

MACROECONOMICS I

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Lecture 1

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MACROECONOMICS I

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Text-book: Mankiw, Principles of Economics/Macroeconomics (latest edition available)

Lectures/Seminars: Friday 09:00 – 10:50 / 11:00 – 12:50

GRADING

- Midterm exam (**40%**)
- Project presentation (**20%**)
- Final exam (**40%**)

Microeconomics

Study of how households and firms

- Make decisions
- Interact in markets

Macroeconomics

Study of economy-wide phenomena

- Including inflation, unemployment, and economic growth

PRINCIPLES OF ECONOMICS

PRINCIPLES OF ECONOMICS

Principles of decision making

- People face tradeoffs
- The cost of any action is measured in terms of foregone opportunities
- People respond to incentives
- Rational people think at the margin

PRINCIPLES OF ECONOMICS

Principles of interactions among people

- Trade can make everyone better off
- Markets are usually a good way to organize economic activity
- Government can potentially improve market outcomes if there is a market failure or if the market outcome is inequitable

PRINCIPLES OF ECONOMICS

Principles of the economy as a whole

- Productivity is the ultimate source of living standards
- Money growth is the ultimate source of inflation
- Society faces a short-run tradeoff between inflation and unemployment

QUESTION

- How would you measure/assess my economic health?
- What information do you need to understand whether I am in good or bad economic situation?

LOOK FOR THE ANSWERS TO QUESTIONS

- What is Gross Domestic Product (GDP)?
- How is GDP related to a nation's total income and spending?
- What are the components of GDP?
- How is GDP corrected for inflation?
- Does GDP measure society's well-being?

INCOME AND EXPENDITURE

Gross Domestic Product (GDP)

- Measures total income of everyone in the economy
- Also measures total expenditure on the economy's output of goods and services

Income equals expenditure

- For the economy as a whole
- Because every dollar a buyer spends is a dollar of income for the seller

THE CIRCULAR-FLOW DIAGRAM

The Circular-Flow Diagram

- Simple depiction of the macroeconomy
- Illustrates GDP as spending, revenue, factor payments, and income

Preliminaries

- Factors of production are inputs like labor, land, capital, and natural resources.
- Factor payments are payments to the factors of production (e.g., wages, rent).

Households:

- own the factors of production, sell/rent them to firms for income
- buy and consume goods & services

