflator and inflation rate

	Nom. GDP	Real GDP	GDP deflator	Inflation rate
2010	$46,200	$46,200		*n.a.*
2011	51,400	50,000		
2012	58,300	52,000		

- Use your previous answers to compute the GDP deflator in each year.
- Use GDP deflator to compute the inflation rate from 2010 to 2011, and from 2011 to 2012.

Answers

	Nom. GDP	Real GDP	GDP deflator	Inflation rate
2010	$46,200	$46,200	100.0	*n.a.*
2011	51,400	50,000	102.8	2.8%
2012	58,300	52,000	112.1	9.1%

Understanding the GDP deflator

Example with 3 goods

For good ***i*** = 1, 2, 3

P_{it} = the market price of good ***i*** in month ***t***

Q_{it} = the quantity of good ***i*** produced in month ***t***

$NGDP_t$ = Nominal GDP in month ***t***

$RGDP_t$ = Real GDP in month ***t***

Understanding the GDP deflator

$$\text{GDP deflator}_t = \frac{\text{NGDP}_t}{\text{RGDP}_t} = \frac{P_{1t}Q_{1t} + P_{2t}Q_{2t} + P_{3t}Q_{3t}}{\text{RGDP}_t}$$

$$= \left(\frac{Q_{1t}}{\text{RGDP}_t}\right)P_{1t} + \left(\frac{Q_{2t}}{\text{RGDP}_t}\right)P_{2t} + \left(\frac{Q_{3t}}{\text{RGDP}_t}\right)P_{3t}$$

The GDP deflator is a weighted average of prices.

The weight on each price reflects that good's relative importance in GDP.

Note that the weights change over time.

Chain-Weighted Real GDP

Over time, relative prices change, so the base year should be updated periodically.

In essence, **chain-weighted real GDP**
updates the base year every year,
so it is more accurate than constant-price GDP.

Your textbook usually uses
constant-price real GDP, because:

- the two measures are highly correlated.
- constant-price real GDP is easier to compute.

Consumer Price Index (CPI)

A measure of the overall level of prices
Published by the Bureau of Labor Statistics (BLS)
Uses:

- tracks changes in the typical household's cost of living
- adjusts many contracts for inflation ("COLAs")
- allows comparisons of dollar amounts over time

COLA=Cost Of Living Adjustment

CPI

1. Survey consumers to determine composition of the typical consumer's "basket" of goods
2. Every month, collect data on prices of all items in the basket; compute cost of basket
3. CPI in any month equals

$$100 \times \frac{\text{Cost of basket in that month}}{\text{Cost of basket in base period}}$$

CPI

The **Consumer Price Index (CPI)** is **constructed as a Laspeyres-type index**, because it uses a **fixed base-period basket** of consumer goods.

Laspeyres Index:

$$P_L = \frac{\sum(p_t \cdot q_0)}{\sum(p_0 \cdot q_0)} \times 100$$

Where:

- p_t = prices in the current period
- p_0 = prices in the base period
- q_0 = quantities in the base period

NOW YOU TRY
Compute the CPI

Basket: 20 pizzas, 10 compact discs

prices:

	pizza	CDs
2012	$10	$15
2013	11	15
2014	12	16
2015	13	15

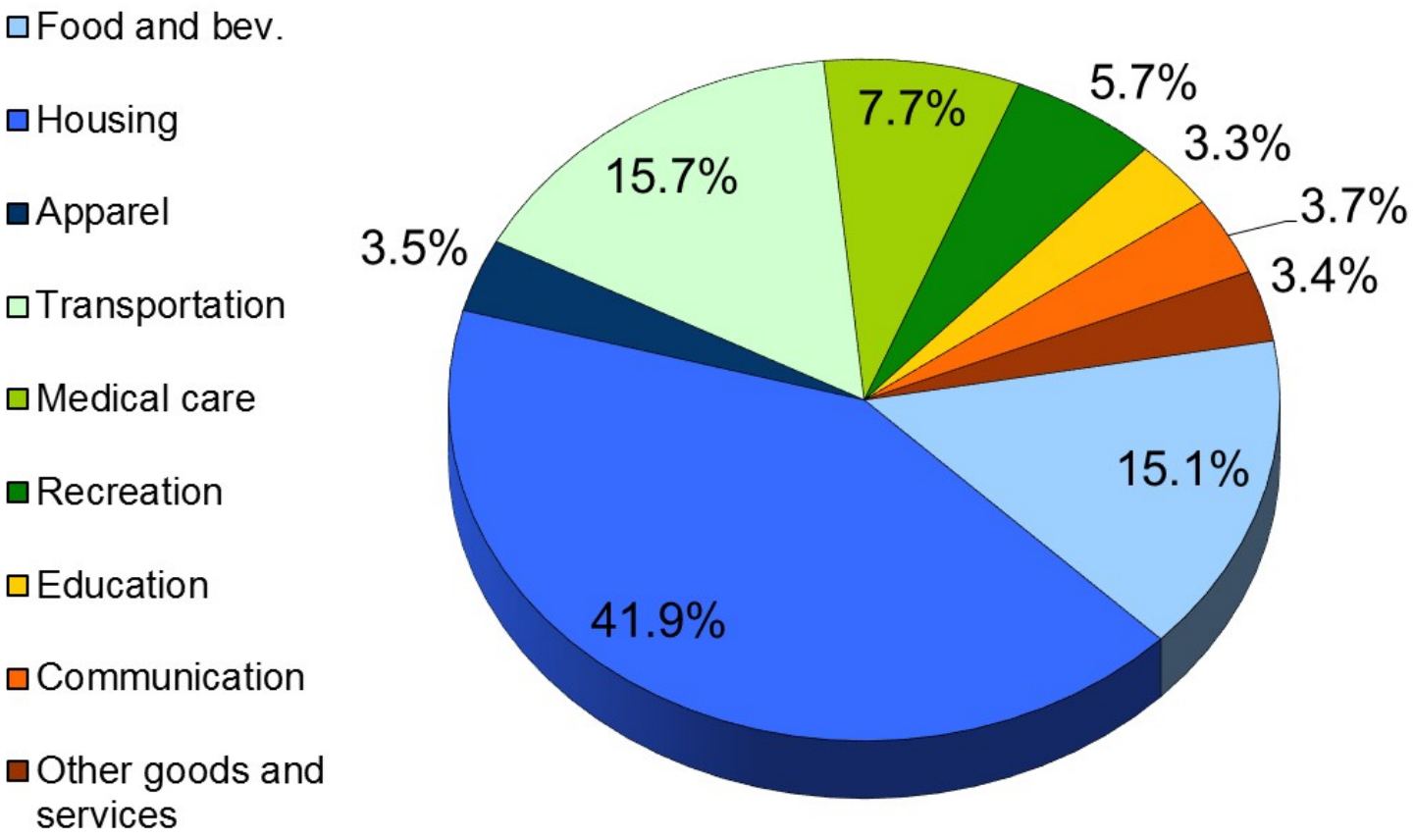
For each year, compute

- the cost of the basket
- the CPI (use 2012 as the base year)
- the inflation rate from the preceding year

NOW YOU TRY
Answers

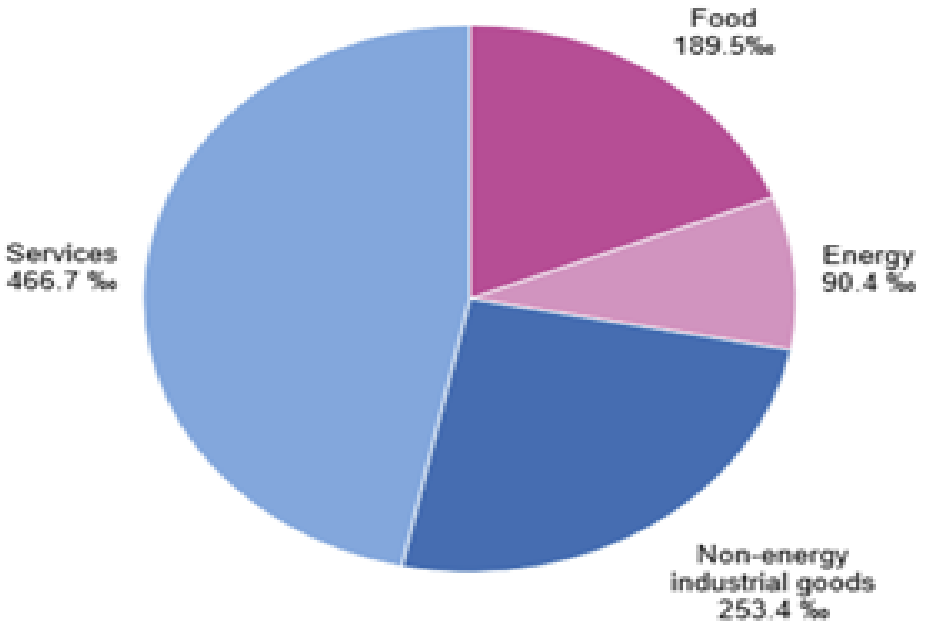
	Cost of basket	CPI	Inflation rate
2012	$350	100.0	*n.a.*
2013	370	105.7	5.7%
2014	400	114.3	8.1%
2015	410	117.1	2.5%

The composition of the CPI's "basket"



CPI in Europe 2026

Weights of the main components of the euro area HICP - 2026 (estimated)
(‰)



Source: Eurostat (online data code: prc_hicp_iw)

eurostat

Understanding the CPI

Example with 3 goods

For good ***i*** = 1, 2, 3

C_i = amount of good **i** in the CPI's basket

P_{it} = price of good ***i*** in month ***t***

E_t = cost of the CPI basket in month ***t***

E_b = cost of the basket in the base period

"*E*" to represent the cost of the basket because "*E*" stands for "Expenditure."

