GDP: Tracking The Economy

WHAT YOU WILL LEARN IN THIS CHAPTER

How to **track the performance of the economy**:

- **GDP** and the **three ways of calculating it**
- **Real GDP** and **Nominal GDP**
- GDP Deflator, CPI, PPI
- GDP per Capita

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National Income Accounting

The national income and product accounts (NIPA)

~ Simon Kuznets, 1930s

- measure a nation's economic performance
- compare income -output to that of other nations
- track the economy's condition throughout the business cycle

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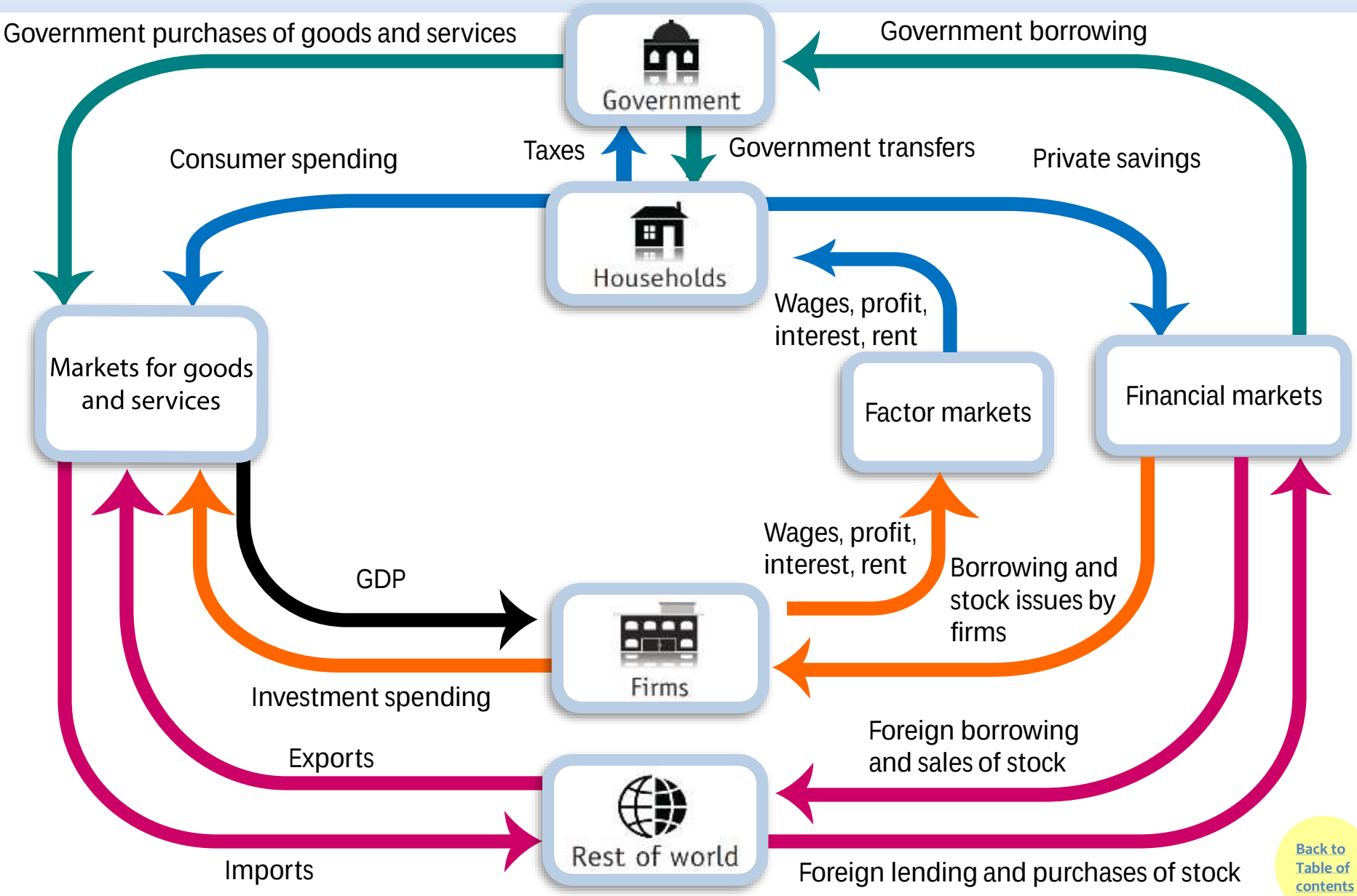
An Expanded Circular-Flow Diagram



