GDP MEASUREMENT and NATIONAL ACCOUNTS

Andrzej Cwynar, UITM Rzeszów

Lecture objectives

- How is GDP measured?
- What are other measures of macroeconomic activity?
- Can GDP be a proxy for the welfare?

- **GDP and other metrics of macroeconomic activity**
    - **nominal GDP vs. real GDP**
    - **GNP**
    - **NNP**
    - **NI**

Gross domestic product (GDP)

- **GDP** is the market value of the final goods and services produced within a country in a given time period (typically one year) without regard for the ownership of inputs.

Real GDP vs. nominal GDP

- **Real GDP** is the value of final goods and services produced in a given year when valued at the prices of a reference base year (**GDP in fixed prices**).

- **Nominal GDP** is the value of final goods and services produced in a given year when valued at the prices of that year (**GDP in current prices**).

Real GDP vs. nominal GDP: example

	2000 (base)				2009				2014			
Goods	P	Q	N	R	P	Q	N	R	P	Q	N	R
A	2	10	20	20	3	12	36	24	5	15	75	30
B	7	1	7	7	9	2	18	14	12	3	36	21
GDP			27	27			54	38			111	51

The virtue of real GDP

- By comparing the value of production in the two years at the same prices, we reveal the change in production.
- Changes in nominal GDP are driven not only by changes in physical production but also by changes in prices. Changes in real GDP are driven solely by changes in physical production.

Gross national product (GNP)

- **GNP** is the market value of the final goods and services produced by all citizens of a country in a given time period (typically one year) without regard for the location of inputs.

GDP vs. GNP

- GDP notion is based on the **LOCATION** of inputs.
- GNP notion is based on the **OWNERSHIP** of inputs.
- For majority of countries the difference between GDP and GNP is small (e.g. for US economy it is smaller than 1%).

- GNP = GDP + net production manufactured **abroad**

Check point: test your understanding

- Is nominal GDP always bigger than real GDP?
- Is GNP always bigger than GDP?

(in both cases assume that we consider the same country)

Net National Product (NNP)

- NNP = GNP – depreciation

- **Depreciation** is the estimate of the amount of capital (invested in assets of the economy) that will wear out or will be used up in producing GNP.

National income (NI)

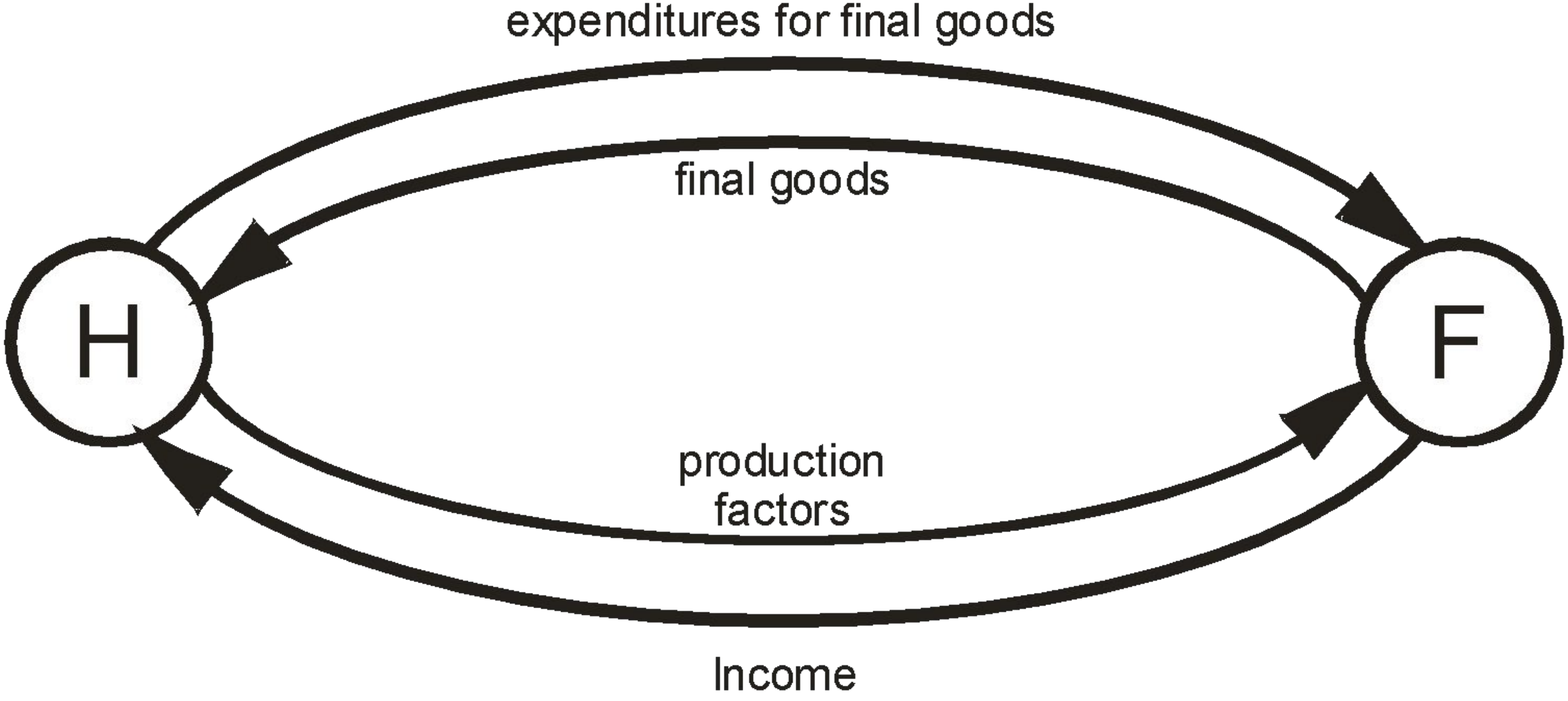
- NI = NNP – indirect taxes
- Indirect taxes are subtracted because they have no equivalent in production.
- **Direct taxes** – taxes put on income directly (income taxes)
- **Indirect taxes** – taxes put on income indirectly (sales and excise taxes)

