Macroeconomics I

- Lecturer: Hieu Nguyen
- Ph.D. candidate at CERGE-EI, Prague
- Email: 254279@mail.muni.cz
- Text-book: Mankiw, Principles of Economics/Macroeconomics
- Lectures/Seminars: Tuesday 10:00-11:50 P312
- Seminars: Tuesday 12:00-13:50 S305 or 14:00-15:50 S309
- Office hours: agreed on request via email

Grading

- Seminar participation *(5%):* and seminar engagement *(5%)*

- 2 Quizzes *(10% * 2 = 20%):* week 4 and week 9

- Midterm exam (*30%*): the week following the reading week

- Final exam (*40%*): 4 exam dates, three attempts, passing threshold of 50/100 pts (once students get 50+ pts, students cannot register for another attempt)

- All assessments are close-book, only calculator is allowed.

N. GREGORY MANKIW

PRINCIPLES OF
MACROECONOMICS
Eighth Edition

Chapter 10

Measuring a Nation's Income

Premium PowerPoint Slides by:
V. Andreea CHIRITESCU
Eastern Illinois University

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Learning outcomes

After learning this chapter, students are expected to understand:

- Principles of economics
- Circular-flow diagram
- GDP and its components
- GDP deflator calculation

Principles of Economics

Principles of decision making are:

- People face tradeoffs;
- The cost of any action is measured in terms of foregone opportunities;
- Rational people make decisions by comparing marginal costs and marginal benefits;
- People respond to incentives;

Principles of Economics

Principles of interactions among people are:

- Trade can be mutually beneficial;

- Markets are usually a good way of coordinating trade;

- Govt 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 are:

- 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.

Look for the answers to these 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?

Economics

- Microeconomics
  - Study of how households and firms
    - Make decisions
    - Interact in markets
- Macroeconomics
  - Study of economy-wide phenomena
    - Including inflation, unemployment, and economic growth

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).

The Circular-Flow Diagram

Households:

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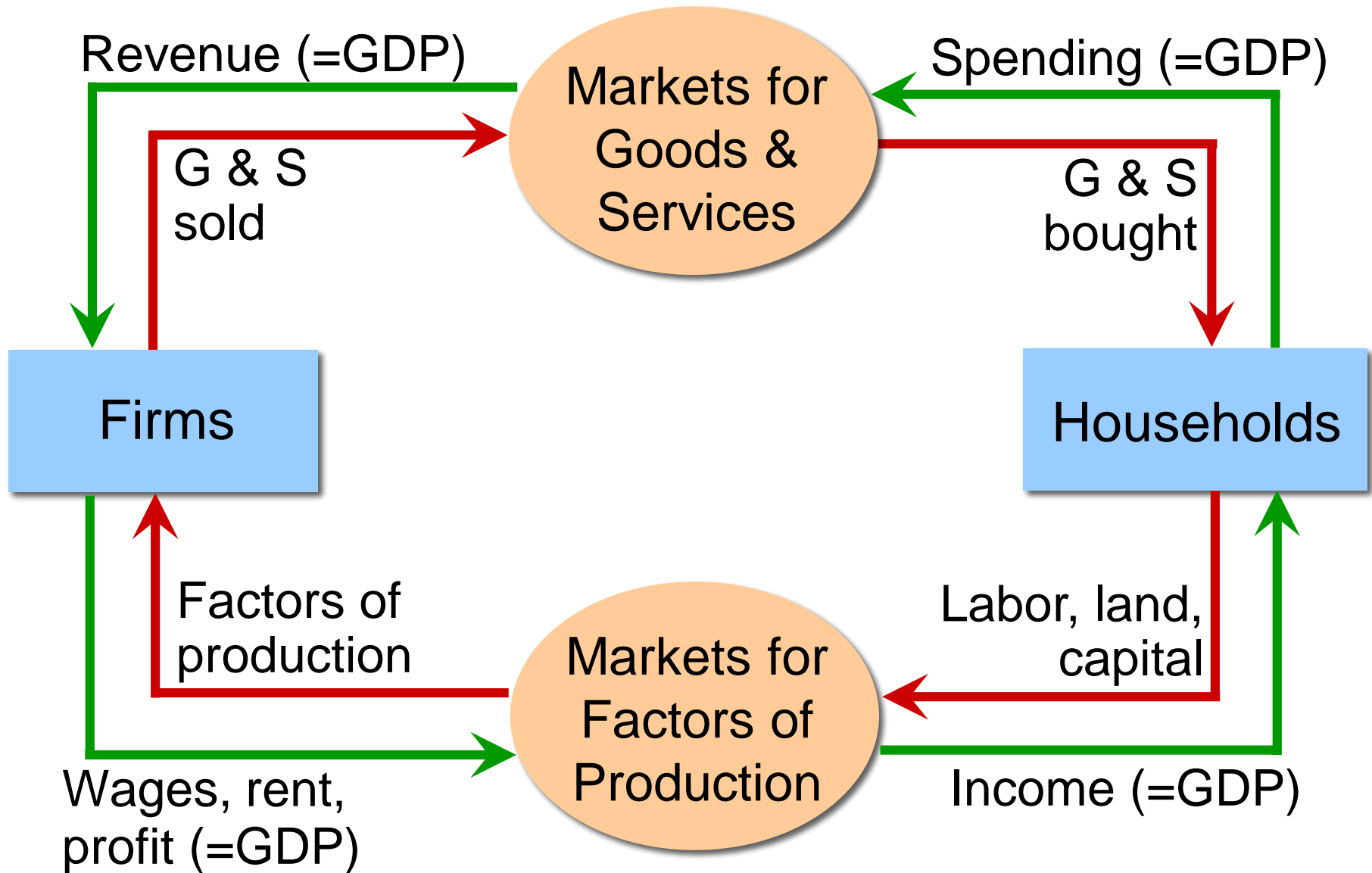- buy and consume goods & services