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What Is GDP?

Gross domestic product (GDP):

the market value

of all *final* goods/services

produced within a country

in a *year*.

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The National Accounts

Final goods and services: goods and services sold to the final end-users.

Intermediate goods and services: goods and services (bought from one firm by another firm) that are **inputs** for production of **final goods and services.**

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What Is GDP?

… Produced…

GDP measures *production.*

- Sale of *used* goods: *NOT* included.
- Sale of *financial assets*, such as stocks and bonds, are *NOT* included.

This building's value was counted when it was built.

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GDP v. GNP

…Within a Country…

Only production that takes place within the borders of a country is included in GDP.

Examples:

Cars produced in Mexico by American firms: *NOT* included in the U.S. GDP.

Cars produced in the U.S. by Japanese firms *ARE* included in the U.S. GDP.

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What Is GDP?

…in a *year*.

GDP is equivalent to *annual income = annual output = aggregate income/output = aggregate spending/expenditures:*

it measures a rate of production during a given period.

U.S. GNP > GDP by 0.7%
Ireland's GNP < GDP by 15%
How about GSP?

What is the U.S. per capita nominal GDP and per capita real GDP?

For the current quarter's GDP data, visit the U.S. Bureau of Economic Analysis here.

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(Agg) Spending = (Agg) Income

It doesn't matter HOW we measure the production, since one person's spending is another's income.

$10 for a shave? Barber's income of $10 = customer's spending of $10.

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In-Class Exercise:

GDP

1) What's in and what's out?

a) **Hamburger buns bought by McDonald's Corp.**

b) **A used macroeconomics textbook**

c) **A new Chrysler car**

d) **A newly purchased stock**

e) **An antique clock of 18th century**

f) **Steel purchased by GM to make new Chevy volt**

g) **Coca-Cola builds a new plant in the US**

h) **Delta sells one of its airplanes to Korean Air**

i) **Ms. Moneybags buys an existing share of Disney**

j) **An American buys a bottle of French perfume (made in France) in Tulsa, OK**

k) **A Yakima, WA, winery produces Chardonnay and sells it to a customer in Montreal, Canada**

Calculating Gross Domestic Product

GDP can be calculated three ways:

1. **Add up the *value added* of all producers.**
2. **Add up all spending on domestically produced final goods and services.**

This results in the equation $GDP = C + I + G + X - IM$

where *C* = consumer spending,

I **= investment spending,**

G **= government purchases of goods and services,**

X **= sales to foreigners, and**

IM **= imports (purchases here of foreign goods… or income that has leaked across national borders).**

3. **Add up all income paid to factors of production.**

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Value Added

Value added of a producer is the value of its sales minus the value of its purchases of intermediate goods and services.