- **How is GDP really measured? Circular flow model**

Four groups of economic subjects

- Domestic households
- Domestic firms
- Domestic government
- Foreign sector

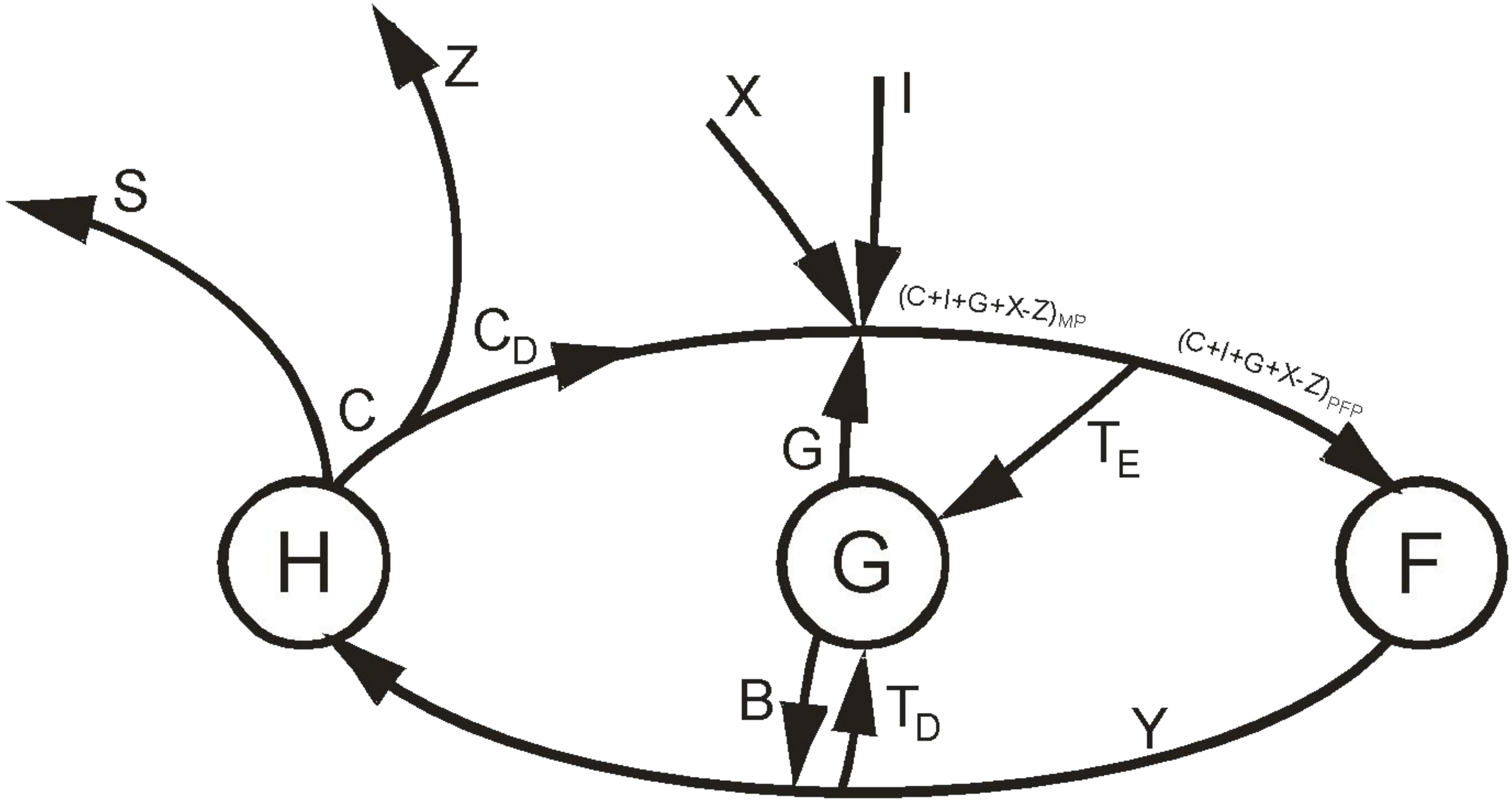
Two-factor circular flow model



GDP: three measurement methods

- Although GDP is called „product”, we can measure it in three ways:
  - based on production,
  - based on expenditures,
  - based on income.

Complete circular flow model



GDP account: important rules

- Each method avoids double-counting
- Production method is based on net values
- Expenditure method is based on final goods
- Expenditure for house or flat is always counted as a part of investment
- Financial assets are not included in the account
- Foreign goods are not included in the account

Double-counting: examples

- Second-hand goods
- Intermediate goods vs. final goods
- Gross value of production vs. net value of production

Important vocabulary

- **Intermediate goods**: goods used in the production of other goods.
- **Final goods**: goods that are destined for final consumption.
- **Net value (value added)** =
  gross value – value of intermediate goods

Check point: true / false test