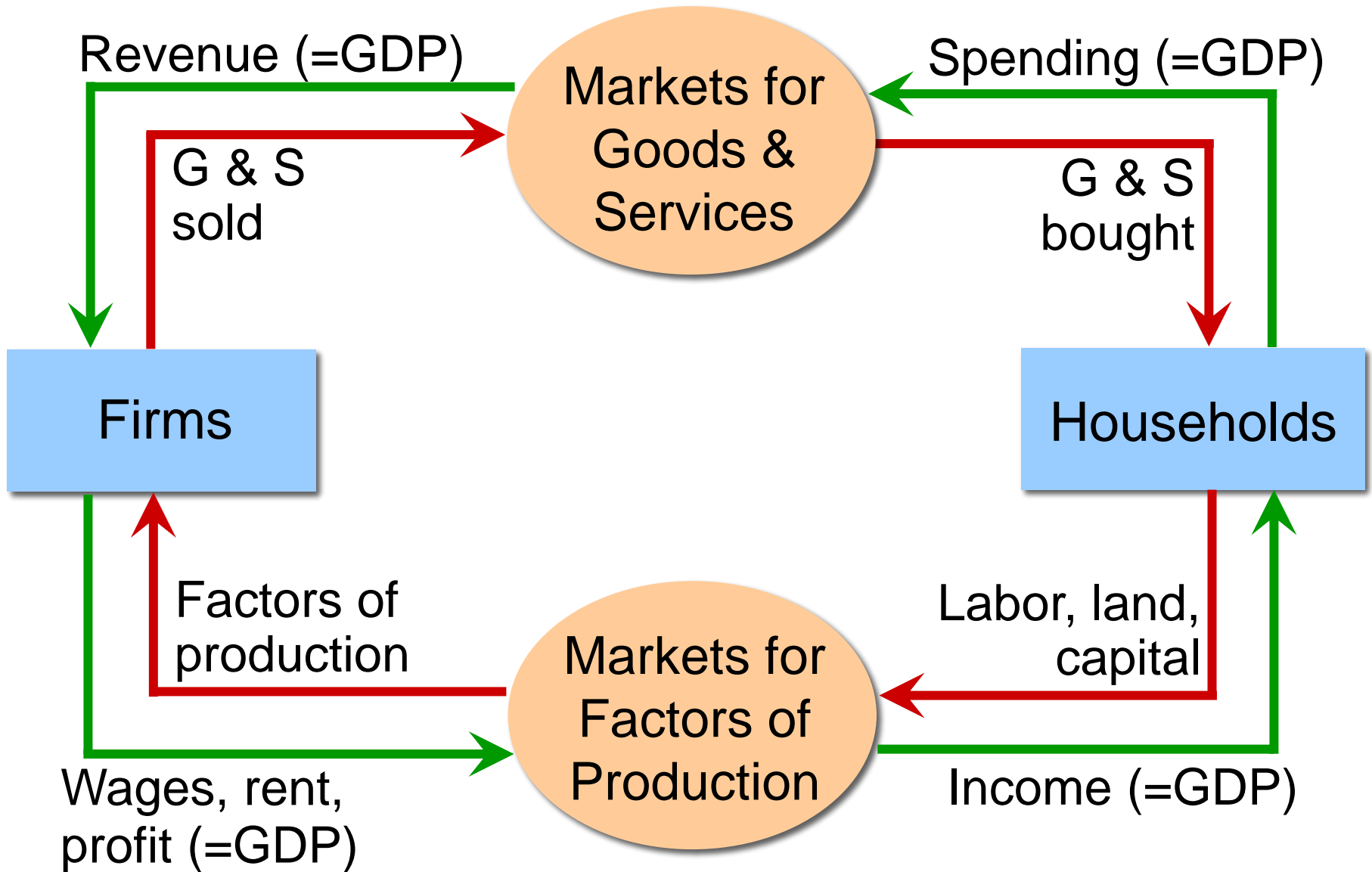
Firms

Households

Firms:

- buy/hire factors of production, use them to produce goods and services
- sell goods & services

THE CIRCULAR-FLOW DIAGRAM



THIS DIAGRAM OMITTS

The government

- Collects taxes, buys goods and services

The financial system

- Matches savers' supply of funds with borrowers' demand for loans

The foreign sector

- Trades goods and services, financial assets, and currencies with the country's residents

GROSS DOMESTIC PRODUCT (GDP) -

the market value of all final goods & services produced within a country in a given period of time.

GROSS DOMESTIC PRODUCT (GDP) IS...

...the **market value** of all final goods & services produced within a country in a given period of time.

Goods are valued at their market prices, so:

- All goods measured in the same units (\$ in the U.S.; CZK in CR)
- Things that don't have a market value are excluded, e.g., housework you do for yourself.

GROSS DOMESTIC PRODUCT (GDP) IS...

...the market value of **all** final goods & services produced within a country in a given period of time.

- GDP includes all items produced in the economy and sold legally in markets
- GDP excludes most items produced and sold illicitly. It also excludes most items that are produced and consumed at home.

GROSS DOMESTIC PRODUCT (GDP) IS...

...the market value of all **final** goods & services produced within a country in a given period of time.

- Final goods: intended for the end user
- Intermediate goods: used as components or ingredients in the production of other goods
- GDP only includes final goods—they already embody the value of the intermediate goods used in their production.

GROSS DOMESTIC PRODUCT (GDP) IS...

...the market value of all final goods & services produced within a country in a given period of time.

- GDP includes tangible goods (like cars, mountain bikes, beer)
- and intangible services (cleaning, concerts, cell phone service).
- GDP includes currently produced goods, not goods produced in the past.

GROSS DOMESTIC PRODUCT (GDP) IS...

...the market value of all final goods & services produced within a country in a given period of time.

- GDP measures the value of production that occurs within a country's borders, whether done by its own citizens or by foreigners located there.
- Usually a year or a quarter (3 months)

GDP COMPONENTS

Recall: GDP is total spending.