+ value added =

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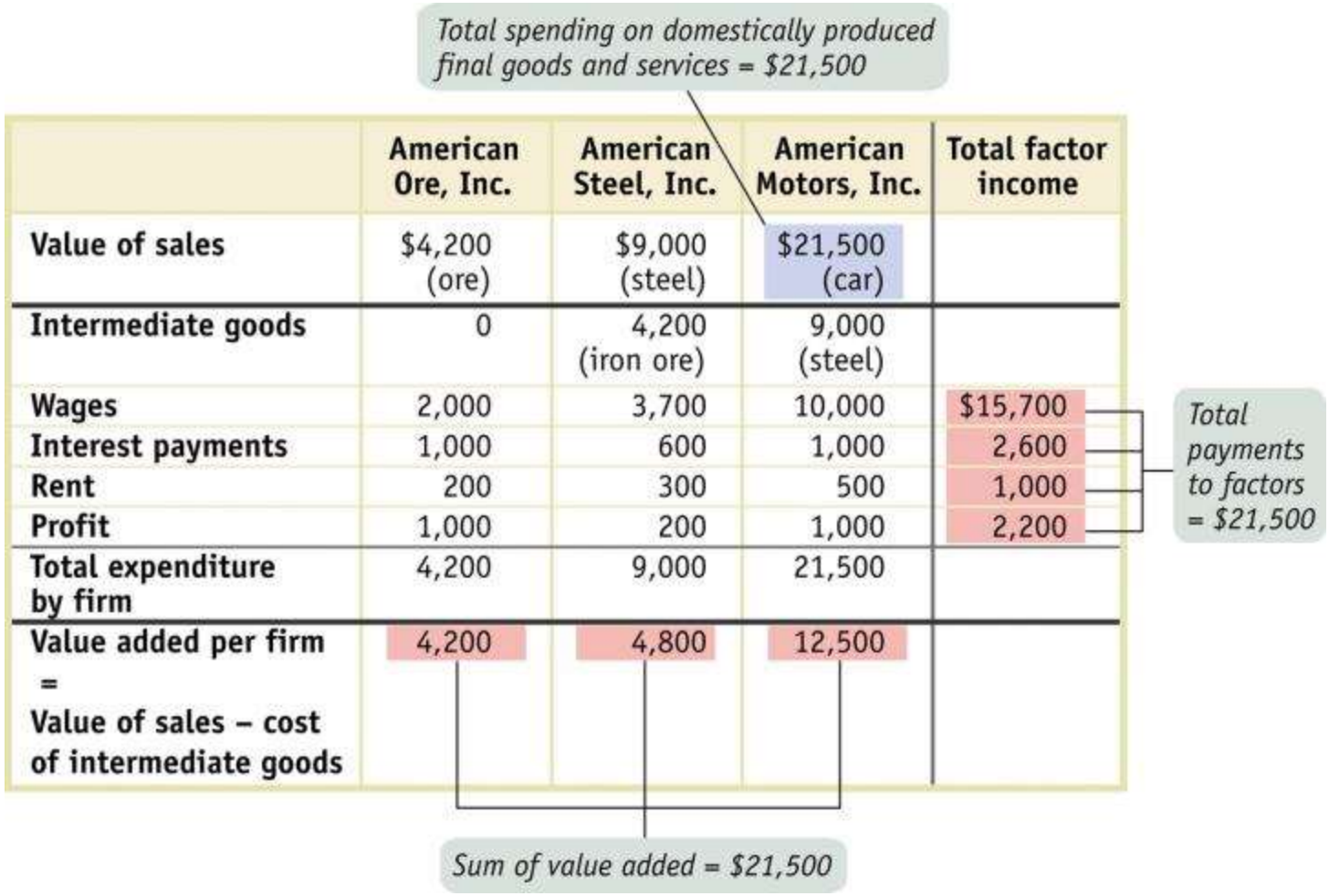
Calculating Gross Domestic Product



	American Ore, Inc.	American Steel, Inc.	American Motors, Inc.	Total factor income
Value of sales	$4,200 (ore)	$9,000 (steel)	$21,500 (car)	
Intermediate goods	0	4,200 (iron ore)	9,000 (steel)	
Wages	2,000	3,700	10,000	$15,700
Interest payments	1,000	600	1,000	2,600
Rent	200	300	500	1,000
Profit	1,000	200	1,000	2,200
Total expenditure by firm	4,200	9,000	21,500	
Value added per firm = Value of sales – cost of intermediate goods	4,200	4,800	12,500	