Firms

Households

Firms:

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

The Circular-Flow Diagram

Revenue (=GDP)

G & S
sold

Markets for Goods & Services

Spending (=GDP)

G & S
bought

Firms

Households

Factors of
production

Markets for Factors of Production

Labor, land,
capital

Wages, rent,
profit (=GDP)

Income (=GDP)

This Diagram Omits

- 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) Is...

- ...the <mark>market value</mark> 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 (e.g., dollars 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 <mark>final</mark> goods & services produced within a country in a given period of time.

  – <u>Final goods</u>: intended for the end user
  – <u>Intermediate goods</u>: 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 = exports – 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, 2020

	Billions	*% of GDP*	*Per capita*
Y	$20,935	100.0	$63,538
C	14,147	67.6	42,936
I	3,602	17.2	10,934
G	3,831	18.3	11,626
NX	-645	-3.1	-1,957

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. Romane 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. Romane 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

- Nominal GDP
  - Values output using current prices
  - <u>Not</u> corrected for inflation
- Real GDP
  - Values output using the prices of <u>a base year</u>
  - <u>Is</u> corrected for inflation
- For the base year

  Nominal GDP = Real GDP

EXAMPLE:

Compute nominal GDP in each year:

Increase:

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

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

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

37.5%

30.9%

| year | Pizza | | Latte | |
	P	Q	P	Q
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:

year	Pizza $10		Latte $2.00	
	P	**Q**	**P**	**Q**
2014	$10	400	$2.00	1000
2015	$11	500	$2.50	1100
2016	$12	600	$3.00	1200

Increase:

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

20.0%

2015: $10 x 500 + $2 x 1100   = $7,200

16.7%

2016: $10 x 600 + $2 x 1200   = $8,400

EXAMPLE:

year	Nominal GDP	Real GDP
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).
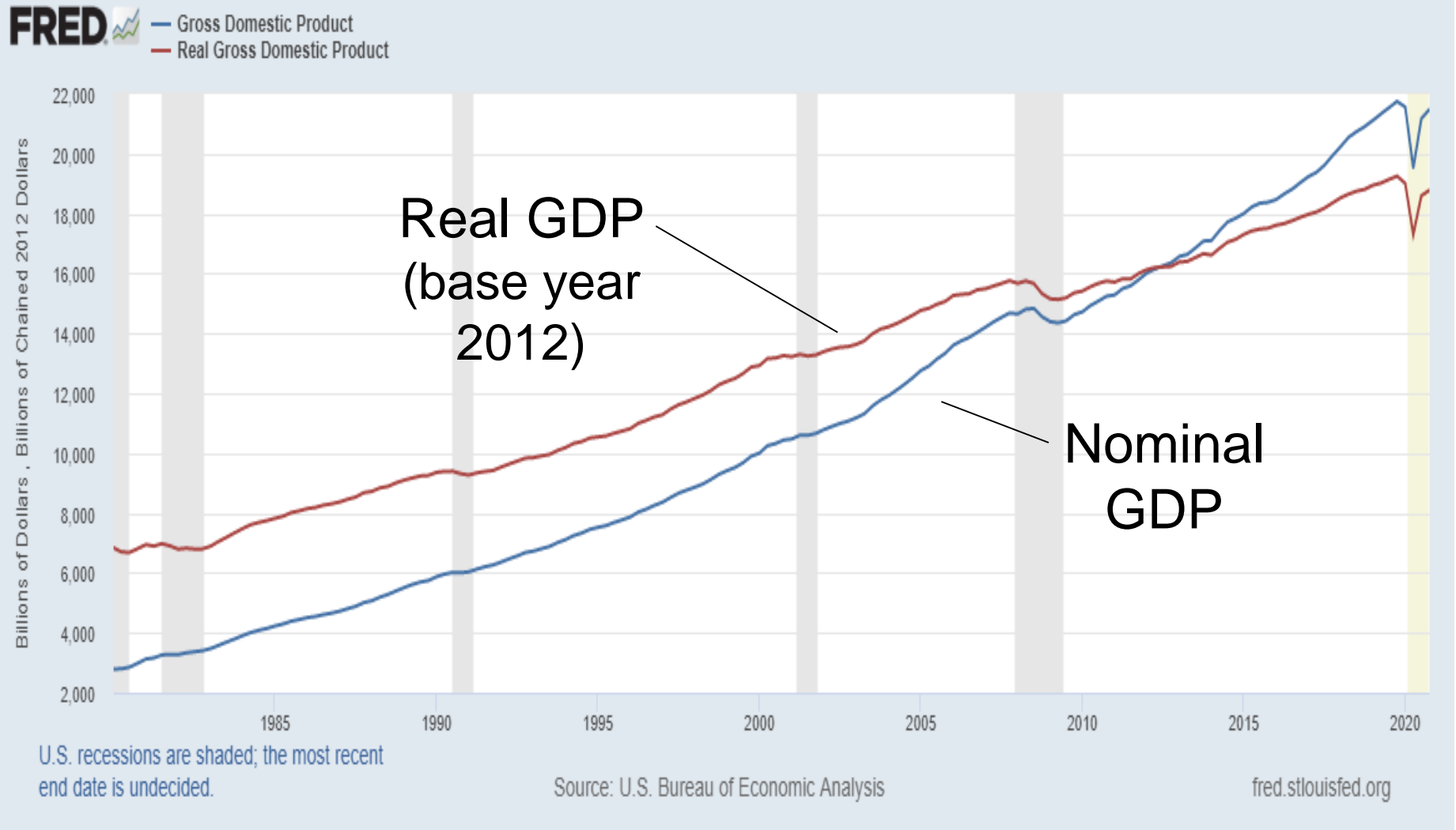
EXAMPLE:

- The <u>change in nominal GDP</u> reflects both prices and quantities.

year	Nominal GDP		Real GDP	
2014	$6000		$6000	
		37.5%		20.0%
2015	$8250		$7200	
		30.9%		16.7%
2016	$10,800		$8400	

- The <u>change in real GDP</u> 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.

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

    - 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

EXAMPLE:

- Compute the GDP deflator in each year:

year	Nominal GDP	Real GDP	GDP Deflator	
2014	$6000	$6000	100.0	
2015	$8250	$7200	114.6	14.6%
2016	$10,800	$8400	128.6	12.2%

2014: 100 x (6000/6000) = 100

2015: 100 x (8250/7200) = 114.6

2016: 100 x (10,800/8400) = 128.6

	2014 (base year)		2015		2016	
	P	Q	P	Q	P	Q
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 — Computing GDP

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

A. Compute nominal GDP in 2014.

$30 x 900 + $100 x 192 = $46,200

B. Compute real GDP in 2015.

$30 x 1000 + $100 x 200 = $50,000

Active Learning 2   Computing GDP

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

C. Compute the GDP deflator in 2016.

Nom GDP = $36 x 1050 + $100 x 205 = $58,300

Real GDP = $30 x 1050 + $100 x 205 = $52,000

GDP deflator = 100 x (Nom GDP)/(Real GDP)

= 100 x ($58,300)/($52,000) = 112.1

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.
  - Robert Kennedy issued a very eloquent yet harsh criticism of GDP:

"… does not allow for the health of our children, the quality of their education, or the joy of their play.