Four components:

- Consumption (C)
- Investment (I)
- Government Purchases (G)
- Net Exports (NX)

These components add up to GDP (denoted Y):

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

CONSUMPTION (C)

Consumption, C

Total spending by households on goods and services

Note on housing costs:

- For renters, C includes rent payments.
- For homeowners, C includes the imputed rental value of the house, but not the purchase price or mortgage payments
- Not included in C: purchases of new housing

INVESTMENT (I)

Investment, I

Total spending on goods that will be used in the future to produce more goods

- Business capital: business structures, equipment, and intellectual property products
- Residential capital: landlord's apartment building; a homeowner's personal residence
- Inventory accumulations: goods produced but not yet sold

“Investment” does not mean the purchase of financial assets like stocks and bonds.

GOVERNMENT PURCHASES (G)

Government purchases (G)

All spending on the goods and services purchased by the government

- At the federal, state, and local levels.

Excludes transfer payments

- Such as Social Security or unemployment insurance benefits.
- They are not purchases of goods and services

NET EXPORTS (NX)

Net exports, $NX = \text{exports} - \text{imports}$

- **Exports:** foreign spending on the economy's goods and services
- **Imports:** are the portions of C , I , and G that are spent on goods and services produced abroad

Adding up all the components of GDP gives:

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

U.S. GDP AND ITS COMPONENTS, 2021

	<i>Billions</i>	<i>% of GDP</i>	<i>Per capita</i>
Y	\$22,993	100.0	\$69,278
C	15,750	68.5	47,454
I	4,107	17.9	12,374
G	4,051	17.6	12,205
NX	-915	-4.0	-2,757

<https://fred.stlouisfed.org/series/PCECA>: Table 1.1.5

<https://research.stlouisfed.org/fred2/series/POPTHM?cid=104>

EXERCISE 1

GDP AND ITS COMPONENTS

In each of the following cases, determine how much GDP and each of its components is affected (if at all).

- A. Marek spends czk 3000 to buy his girlfriend dinner at the finest restaurant in Brno.
- B. Roman spends czk 20000 on a new laptop to use in her publishing business. The laptop was built in China.
- C. Paulina spends czk 15000 on a computer to use in her editing business. She got last year's model on sale for a great price from a local manufacturer.
- D. Škoda builds czk 50 billion worth of cars, but consumers only buy czk 47 billion worth of them.

EXERCISE 1

SOLUTIONS

- A.** Marek spends czk 3000 to buy his girlfriend dinner at the finest restaurant in Brno.

Consumption and GDP rise by czk 3000.

- B.** Roman spends czk 20000 on a new laptop to use in her publishing business. The laptop was built in China.

Investment rises by czk 20000, net exports fall by czk 20000, GDP is unchanged.

EXERCISE 1

SOLUTIONS

- C. Paulina spends czk 15000 on a computer to use in her editing business. She got last year's model on sale for a great price from a local manufacturer.

Current GDP and investment do not change, because the computer was built last year.

- D. Škoda builds czk 50 billion worth of cars, but consumers only buy czk 47 billion of them.

Consumption rises by czk 47 billion, inventory investment rises by czk 3 billion, and GDP rises by czk 50 billion.

REAL VS NOMINAL GDP

Total spending rises from one year to the next

- Economy — producing a larger output of goods and services
- And/or goods and services are being sold at higher prices

Nominal GDP

- Production of goods and services
- Valued at current prices

REAL VS NOMINAL GDP

Nominal GDP

- Values output using current prices
- Not corrected for inflation

Real GDP

- Values output using the prices of a base year
- Is corrected for inflation

For the base year

$$\text{Nominal GDP} = \text{Real GDP}$$

EXAMPLE

Compute nominal GDP in each year:

$$2014: \$10 \times 400 + \$2 \times 1000 = \$6,000$$

$$2015: \$11 \times 500 + \$2.50 \times 1100 = \$8,250$$

$$2016: \$12 \times 600 + \$3 \times 1200 = \$10,800$$

Increase:


37.5%

30.9%

	Pizza		Latte	
<i>year</i>	<i>P</i>	<i>Q</i>	<i>P</i>	<i>Q</i>
2014	\$10	400	\$2.00	1000
2015	\$11	500	\$2.50	1100
2016	\$12	600	\$3.00	1200

EXAMPLE

Compute real GDP in each year, using 2014 as the base year:

	Pizza \$10		Latte \$2.00	
<i>year</i>	<i>P</i>	<i>Q</i>	<i>P</i>	<i>Q</i>
2014	\$10	400	\$2.00	1000
2015	\$11	500	\$2.50	1100
2016	\$12	600	\$3.00	1200

Increase:

$$\begin{array}{l}
 2014: \quad \$10 \times 400 + \$2 \times 1000 = \$6,000 \\
 2015: \quad \$10 \times 500 + \$2 \times 1100 = \$7,200 \\
 2016: \quad \$10 \times 600 + \$2 \times 1200 = \$8,400
 \end{array}$$

} 20.0%
} 16.7%

EXAMPLE

<i>year</i>	<i>Nominal GDP</i>	<i>Real GDP</i>
2014	\$6000	\$6000
2015	\$8250	\$7200
2016	\$10,800	\$8400

In each year,

- nominal GDP is measured using the (then) current prices.
- real GDP is measured using constant prices from the base year (2014 in this example).

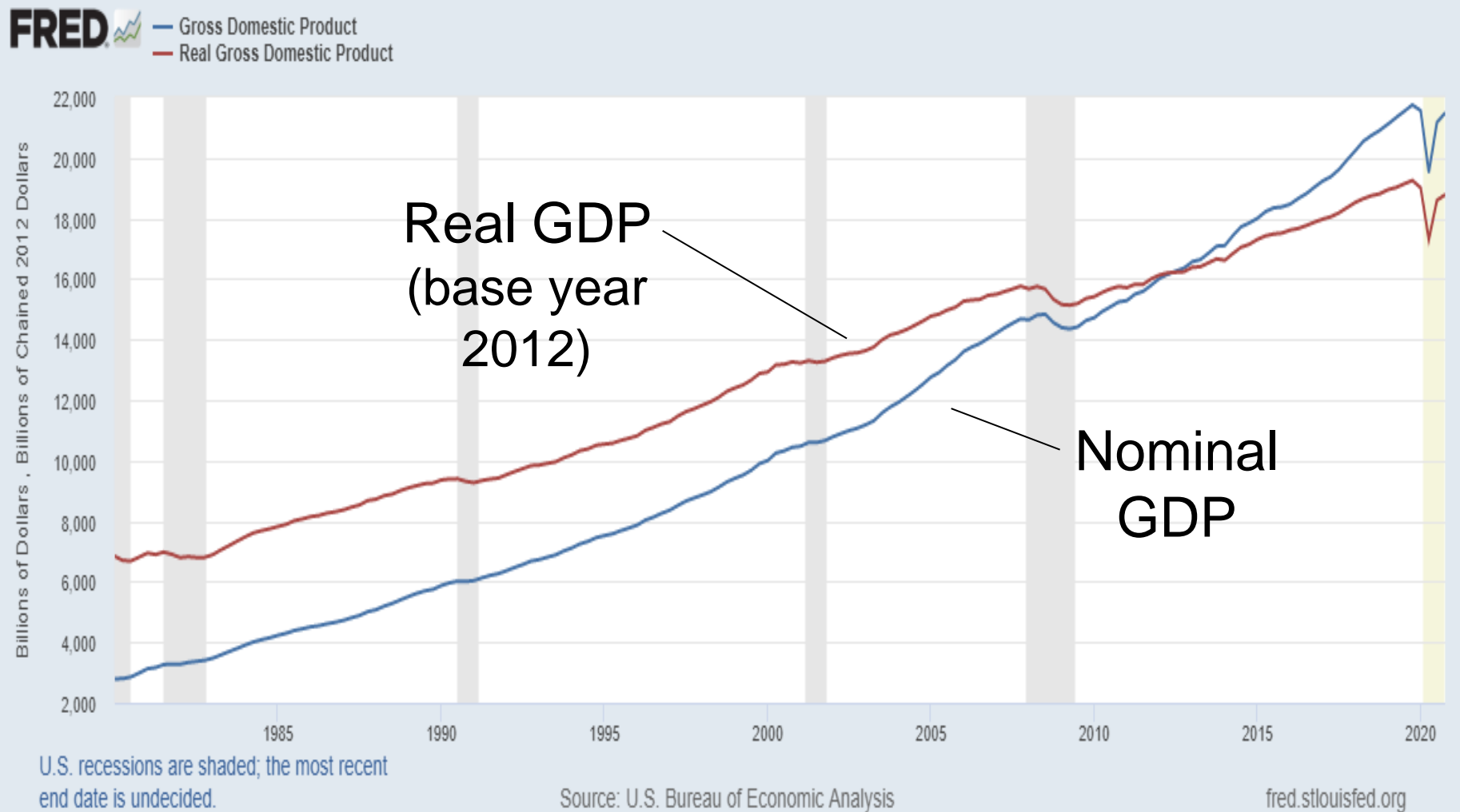
The change in nominal GDP reflects both prices and quantities.