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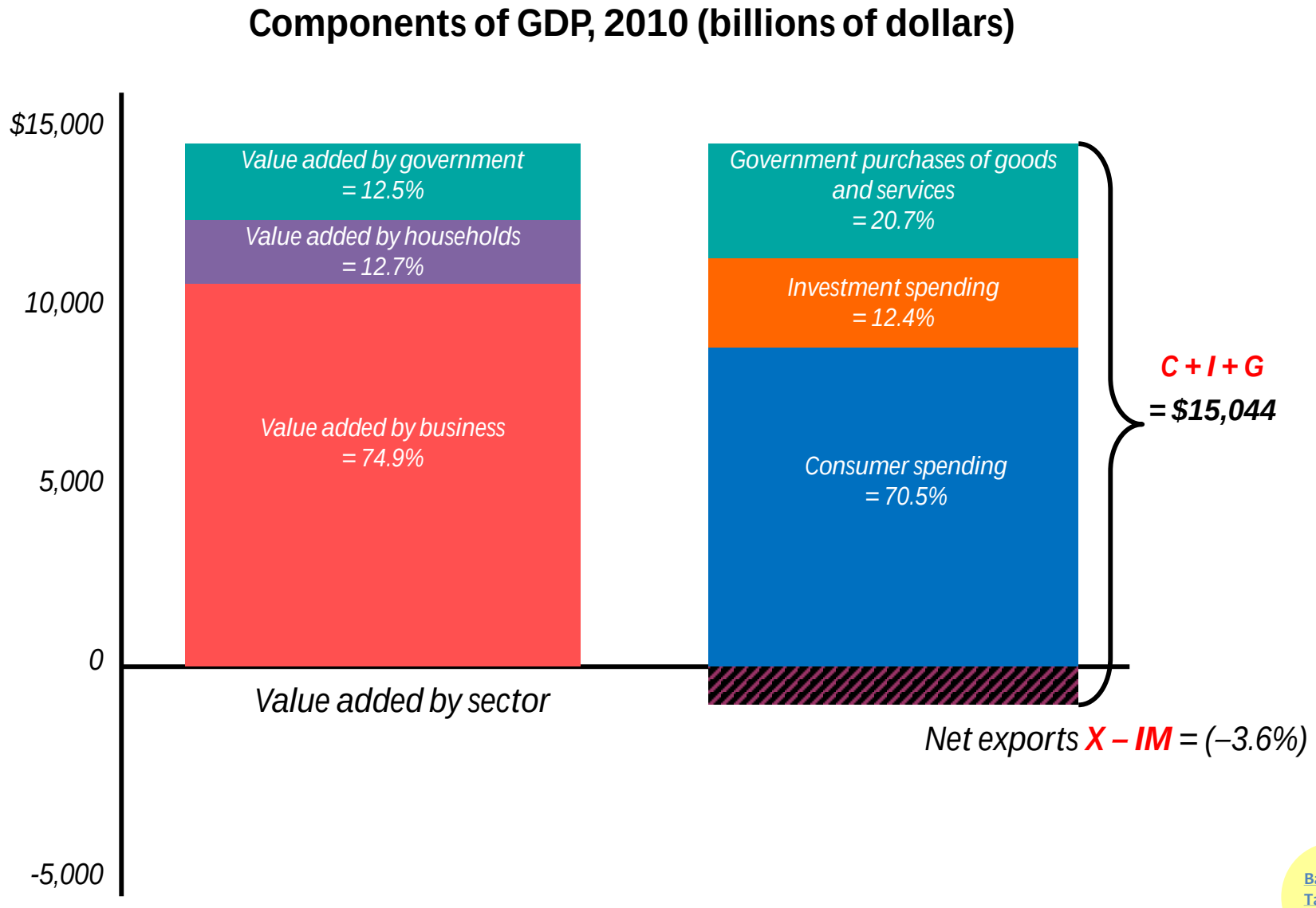
Value Added vs. Spending Method