It does not include the beauty of our poetry or the strength of our marriages, the intelligence of our public debate or the integrity of our public officials.

It measures neither our courage, nor our wisdom, nor our devotion to our country.

It measures everything, in short, except that which makes life worthwhile, and it can tell us everything about America except why we are proud that we are Americans."

GDP Does Not Value:

– The quality of the environment

– Leisure time

– Non-market activity, such as the childcare a parent provides at home

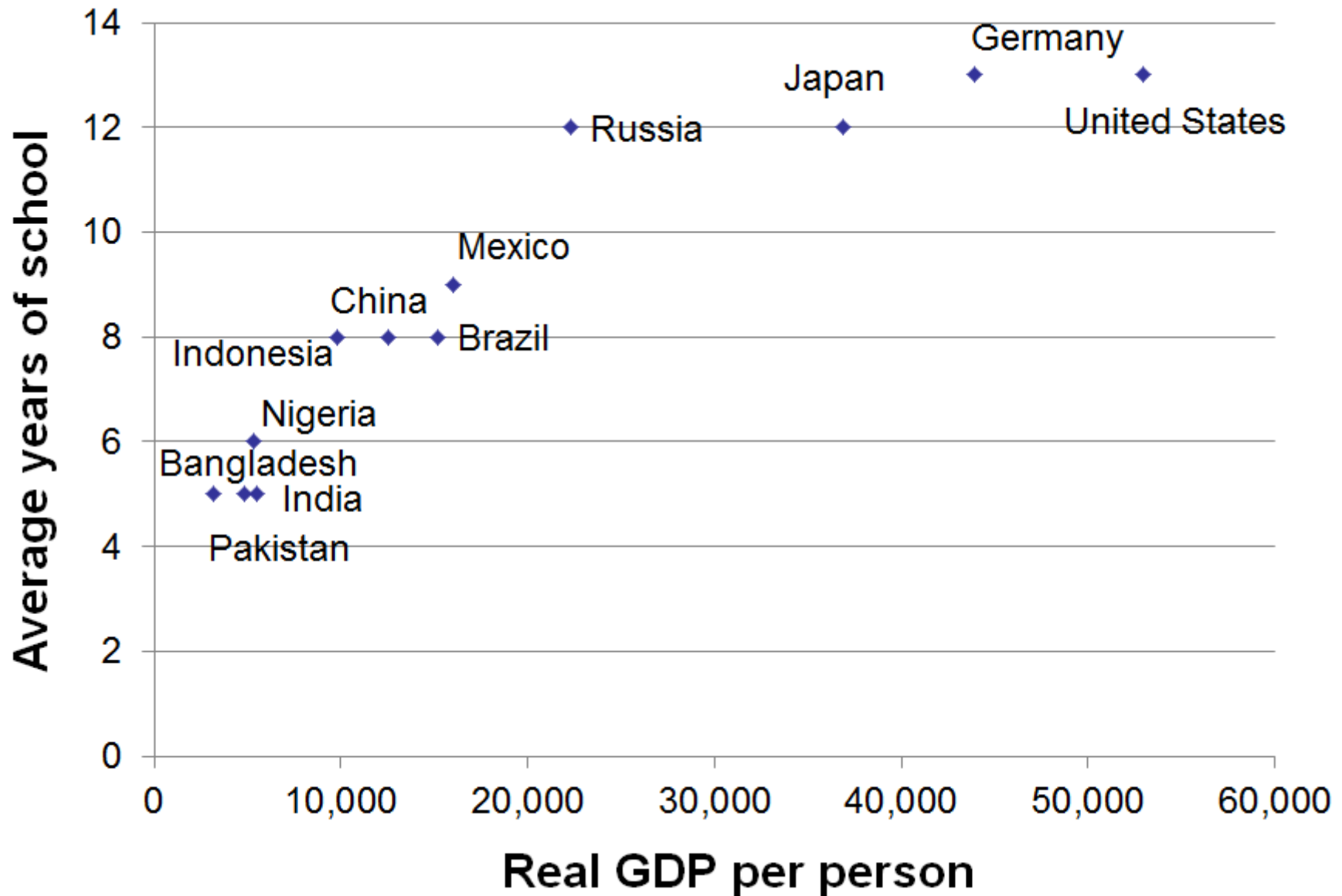– An equitable distribution of income

Then Why Do We Care About GDP?