Understanding the CPI

$$\text{CPI in month } t = \frac{E_t}{E_b} = \frac{P_{1t}C_1 + P_{2t}C_2 + P_{3t}C_3}{E_b}$$

$$= \left(\frac{C_1}{E_b}\right) P_{1t} + \left(\frac{C_2}{E_b}\right) P_{2t} + \left(\frac{C_3}{E_b}\right) P_{3t}$$

The CPI is a weighted average of prices.

The weight on each price reflects that good's relative importance in the CPI's basket.

Note that the weights remain fixed over time.

Why the CPI may overstate inflation

Substitution bias:
The CPI uses fixed weights, so it cannot reflect consumers' ability to substitute toward goods whose relative prices have fallen.

Introduction of new goods:
The introduction of new goods makes consumers better off and, in effect, increases the real value of the dollar. But it does not reduce the CPI, because the CPI uses fixed weights.

Unmeasured changes in quality:
Quality improvements increase the value of the dollar but are often not fully measured.

CPI vs. GDP Deflator

Prices of capital goods:

included in GDP deflator (if produced domestically)

excluded from CPI

Prices of imported consumer goods:

included in CPI

excluded from GDP deflator

The basket of goods:

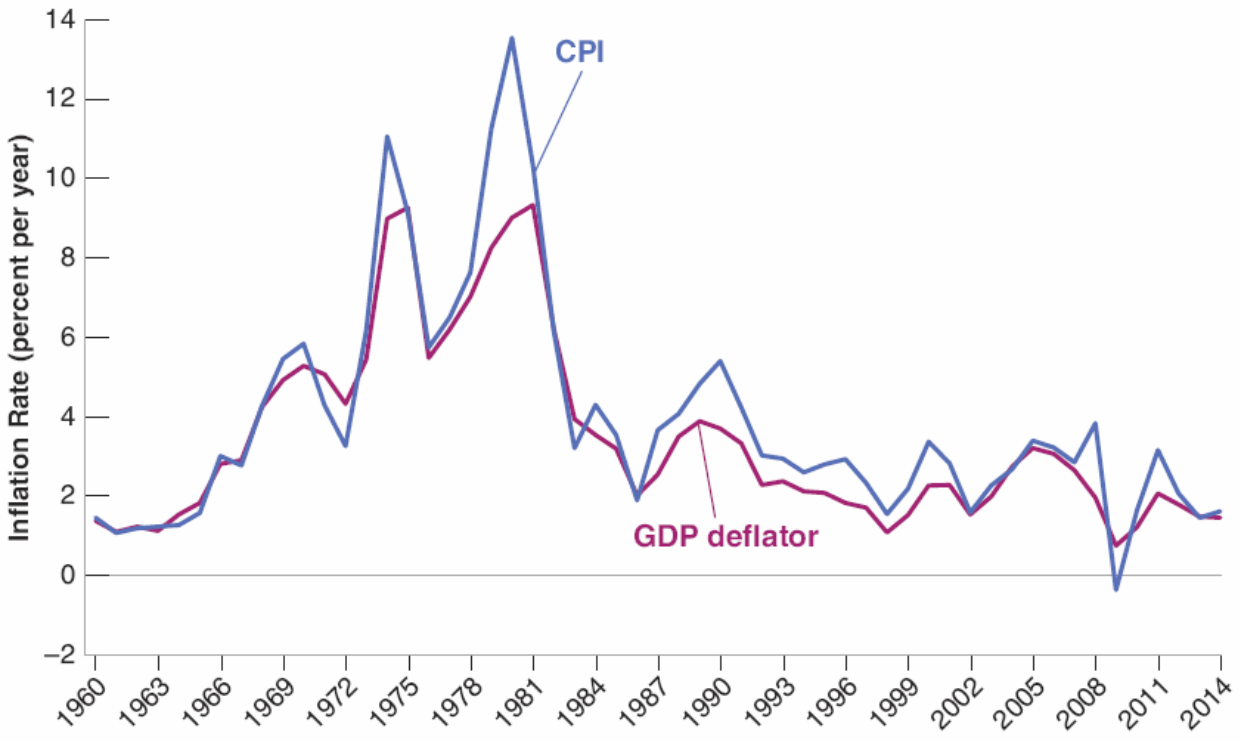
CPI: fixed

GDP deflator: changes every year

The Inflation Rate

US Inflation Rate, Using the CPI and the GDP Deflator, 1960–2014

The inflation rates, computed using either the CPI or the GDP deflator, are largely similar.



Source: Calculated using series USAGDPDEFAISMEI, CPALTT01USA659N Federal Reserve Economic Data (FRED) http://research.stlouisfed.org/fred2/.


IMF DataMapper
Inflation rate, average consumer prices (Annual percent change)
25
20
15
10
5
0
-5
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
2030
Italy
©IMF, 2025, Source: World Economic Outlook (October 2025)

FOCUS: Real GDP, Technological Progress, and the Price of Computers

The Department of Commerce deals with changes in the quality of existing goods like computers with an approach called **hedonic pricing**, which treats goods as providing a collection of characteristics.

The quality of new laptops (computing services) has increased on average by 18% a year since 1995.

The dollar price of a typical laptop has also declined by about 7% a year since 1995.

This implies that laptops' quality-adjusted price has fallen at an average rate of 18% + 7% = 25% per year.

The Inflation Rate

Inflation is a sustained rise in the general level of prices—the **price level**.

The **inflation rate** is the rate at which the price level increases.

Deflation is a sustained decline in the price level (negative inflation rate).

The Inflation Rate

The **GDP deflator** in year *t* (P_t) is the ratio of nominal GDP to real GDP in year *t*:

$$P_t = \frac{\text{Nominal GDP}_t}{\text{Real GDP}_t} = \frac{\$\,Y_t}{Y_t}$$

It is called an **index number** (1 in 2009), which has no economic interpretation.

The rate of change has a clear interpretation: the rate of inflation.

$$\pi_t = (P_t - P_{t\text{-}1})/P_{t\text{-}1}$$

The Inflation Rate

Defining the price level as the GDP deflator implies a simple relation between nominal GP, real GDP, and the GDP deflator:

$$\$Y_t = P_t Y_t$$

Nominal GDP is equal to the GDP deflator times real GDP.

The rate of growth of nominal GDP is equal to the rate of inflation plus the rate of growth of real GDP.

The Inflation Rate

The set of **goods produced** in the economy is not the same as the set of **goods purchased** by consumers because:

Some of the goods in GDP are sold not to consumers but to firms, to the government, or to foreigners.

Some of the goods bought by consumers are not produced domestically but are imported from abroad.

The **Consumer Price Index** (**CPI**) is a measure of the **cost of living**.

The CPI is published monthly by the Bureau of Labor Statistics (BLS), in the US.

Is published monthly by Eurostat (HCPI); it is published monthly by ISTAT.

The CPI gives the cost in dollars or Euro of a specific list of goods and services over time.

The Inflation Rate

The CPI and GDP deflator moved together most of the time.

Exception: In 1979 and 1980, the increase in the CPI was significantly larger than the increase in the GDP deflator due to the price of imported goods increasing relative to the price of domestically produced goods.

The Inflation Rate

Pure inflation is proportional increase in all prices and wages.

This type of inflation causes only a minor inconvenience as relative prices are unaffected.

Real wage (wage measured by goods rather than Euro) would be unaffected.

There is no such thing as pure inflation.

The Inflation Rate

Why Do Economists Care about Inflation?

Inflation affects income distribution when not all prices and wages rise proportionally.

Inflation leads to distortions due to uncertainty, some prices that are fixed by law or by regulation, and its interaction with taxation (*bracket creep* in taxes).