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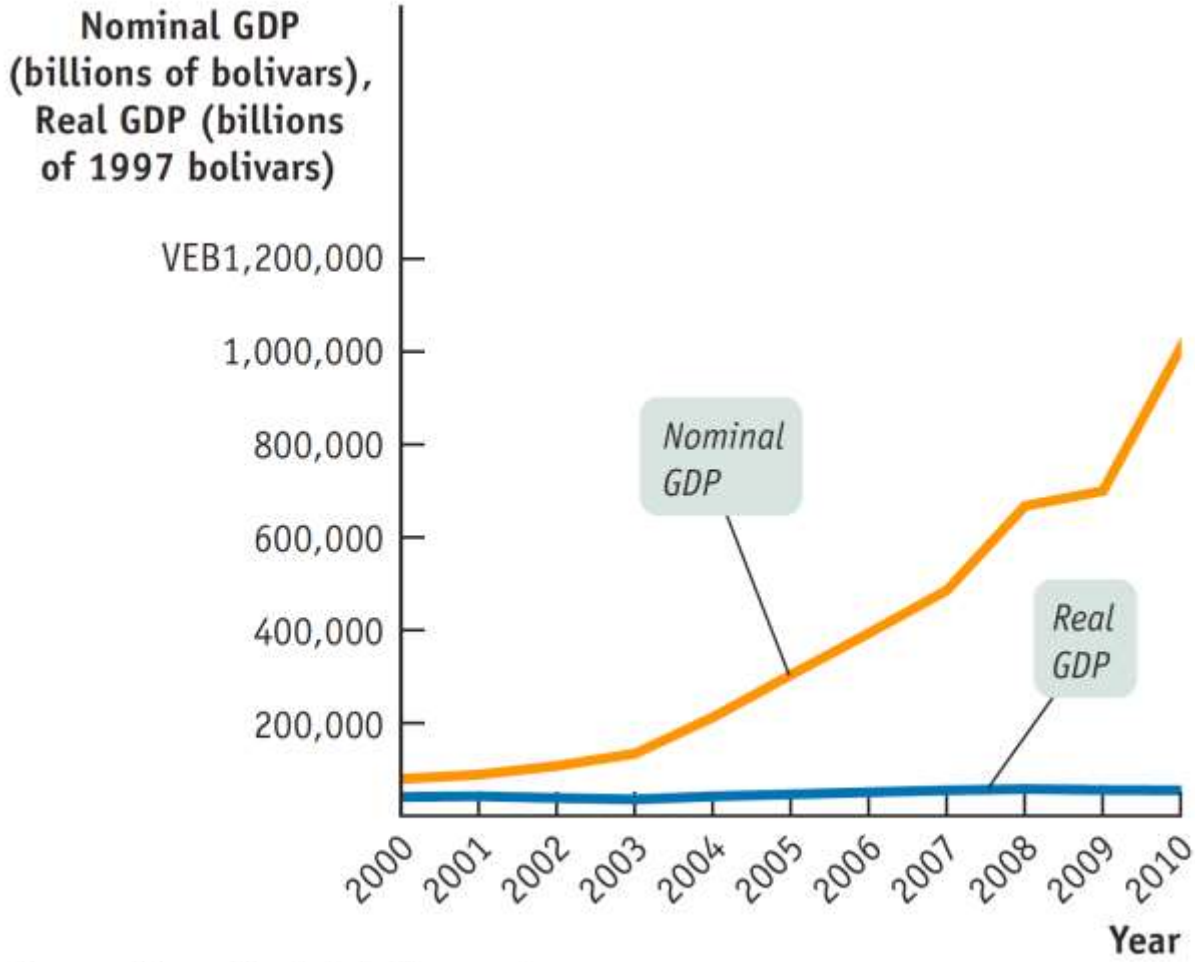
Miracle in Venezuela?