- When you buy used car, the transaction is included in GDP account for the year in which it is done.
- One of the main drawbacks of GDP is that it does not include the value of such services as healthcare.
- Total flour produced in Poland is classified as the intermediate good.
- We would be able to increase our GDP very quickly if we agreed to work 80 hours per week.
- The expenditures for paper, computers and fuel made by General Electric are classified as part of consumption.
- Net export may be positive or negative.

Check point: true / false test (cont.)

- Spending on new houses represent the only one type of the expenditures made by households that are not classified as part of consumption.
- If Ford sells more cars, then GDP of the USA increases no matter who purchases the cars – the Americans or other nations.
- If General Motors sells less than it produced, then the increase in GDP is smaller than it would be assuming that all cars were sold.
- Inclusion of the intermediate goods in the GDP account would lead to its decline.

- **Can GDP be a proxy for the welfare?**

GDP per capita

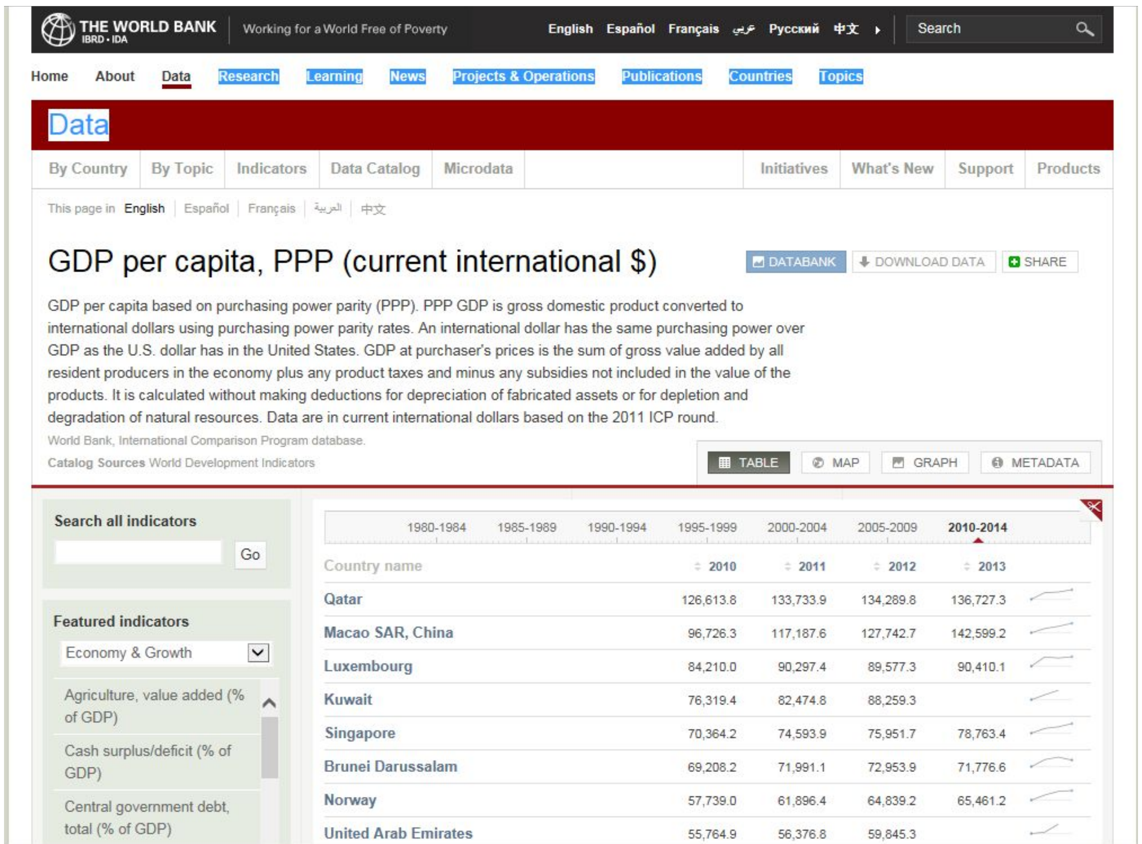
- **GDP per capita** = the gross income received by the average resident of a country
- GDP per capita = GDP / number of residents