The **ECB** considers **2% inflation** optimal (target) because:

- It supports economic growth
- It helps maintain stable employment
- It avoids deflation

The Unemployment Rate

Employment is the number of people who have a job.

Unemployment is the number of people who do not have a job but are looking for one.

The **labor force** is the sum of employment and unemployment.

$$\begin{array}{ccccc} L & = & N & + & U \\ \text{labor force} & = & \text{employment} & + & \text{unemployment} \end{array}$$

Not in the labor force

not employed, not looking for work

The Unemployment Rate

The **unemployment rate** is the ratio of the number of people who are unemployed to the number of people in the labor force.

$$u = \frac{U}{L}$$

$$\text{unemployment rate} = \text{unemployment / labor force}$$

The Unemployment Rate

Most rich countries rely on large surveys of households to compute the unemployment rate.

The U.S. **Current Population Survey (CPS)** relies on interviews of 60,000 households every month.

A person is unemployed if he or she does not have a job *and has been looking for a job in the last four weeks*.

Those who do not have a job and are not looking for one are counted as **not in the labor force**.

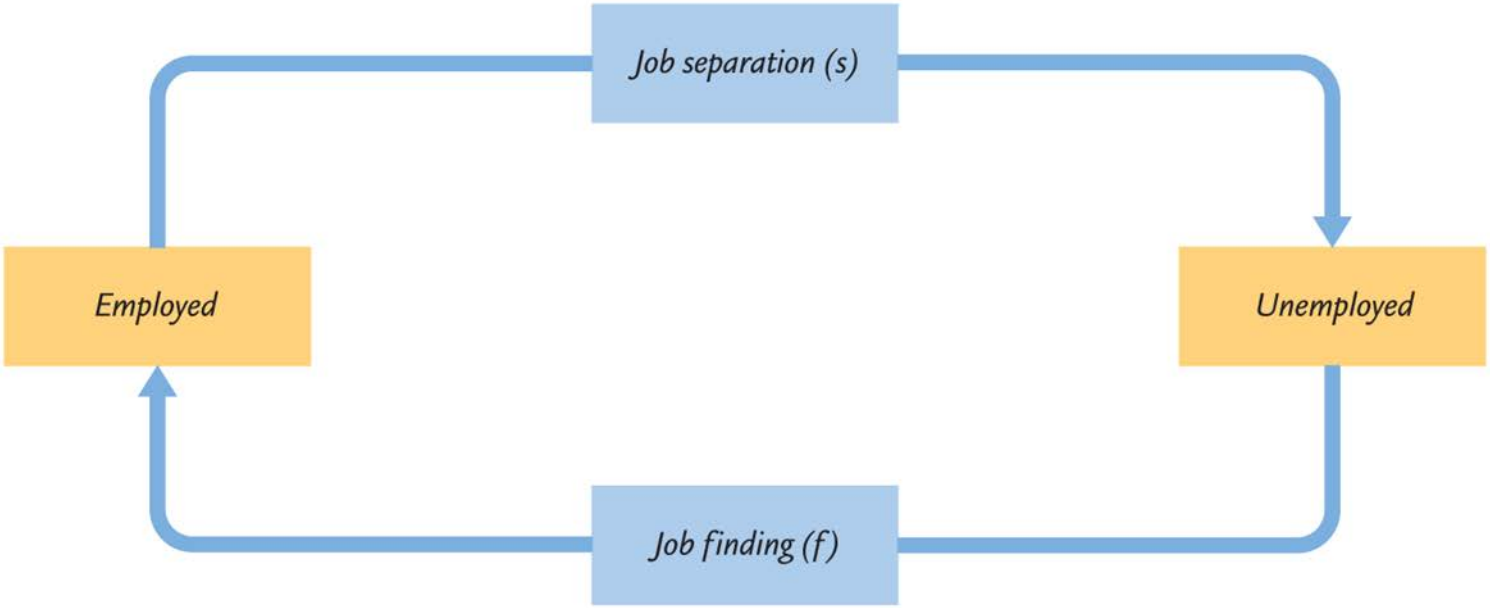
The Unemployment Rate

Discourage workers are those who give up looking for a job and so no longer counted as unemployed.

The **participation rate** is the ratio of the labor force to the total population of working age.

Because of discourage workers, a higher unemployment rate is typically associated with a lower participation rate.

The transitions between employment and unemployment



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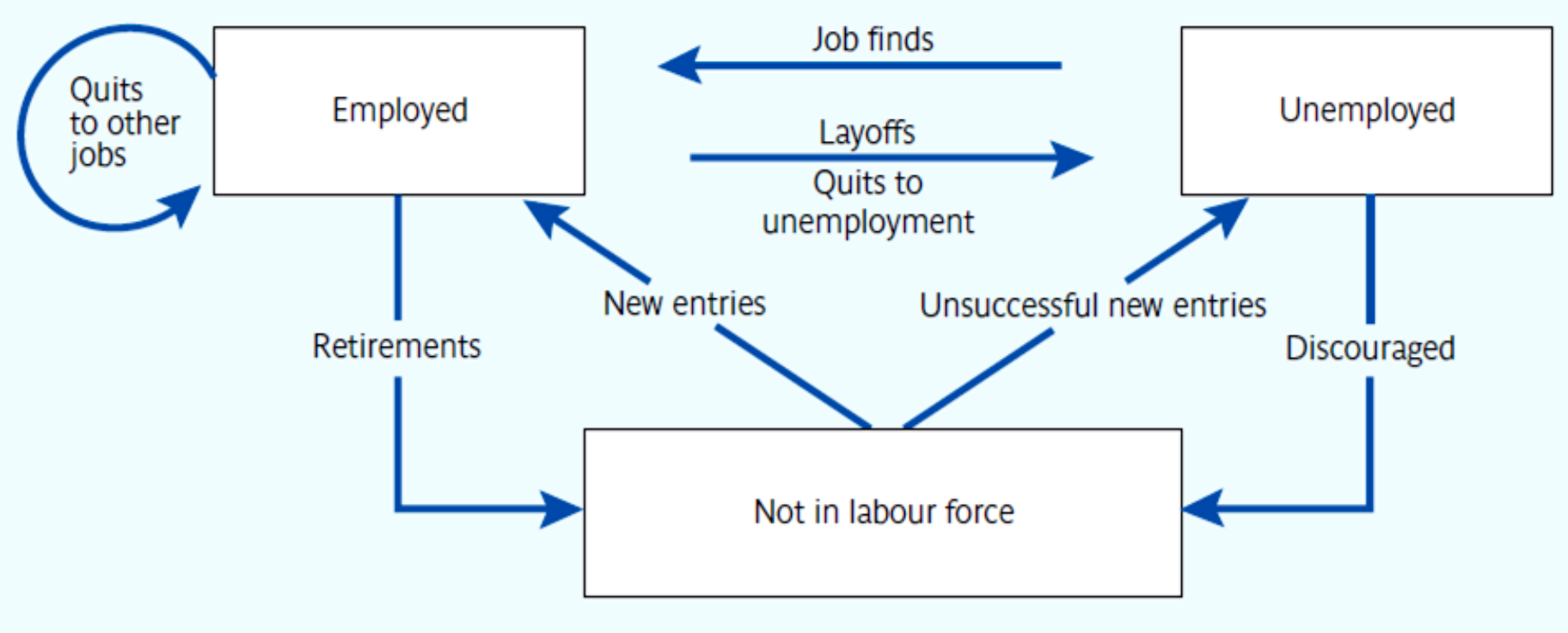
Labour Markets flows