No, it's just suffering from unusually high inflation.



Source: Banco Central de Venezuela.

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Real GDP: A Measure of Aggregate Output

We need to be able track the quantity of total output over time.

Real GDP: the total value of the final goods and services produced in the economy during a given year, **calculated using the prices of a selected base year.**

Nominal GDP: the value of all final goods and services produced in the economy during a given year, **calculated using the prices current in the year in which the output is produced.**

Real GDP per capita: the real GDP divide by number of population

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Real GDP vs. Nominal GDP

Calculating GDP and real GDP in a simple economy:
how much would GDP have gone up if prices had *not* changed?
To answer this question, we need to find the **value of output in year 2 expressed in year 1 prices.**

	Year 1	Year 2
Quantity of apples (billions)	2,000	2,200
Price of apple	$0.25	$0.30
Quantity of oranges (billions)	1,000	1,200
Price of orange	$0.50	$0.70
GDP (billions of dollars)	$1,000	$1,500
Real GDP (billions of year 1 dollars)	$1,000	$1,150

The Growth of Nominal GDP: (1500 – 1000) / 1000 = + 50%

The Growth of Real GDP : (1150 – 1000) / 1000 = + 15%
(if Prices had stayed the same, i.e. No Inflation)

It implies there is an Inflation.

Another way of calculating Inflation: using **GDP Deflator (is NOT "Deflation")**

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GDP Deflator

	Nominal GDP (billions of current dollars)	Real GDP (billions of 2005 dollars)
1995	$7,415	$9,086
2005	12,623	12,623
2010	14,527	13,088

GDP Deflator = 100 x (nominal GDP/real GDP)

1995 = 81.61
2005 = 100.00
2010 = 110.99

Inflation calculated using GDP Deflator to represent P (Price Level): (P2 – P1) / P1
Inflation between 2005 and 2010: 10.99%
Inflation between 1995 and 2005: 23.45%

If we take Log of this equation: GDP Deflator (P) = 100 x (Nominal GDP/Real GDP)

%growth of P (=Inflation) = %growth of NGDP - %growth of RGDP

Between 2005-2010:
Growth of NGDP: ….. %
Growth of RGDP: …..%
The inflation rate is: …..%

Between 1995-2005:
Growth of NGDP: …%
Growth of RGDP: …%
The inflation rate is: …..%

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Active Learning: Practice

	Year 2010	Year 2011	Year 2012
Quantity of tractors	5	5	5
Price of tractors	$10,000	$12,000	$15,000
Quantity of pizzas	100	80	100
Price of pizzas	$10	$20	$20

a) Calculate the Nominal GDP in 2010

b) Calculate the Nominal GDP in 2011

c) Calculate the Nominal GDP in 2012

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Active Learning: Practice

	Year 2010	Year 2011	Year 2012
Quantity of tractors	5	5	5
Price of tractors	$10,000	$12,000	$15,000
Quantity of pizzas	100	80	100
Price of pizzas	$10	$20	$20

Suppose the base year is 2010.

Calculate the Real GDP in 2011 using 2010 as the base year.

Which one of the following is correct?

a) It is greater than nominal GDP in 2011.

b) It is less than nominal GDP in 2011.

c) It is equal to nominal GDP in 2011.

d) It may be greater than, less than, or equal to nominal GDP in 2011.