- Having a large GDP enables a country to afford

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

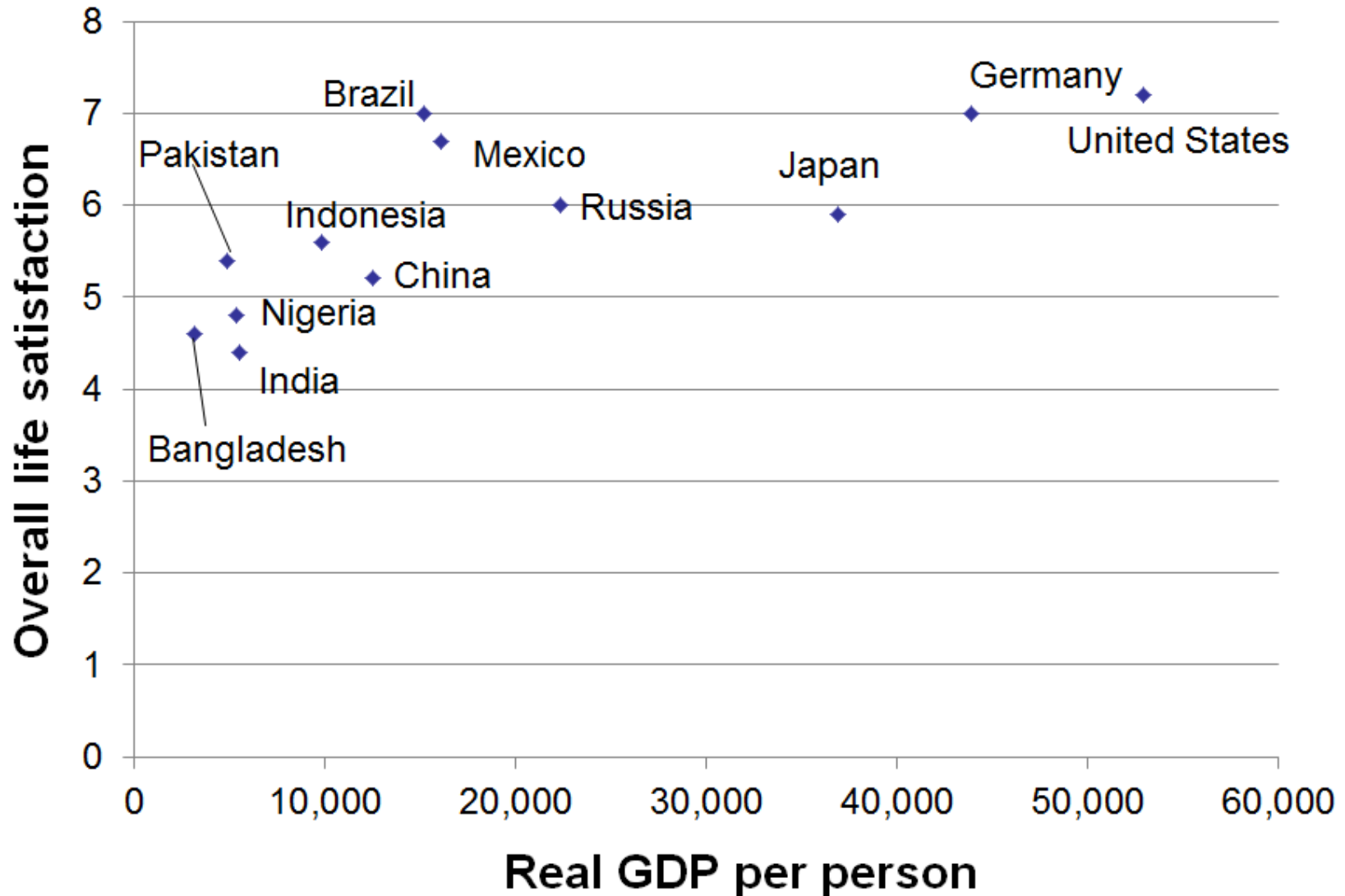- Many indicators of the quality of life are positively correlated with GDP. For example…