NOW YOU TRY
Computing labor statistics

U.S. adult population by group, June 2017

Number employed = 153.2 million

Number unemployed = 7.0 million

Adult population = 255.0 million

Calculate

- the labor force
- the unemployment rate
- the labor force participation rate

NOW YOU TRY

Computing labor statistics

Data: ***N*** = 153.2, ***U*** = 7.0, ***POP*** = 255.0

Labor force

L = **N** + ***U*** = 153.2 + 7.0 = 160.2

Unemployment rate

U/L × 100% = (7.0/160.2) × 100% = 4.4%

Labor force participation rate

L/POP × 100% = (160.2/255.0) × 100% = 62.8%

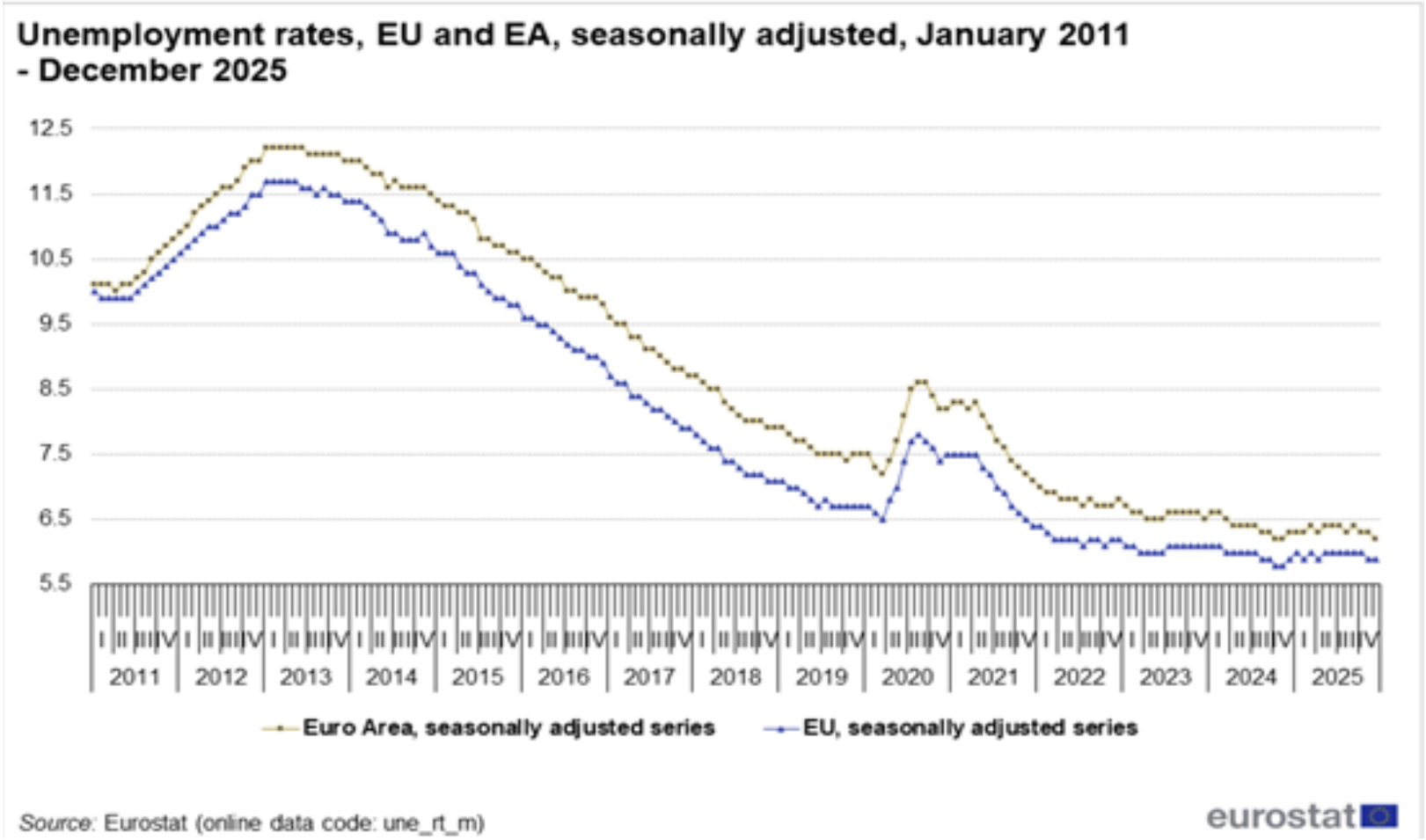
The Unemployment Rate

Why Do Economists Care about Unemployment?

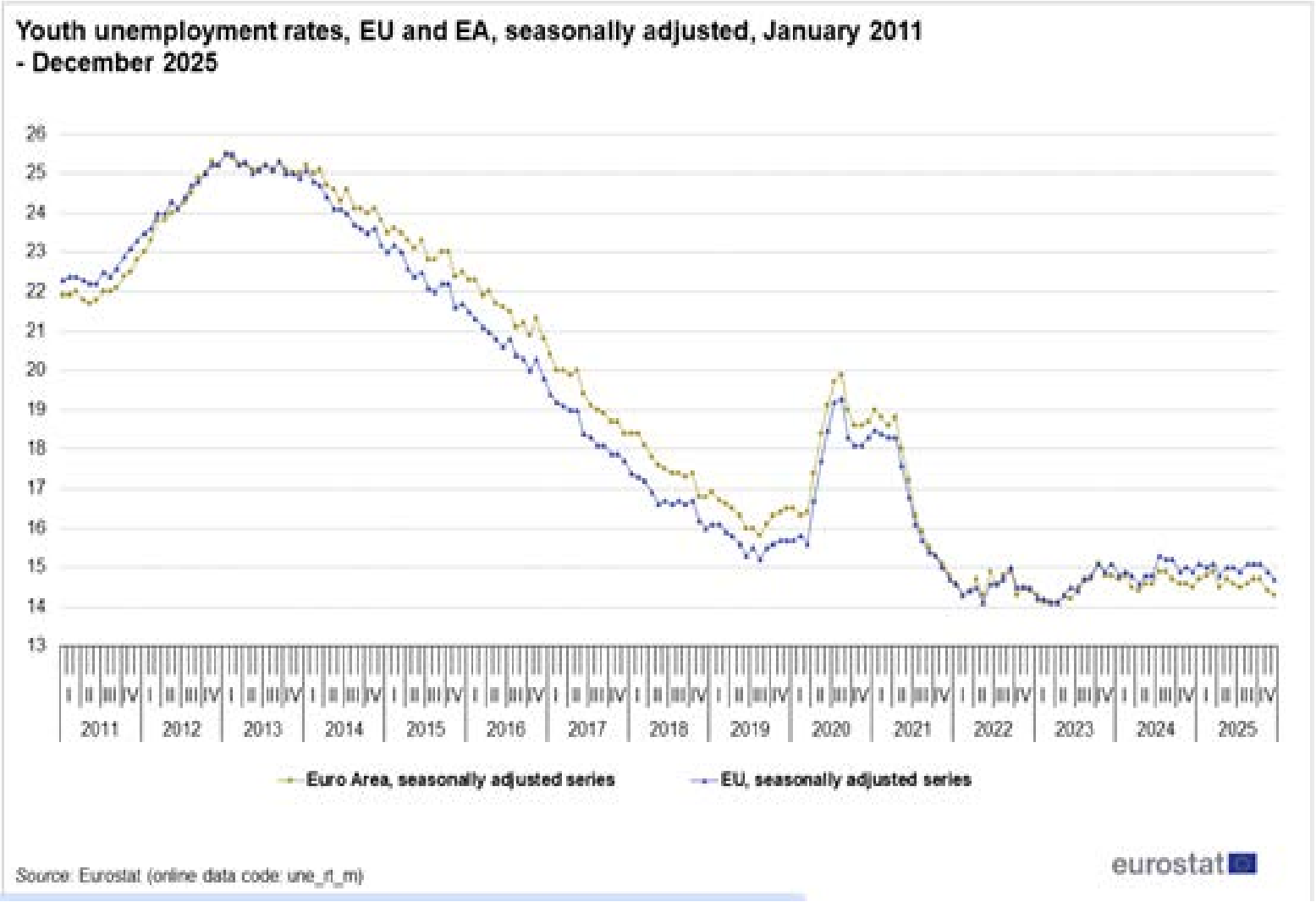
1. Direct effect on the welfare of the unemployed, especially those remaining unemployed for long periods of time.
2. A signal that the economy is not using its human resources efficiently.

Very low unemployment can also be a problem as the economy runs into labor shortages.