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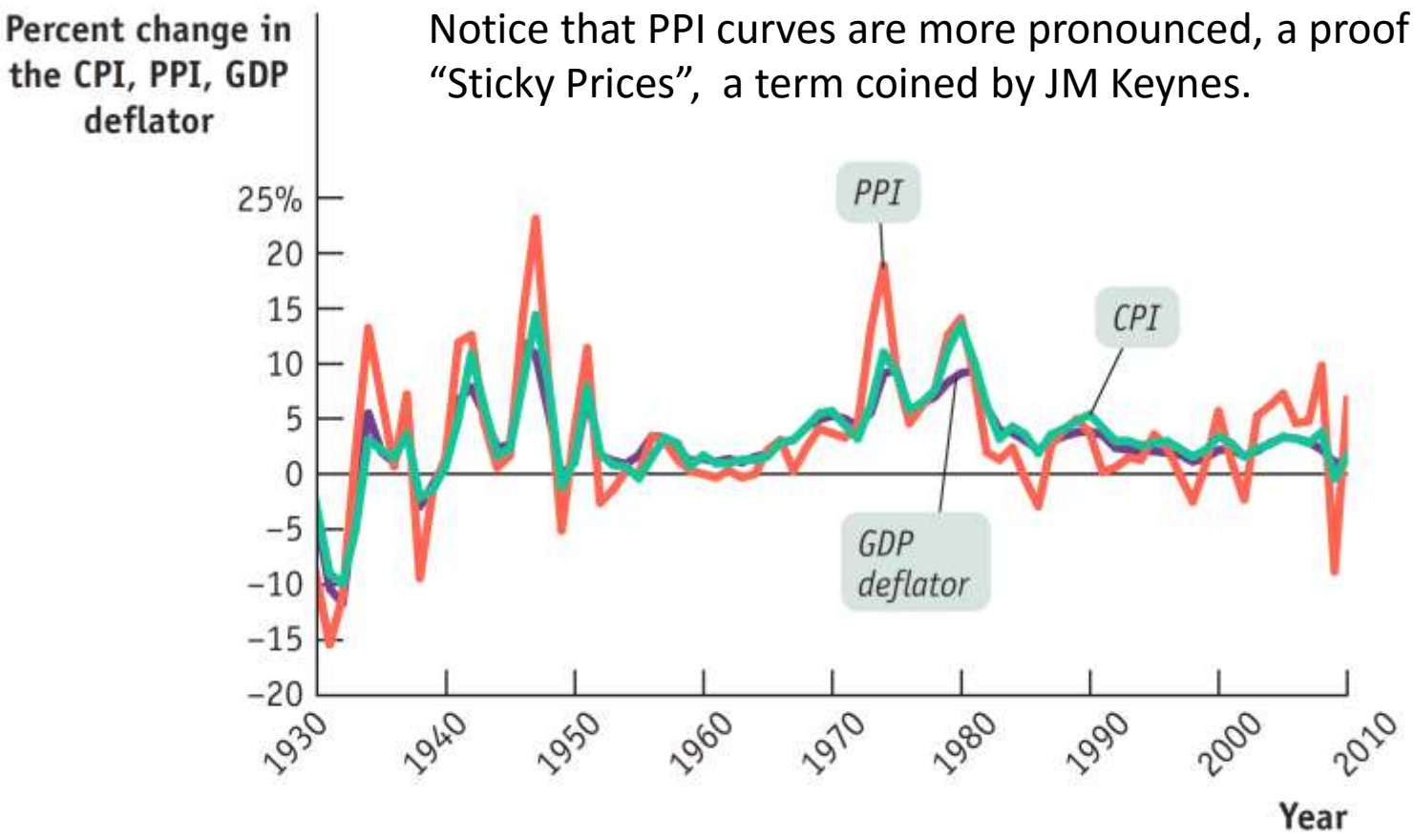
Measuring INFLATION:
CPI, the PPI, and the GDP Deflator

The three measures usually move closely together.

Inflation rate is the percent change of either CPI, PPI, or GDP Deflator

Notice that PPI curves are more pronounced, a proof of "Sticky Prices", a term coined by JM Keynes.



Source: Bureau of Labor Statistics.