PPP GDP per capita

- **PPP GDP per capita**: GDP per capita presented on a purchasing power parity basis.

- **Purchasing power parity (PPP)**: an economic theory that estimates the amount of adjustment needed on the exchange rate between countries in order for the exchange to be equivalent to each currency's purchasing power.

PPP GDP per capita across the world



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GDP per capita, PPP (current international $)

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GDP per capita based on purchasing power parity (PPP). PPP GDP is gross domestic product converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current international dollars based on the 2011 ICP round.

World Bank, International Comparison Program database.

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Economy & Growth

Agriculture, value added (% of GDP)

Cash surplus/deficit (% of GDP)

Central government debt, total (% of GDP)

1980-1984 | 1985-1989 | 1990-1994 | 1995-1999 | 2000-2004 | 2005-2009 | 2010-2014

Country name	2010	2011	2012	2013
Qatar	126,613.8	133,733.9	134,289.8	136,727.3
Macao SAR, China	96,726.3	117,187.6	127,742.7	142,599.2
Luxembourg	84,210.0	90,297.4	89,577.3	90,410.1
Kuwait	76,319.4	82,474.8	88,259.3	
Singapore	70,364.2	74,593.9	75,951.7	78,763.4
Brunei Darussalam	69,208.2	71,991.1	72,953.9	71,776.6
Norway	57,739.0	61,896.4	64,839.2	65,461.2
United Arab Emirates	55,764.9	56,376.8	59,845.3	

Further reading (World Bank site)

- http://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD/countries/1W?order=wbapi_data_value_2012%20wbapi_data_value%20wbapi_data_value-last&sort=desc&display=default

What IS under control in PPP GDP per capita measurement

- Differences in currencies among countries
- Differences in prices among countries

What IS NOT under control in PPP GDP per capita measurement

- Division of income in the society
- Non-official production / underground economy Transactions that do not take place in organized markets
- Negative externalities of production

How can welfare (economic well-being) be measured?

- Net Economic Welfare (NEW) designed by W. Nordhaus and J. Tobin
- Human Development Index (HDI) used by United Nations

Is hapiness economic issue?

- The question „Can money buy hapinness?” was the subject of the scientific research.
- For example, David Blanchflower of Dartmouth College and Andrew Oswald of Warwick University were asking individuals to describe themselves as „happy, pretty happy, or not too happy” for almost 30 years.

Is hapiness economic issue? (cont.)

- Some interesting observations:
  - despite substantial increase in GDP per capita, the happiness level decreased – on average – in the USA and remained flat in the UK
  - stable marriage is worth $100 000 in terms of equivalent reported satisfaction
  - men's happiness has risen relative to that of women over the last 30 years
  - reported hapiness appears to peak at age 40

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Textbooks

- O'Sullivan & Sheffrin: chapter 5, „Measuring a Nation's Production and Income"
- Krugman & Wells: chapter 23, „Śledząc stan gospodarki"