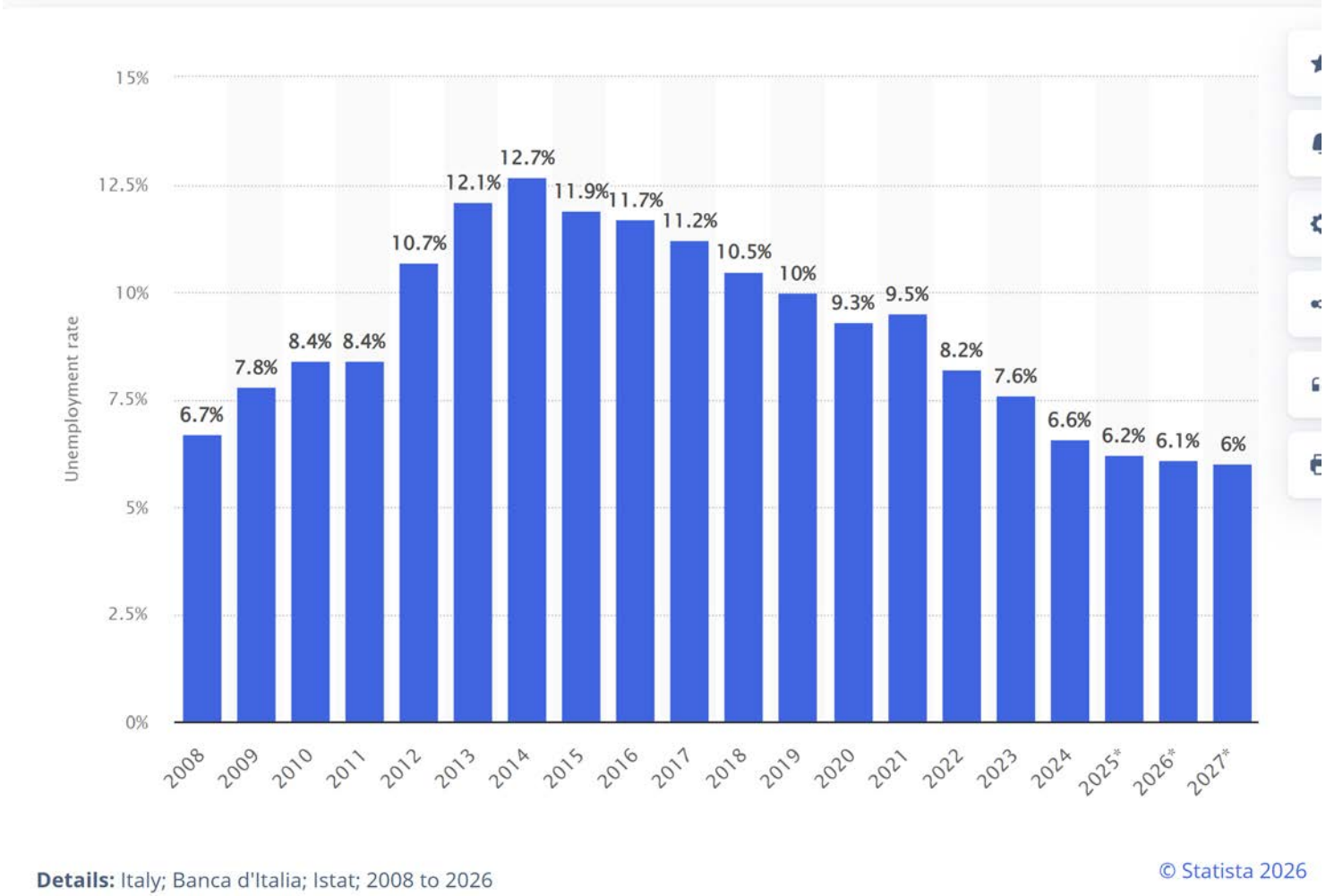
The Unemployment Rate EU 2011-2025



Youth Unemployment Rate - EU 2011-2025



Unemployment Rate – Italy 2008-2026

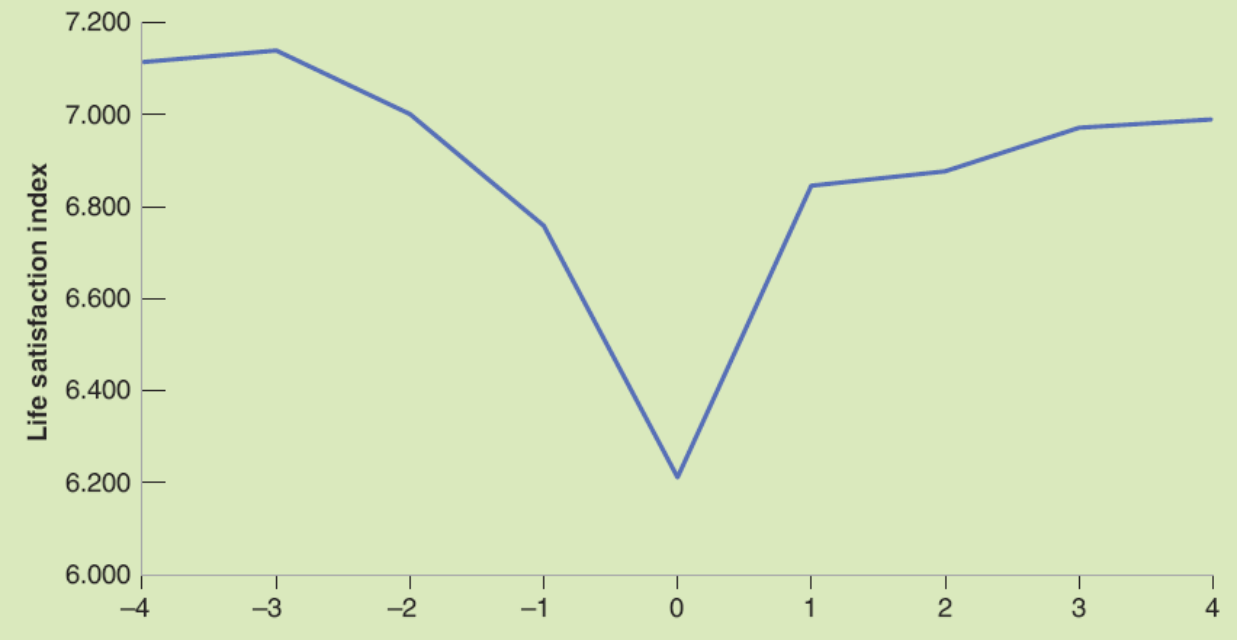


Details: Italy; Banca d'Italia; Istat; 2008 to 2026

FOCUS: Unemployment and Happiness

Results of the German Socio-Economic Panel survey suggest that (1) becoming unemployed leads to a large decrease in happiness, (2) happiness declines before the actual unemployment spell, and (3) happiness does not fully recover even four years later.

Figure 1 Effects of Unemployment on Happiness



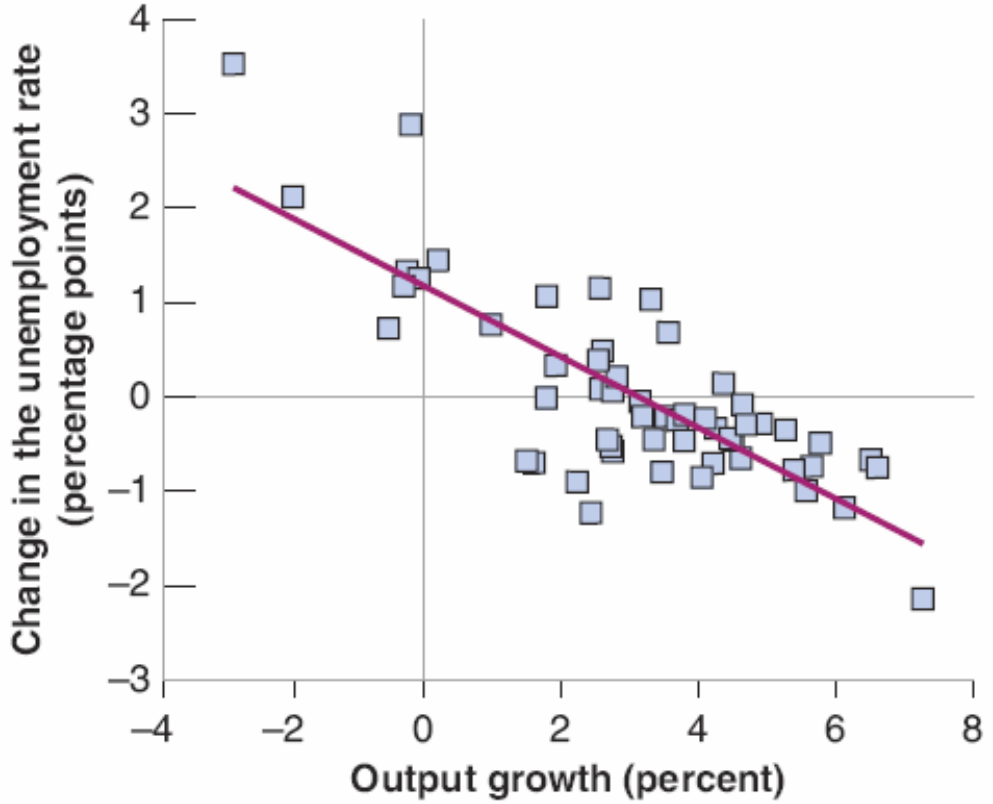
Source: Winkelmann 2014.

Output, Unemployment, and the Inflation Rate: Okun's Law and the Phillips Curve

Figure 2-5 Changes in the Unemployment Rate versus Growth in the United States, 1960–2014

Output growth that is higher than usual is associated with a reduction in the unemployment rate.

Output growth that is lower than usual is associated with an increase in the unemployment rate.



Source: See Figures 2-2 and 2-3.