<i>year</i>	<i>Nominal GDP</i>		<i>Real GDP</i>	
2014	\$6000	}	\$6000	}
2015	\$8250		\$7200	
2016	\$10,800		\$8400	
		37.5%		20.0%
		30.9%		16.7%

The change in real GDP is the amount that GDP would change if prices were constant (i.e., if zero inflation).

Hence, real GDP is corrected for inflation.

NOMINAL AND REAL GDP IN THE U.S., 1980–2020



THE GDP DEFLATOR

GDP deflator

- A measure of the overall level of prices.

$$= 100 \times \frac{\textit{nominal GDP}}{\textit{real GDP}}$$

- Measures the current level of prices relative to the level of prices in the base year

Economy's inflation rate

- Compute the percentage increase in the GDP deflator from one year to the next

Compute the GDP deflator in each year:

<i>year</i>	<i>Nominal GDP</i>	<i>Real GDP</i>	<i>GDP Deflator</i>	
2014	\$6000	\$6000	100.0	} 14.6%
2015	\$8250	\$7200	114.6	
2016	\$10,800	\$8400	128.6	} 12.2%

$$2014: 100 \times (6000/6000) = 100$$

$$2015: 100 \times (8250/7200) = 114.6$$

$$2016: 100 \times (10,800/8400) = 128.6$$

ACTIVE LEARNING 2

	2014 (base year)		2015		2016	
	<i>P</i>	<i>Q</i>	<i>P</i>	<i>Q</i>	<i>P</i>	<i>Q</i>
Good A	\$30	900	\$31	1000	\$36	1050
Good B	\$100	192	\$102	200	\$100	205

Use the above data to solve these problems:

- A. Compute nominal GDP in 2014.
- B. Compute real GDP in 2015.
- C. Compute the GDP deflator in 2016.

ACTIVE LEARNING 2

	2014 (base year)		2015		2016	
	<i>P</i>	<i>Q</i>	<i>P</i>	<i>Q</i>	<i>P</i>	<i>Q</i>
Good A	\$30	900	\$31	1000	\$36	1050
Good B	\$100	192	\$102	200	\$100	205

A. Compute nominal GDP in 2014.

$$\$30 \times 900 + \$100 \times 192 = \$46,200$$

B. Compute real GDP in 2015.

$$\$30 \times 1000 + \$100 \times 200 = \$50,000$$

ACTIVE LEARNING 2

	2014 (base year)		2015		2016	
	<i>P</i>	<i>Q</i>	<i>P</i>	<i>Q</i>	<i>P</i>	<i>Q</i>
Good A	\$30	900	\$31	1000	\$36	1050
Good B	\$100	192	\$102	200	\$100	205

C. Compute the GDP deflator in 2016.

$$\text{Nom GDP} = \$36 \times 1050 + \$100 \times 205 = \$58,300$$

$$\text{Real GDP} = \$30 \times 1050 + \$100 \times 205 = \$52,000$$

$$\begin{aligned} \text{GDP deflator} &= 100 \times (\text{Nom GDP}) / (\text{Real GDP}) \\ &= 100 \times (\$58,300) / (\$52,000) = 112.1 \end{aligned}$$

GDP AND ECONOMIC WELL-BEING

Real GDP per capita

- Main indicator of the average person's standard of living

But GDP is not a perfect measure of well-being.

Why?