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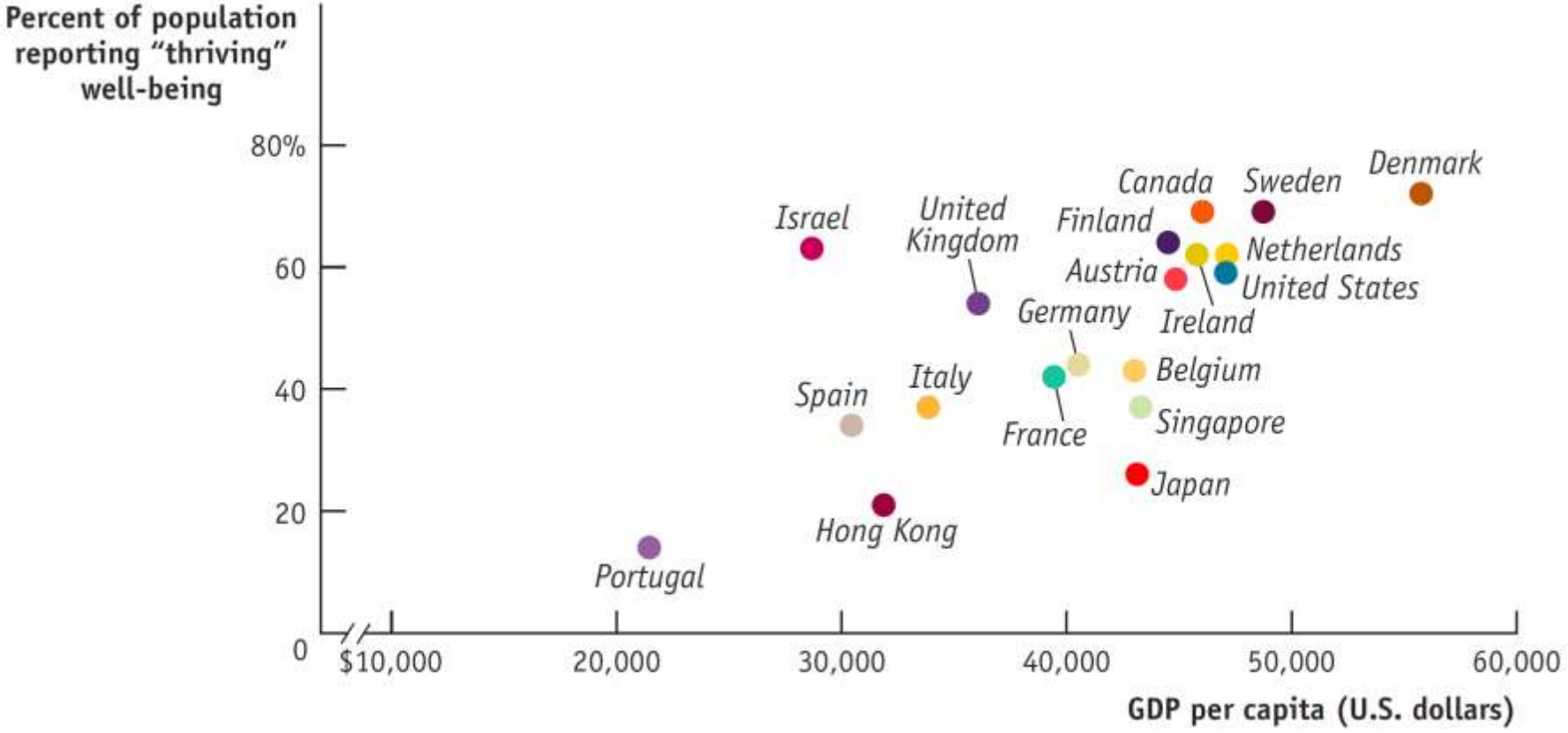
GDP and the Meaning of Life

Rich is better. But….

Money matters less as you grow richer.

Money isn't everything.



Source: Gallup; World Bank.

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