Output, Unemployment, and the Inflation Rate: Okun's Law and the Phillips Curve

Okun's law is a relation first examined by U.S. economist Arthur Okun.

In Figure 2-5, the line that best fits the points is downward sloping.

The slope of the line is –0.4, which imples that, on average, an increase in the growth rate of 1% decreases the unemployment rate by –0.4%.

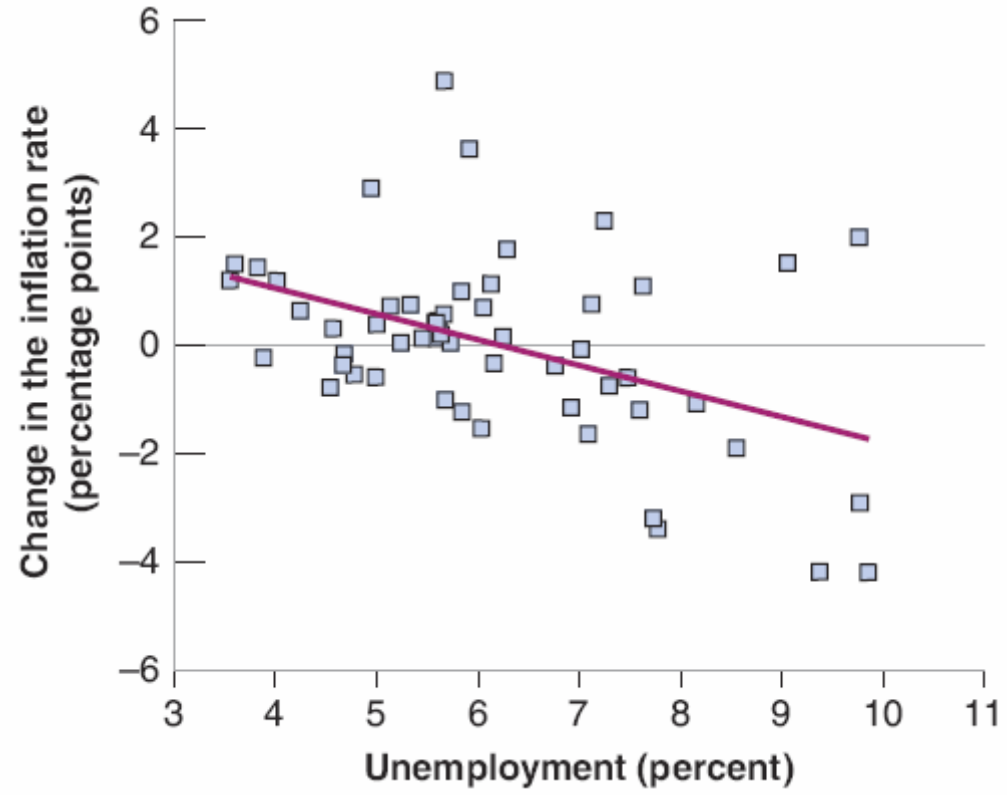
The line crosses the horizontal axis where output growth is 3%, meaning that it takes a growth rate of 3% to keep unemployment constant.

Output, Unemployment, and the Inflation Rate: Okun's Law and the Phillips Curve

Figure 2-6 Changes in the Inflation Rate versus the Unemployment Rate in the United States, 1960–2014

A low unemployment rate leads to an increase in the inflation rate.

A high unemployment rate leads to a decrease in the inflation rate.



Source: See Figures 2-3 and 2-4.

Output, Unemployment, and the Inflation Rate: Okun's Law and the Phillips Curve

The Phillips curve is a relation first explored in 1958 by New Zealand economist A.W. Phillips.

Figure 2-6 plots the change in the inflation rate against the unemployment rate, along with the line that best fits the points.

The line is downward sloping, meaning that higher unemployment leads, on average, to a decrease in inflation, and vice versa.

The line crosses the horizontal axis where the unemployment rate is equal to about 6%, meaning that inflation typically increased when unemployment was below 6%.

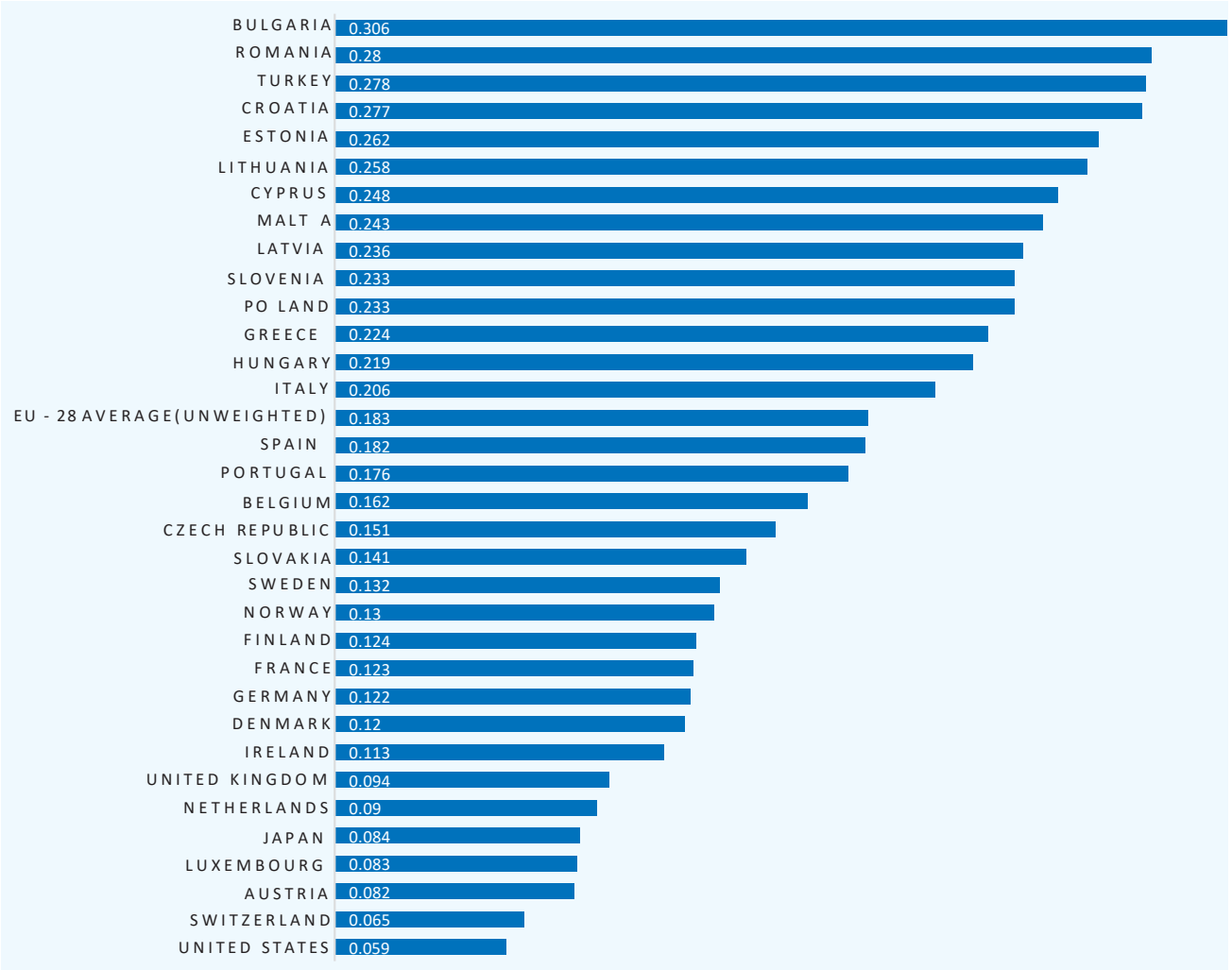
The Short Run, the Medium Run, and the Long Run

In the **short run** (e.g., a few years), year-to-year movements in output are primarily driven by movements in demand.

In the **medium run** (e.g., a decade), the economy tends to return to the level of output determined by supply factors, such as the capital stock, the level of technology, and the size of the labor force.

In the **long run** (e.g., a few decades or more), the economy depends on its ability to innovate and introduce new technologies, and how much people save, the quality of the county's education system, the quality of the government, and so on.