GDP DOES NOT VALUE:

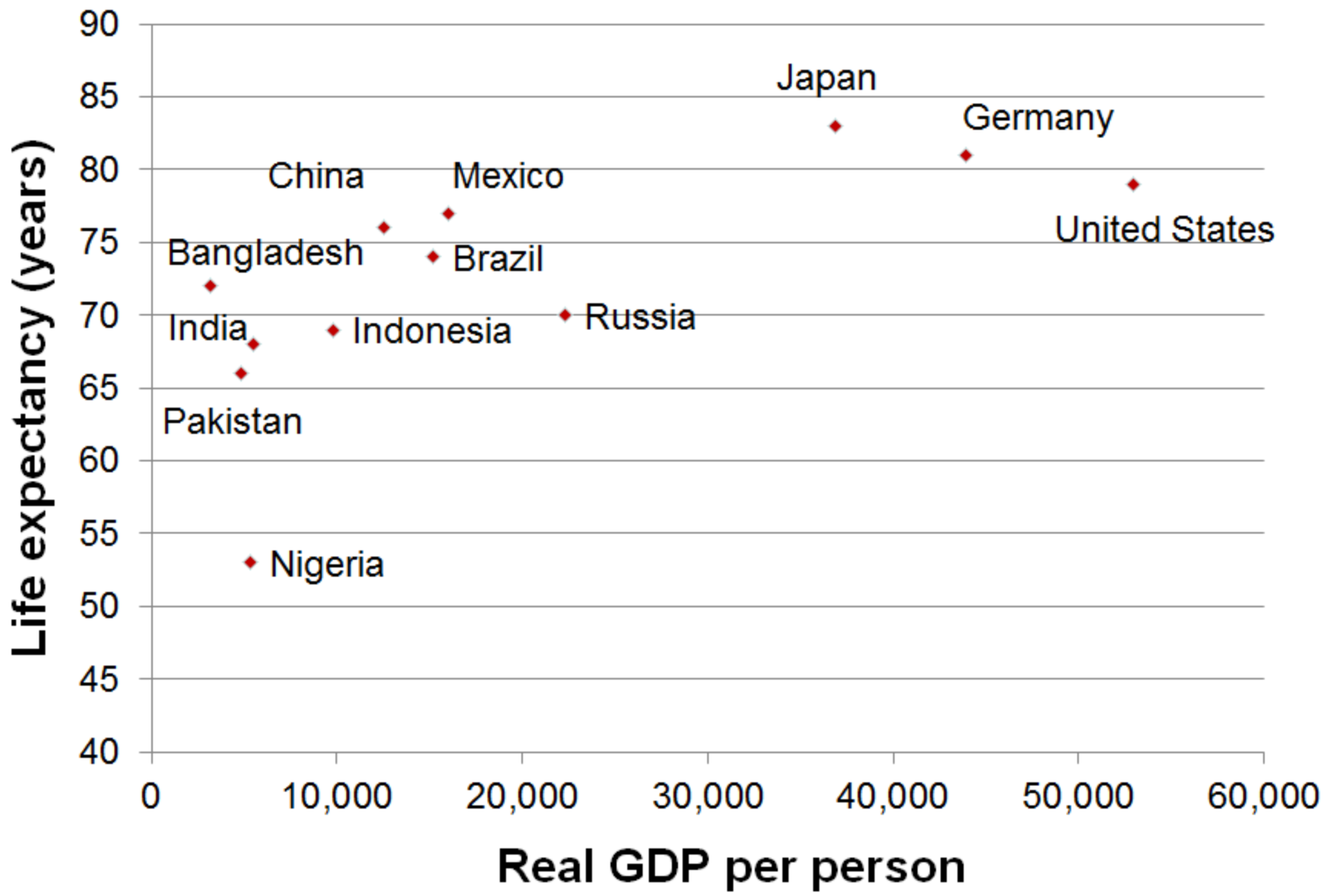
- The quality of the environment/culture/education
- Health of children
- Leisure time
- Non-market activity, such as the childcare a parent provides at home
- An equitable distribution of income

THEN WHY DO WE CARE ABOUT GDP?