GDP and Life Expectancy in 12 countries
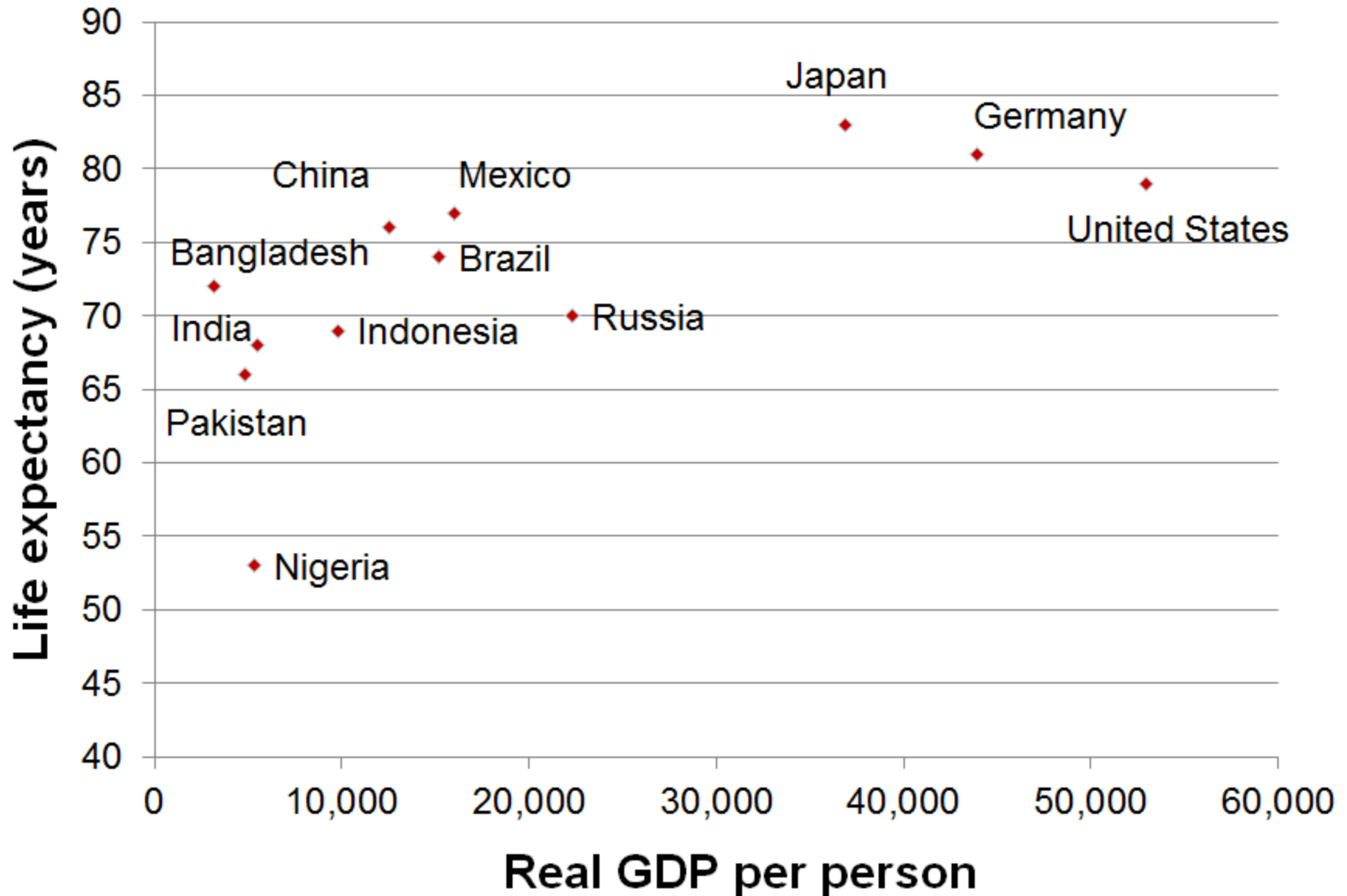
GDP and Average Schooling in 12 countries

GDP and Overall Life Satisfaction (0 to 10 scale) in 12 countries

Summary

- Gross Domestic Product (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.