Size of the Underground Economy: Estimates
(% of GDP)



The expenditure components of GDP

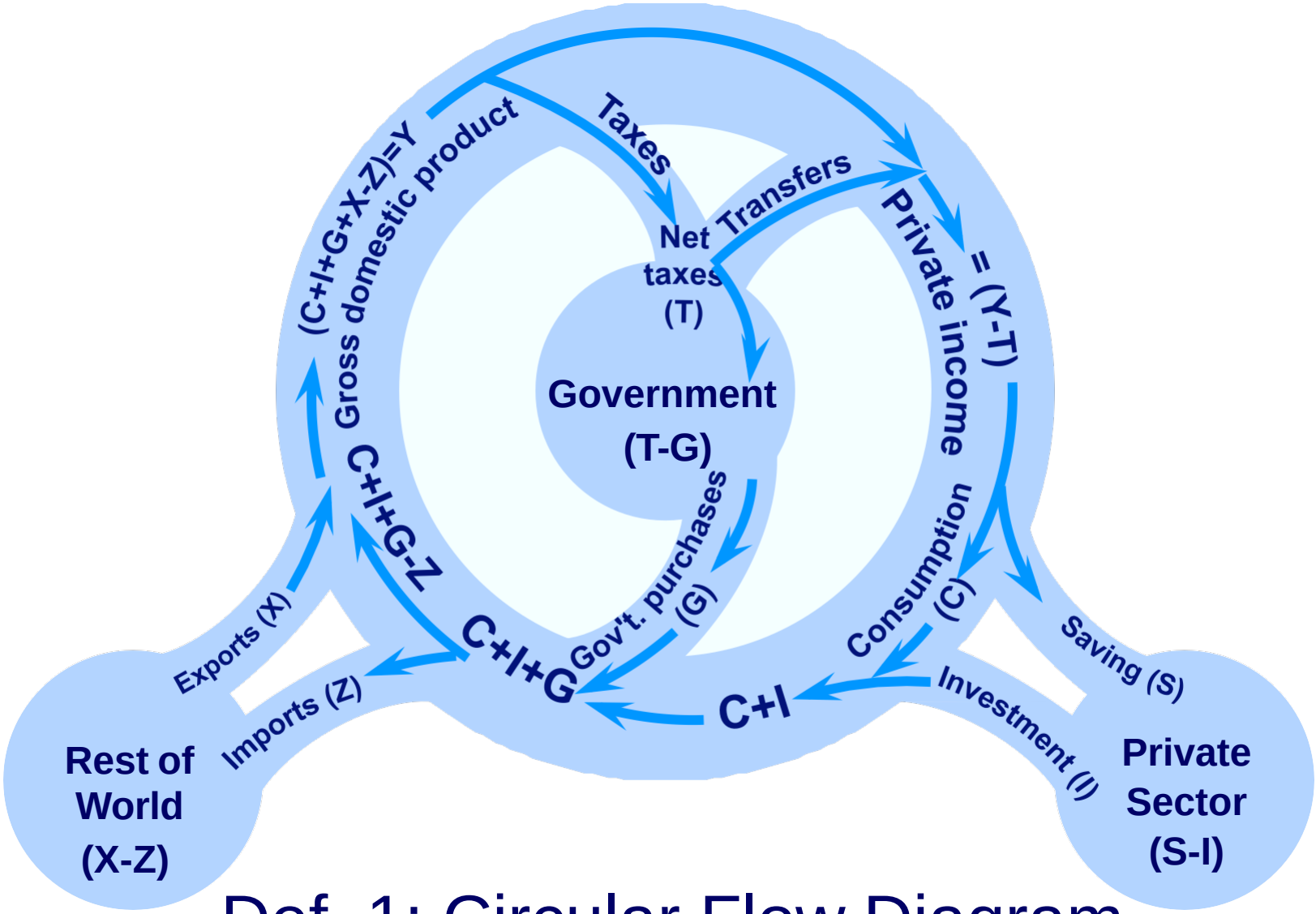
- consumption, ***C***
- investment, ***I***
- government spending, ***G***
- net exports, ***NX***

An important identity:

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

value of total output

aggregate expenditure



Def. 1: Circular Flow Diagram

Components of GDP by Expenditure
(1999-2015, % of GDP)

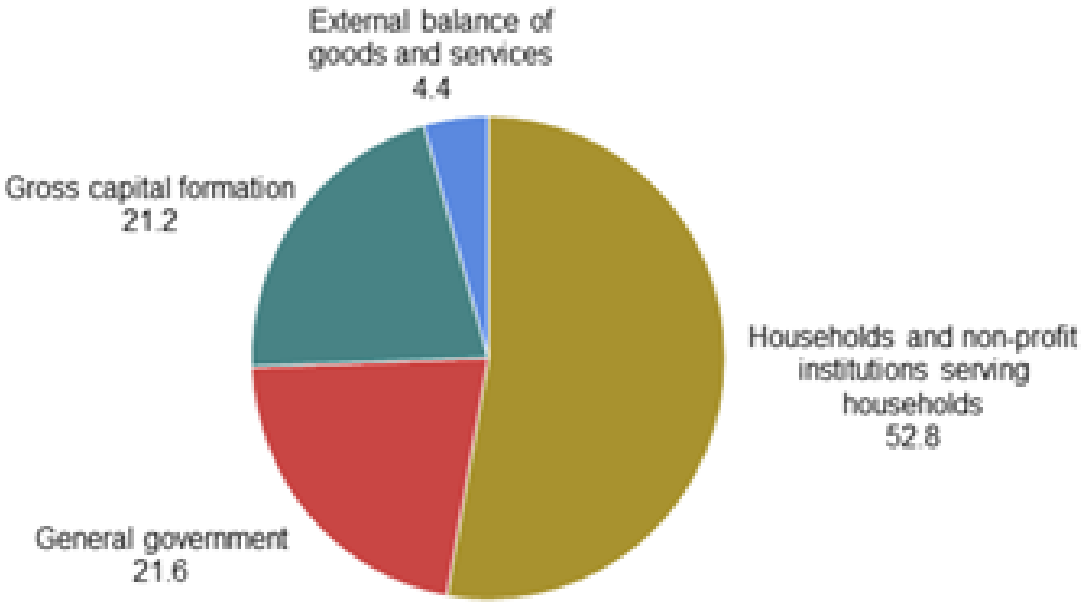
	Consumption (C)	Investment (I)	Government Purchases (G)
Australia	56.5	26.9	17.6
Canada	55.4	22.2	20.4
France	55.2	21.8	23.1
Germany	56.3	20.3	18.7
Italy	60.3	19.8	19.2
Japan	58.6	22.4	18.9
Switzerland	56.0	24.1	11.0
United Kingdom	64.5	17.6	19.9
United States	67.6	20.8	15.3
Euro area	56.1	21.5	20.3

Source: IMF

Component of GDP by Expenditure, % of GDP, Average 2020-2024 (source: IMF)

Country	Household Consumption (C)	Government Consumption (G)	Investment (I)	Net Exports (NX)	Total
Italy	55	20	18	7	100
France	56	22	18	4	100
Germany	53	19	21	7	100
United Kingdom	62	21	17	0	100
United States	68	18	18	-4	100
Japan	55	20	25	0	100
Euro Area	54	21	22	3	100

Expenditure components of GDP at current market prices, EU, 2024
(% share of GDP)