Having a large GDP enables a country to afford

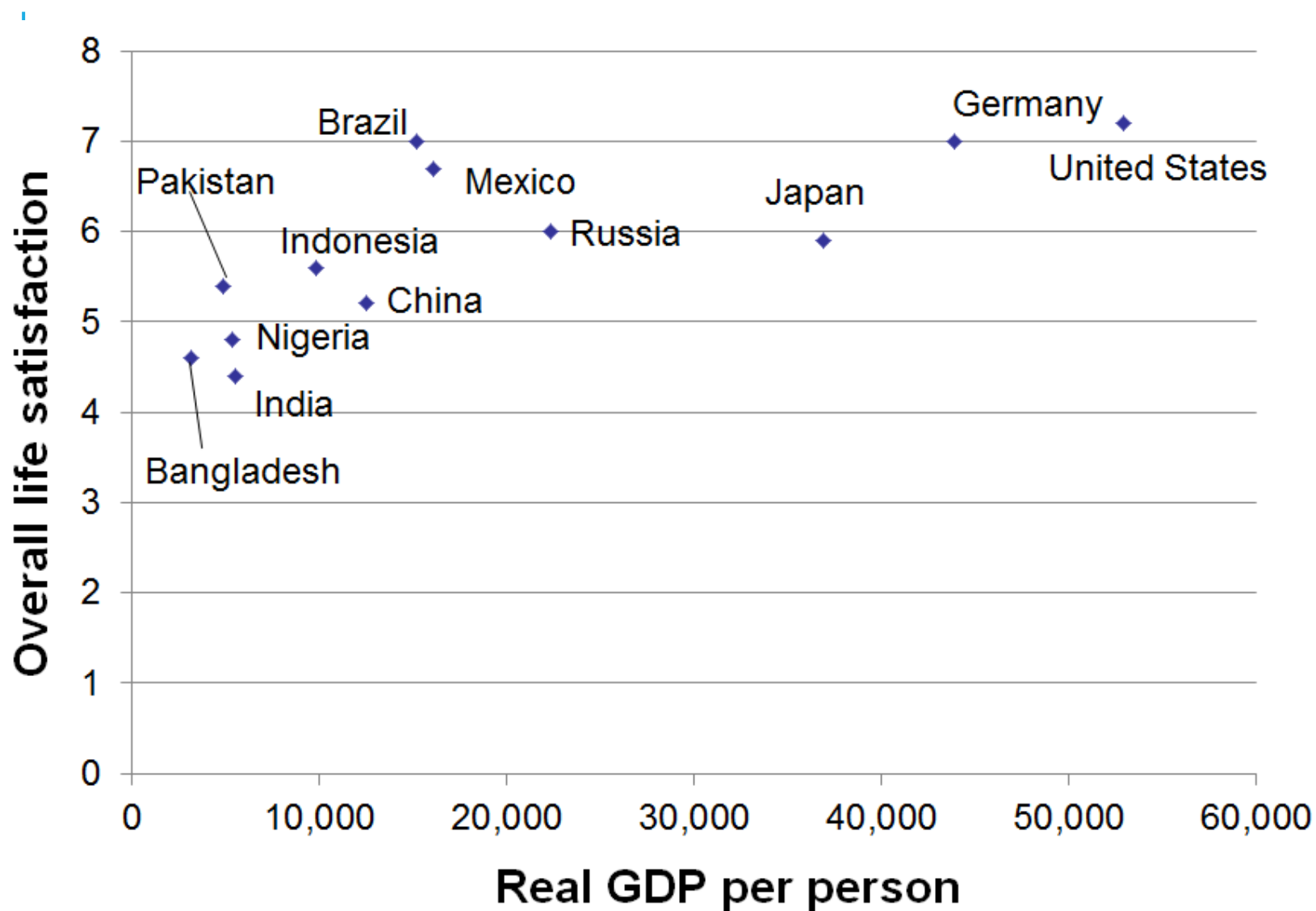
- Better schools, a cleaner environment, health care, etc.

Many indicators of the quality of life are positively correlated with GDP. For example...





GDP AND OVERALL LIFE SATISFACTION (0 TO 10 SCALE) IN 12 COUNTRIES



SUMMARY

- GDP measures a country's total income and expenditure.
- The four spending components of GDP include: Consumption, Investment, Government Purchases, and Net Exports.
- Nominal GDP is measured using current prices. Real GDP is measured using the prices of a constant base year and is corrected for inflation.
- GDP is the main indicator of a country's economic well-being, even though it is not perfect.