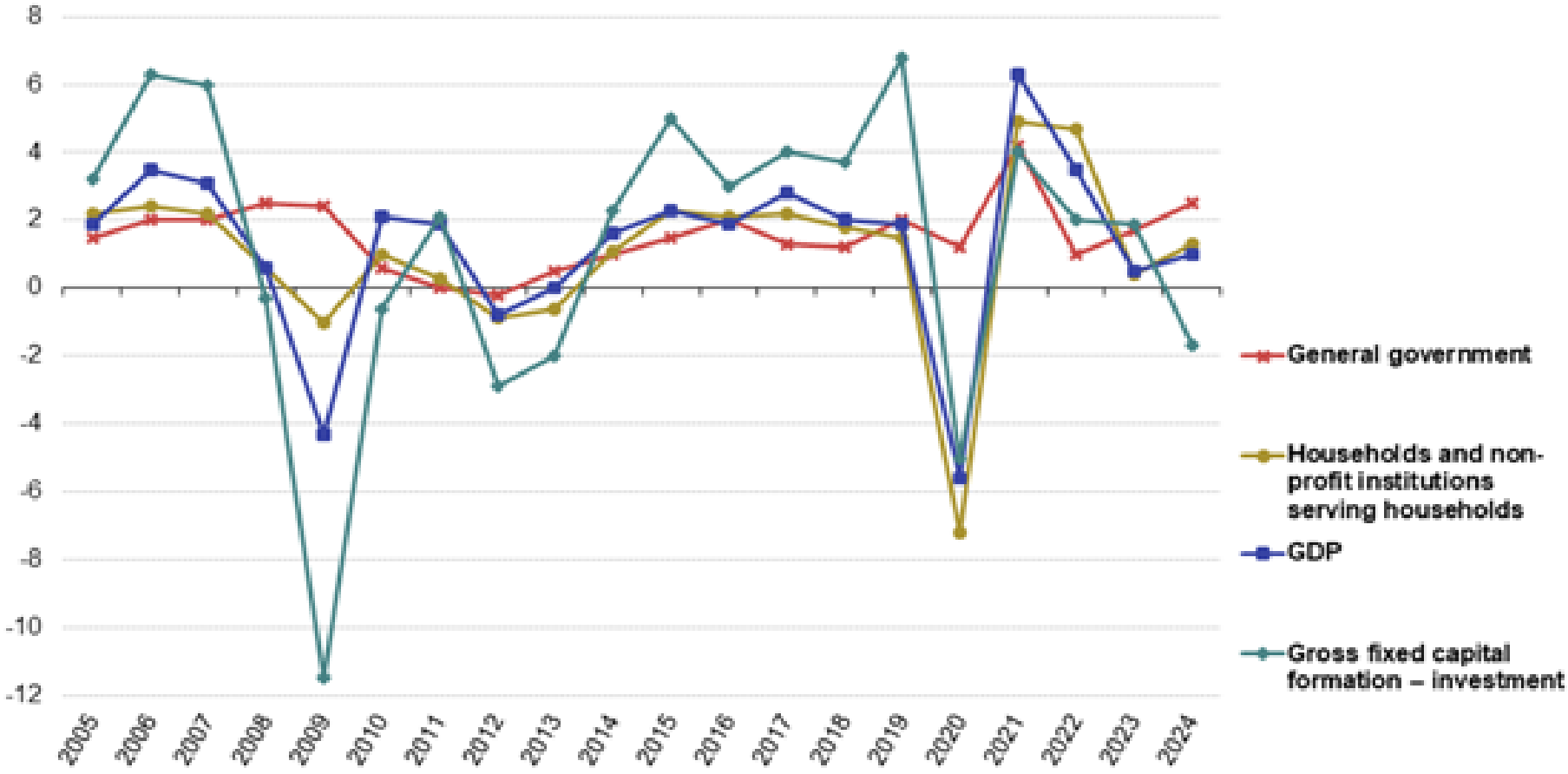


Source: Eurostat (online data code: nama_10_gdp)

eurostat

Real annual rate of change in expenditure components of GDP, EU, 2005–24

(%)



Note: based on chain linked volumes.

Source: Eurostat (online data code: nama_10_gdp)

eurostat

Consumption (*C*)

Definition: The value of all goods and services bought by households, including:

- ***Durable goods***

  last a long time.

  Examples: cars, home appliances

- ***Nondurable goods***

  last a short time.

  Examples: food, clothing

- ***Services***

  are intangible items purchased by consumers.

  Examples: dry cleaning,

  air travel

U.S. consumption, 2016

	Total (billions of dollars)	Per Person (dollars)
Gross Domestic product	18,624	57,638
Consumption	12,821	39,677
Nondurable goods	2,710	8,388
Durable goods	1,411	4,367
Services	8,699	26,922

Investment (*I*)

- Spending on capital, a physical asset used in future production
- Includes:
  - **Business fixed investment**—Spending on plant and equipment
  - **Residential fixed investment**—Spending by consumers and landlords on housing units
  - **Inventory investment**—The change in the value of all firms' inventories

U.S. investment, 2016

	Total (billions of dollars)	Per Person (dollars)
Gross Domestic product	18,624	57,638
Consumption	3,057	9,461
Nonresidential fixed investment	2,316	7,168
Residential fixed investment	706	2,185
Inventory investment	35	109

Government Spending (*G*)

- ***G*** includes all government spending on goods and services.
- ***G*** excludes transfer payments (e.g., unemployment insurance payments) because they do not represent spending on goods and services.

U.S. government spending, 2016

	Total (billions of dollars)	Per Person (dollars)
Gross Domestic product	18,624	57,638
Consumption	3,268	10,113
Federal	1,231	3,811
Defense	729	2,256
Nondefense	503	1,555

Net Exports (*NX*)

- ***NX*** = exports – imports
  - **Exports**: the value of g&s (goods and services) sold to other countries
  - **Imports**: the value of g&s purchased from other countries
- Hence, *NX* equals net spending from abroad on our g&s.

U.S. net exports, 2016

	Total (billions of dollars)	Per Person (dollars)
Gross Domestic product	18,624	57,638
Net Exports	−521	−1,613
Exports	2,215	6,854
Imports	2,736	8,647

The Balance of Payments

I. Current Account

a. Goods and Services
   1. Goods
   2. Services

b. International Primary Income
   1. Wages and Compensation
   2. Investment Income

c. Secondary Income

(unilateral transfers: Workers' remittances, International aid, Contributions to international organizations, etc)

II. Capital and Financial Accounts

a. Capital Account

b. Financial Account
   1. Direct Investment
   2. Portfolio Investment
   3. Other Investment
   4. Reserve Assets

c. Errors and Omissions

Table 2.8 Balance of Payments, Various Countries, 2014 (US$ billion)

	Eurozone	US	Sweden	Turkey	Brazil	China	Russia	UK
Current account	320	–390	33	–47	–104	220	58	–152
Balance on goods	332	–741	18	–64	–7	435	190	–203
Balance on services	94	233	9	25	–48	–151	–55	146
Primary income balance	79	238	15	–9	–52	–34	–68	–54
Secondary income balance	–186	–119	–10	1	3	–30	–8	–41
Capital account	27	0	–1	0	0	0	–42	–2
Net lending	346	–390	32	–47	–104	220	16	–154
Financial account balance	403	–240	13	–45	–100	79	23	–166
Direct investment, net	62	489	4	–7	–71	–209	34	–134
Portfolio investment, net	97	–167	21	–20	–39	–82	40	–189
Other investment, net	183	–240	–7	–17	–3	253	51	170
Reserve assets	6	–4	0	0	11	117	–108	12
Net errors and omissions	56	150	–17	2	3	–140	6	–12

Source: IMF

Balance of Payments: Some Examples

Transaction	Credit (+) or debit (-)	Country	Account
UK exports chemicals to France to the amount of £1 million	+ £1 m	UK	Goods and services
	- £1 m	France	Goods and services
French school trains German cyclists for €500,000	+ €500,000	France	Goods and services
	- €500,000	Germany	Goods and services
German construction company is paid SF5 million to build a Swiss bridge	+ SF5 m	Germany	Goods and services
	- SF5 m	Switzerland	Goods and services
Swiss ski instructor is paid salary of €80,000 for work performed in Austria	+ €80,000	Switzerland	International income
	- €80,000	Austria	International income

Balance of Payments: Some Examples

Transaction	Credit (+) or debit (-)	Country	Account
UK fast food franchises remit £1 million in profits to headquarters in the USA	+ £1 m	USA	International income
	- £1 m	UK	International income
Austrian government gives €3 million in relief aid to tsunami victims in Thailand	+ €3 m	Thailand	Current transfers
	- €3 m	Austria	Current transfers
Estonian worker in Denmark sends DK100,000 to family in Tallinn	+ DK100,000	Estonia	Current transfers
	- DK100,000	Denmark	Current transfers
Spanish government forgives debt of €10 m owed by Peru	+ €0 m	Peru	Capital account
	- €0 m	Spain	Capital account

Balance of Payments: Some Examples

Transaction	Credit (+) or debit (-)	Country	Account
Swedish investor purchases a factory in Germany for €100 million	+ €100 m	Germany	Financial account / direct investment
	- €100 m	Sweden	Financial account / direct investment
Portuguese bank buys €20 million of stock in German company from French bank based in France	+ €20 m	France	Financial account / portfolio investment
	- €20 m	Portugal	Financial account / portfolio investment
UK bank based in London lends £50 million to subsidiary in Ireland	+ £50 m	Ireland	Other investment
	- £50 m	UK	Other investment

Balance of Payments: Some Examples

Transaction	Credit (+) or debit (-)	Country	Account
Slovenian resident transfers €100,000 from home account to a bank account in Italy	+ €100,000	Italy	Financial account / portfolio investment
	- €100,000	Slovenia	Financial account / portfolio investment
Bank of England purchases €5 billion from the European Central Bank (ECB) paying with pound sterling	- €5 b	UK	Reserve assets account
	+ €5 b	Eurozone	Reserve assets account

Balance of Payments (BoP) and the GDP

(1) balance of goods and services = X − IM

(2) X − IM = NX = CA = Y - (C + I + G) = Y - A

X= export

IM=import

NX net export= X-IM=CA

Where CA stands for Current Account

A is absorption = C + I+ G

Balance of Payments and the GDP

CA > 0: net lender, CA < 0: net borrower

CA + FA + OFF=0

Overall BoP = CA + FA = - OFF

(OFF= Official Financial Flows)

Sources:

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- EUROSTAT
- IMF, International financial statistics