

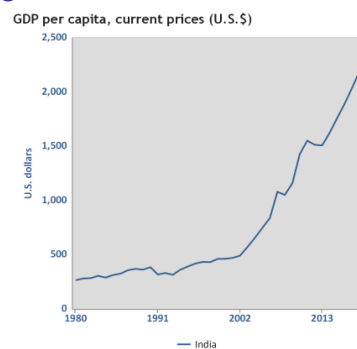
# Principles of Macroeconomics

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## Measuring Progress Matters



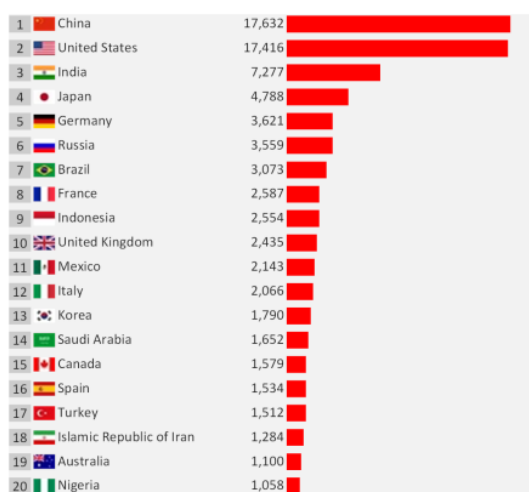
Source: IMF World Economic Outlook, October 2014

80% of India's population live on less than \$2 a day, but > 100m Indians live at an American/European standard of living. India's economy is growing rapidly.

See also: <http://conversableeconomist.blogspot.de/2012/01/indias-economic-growth-puzzles-issues.html>

## GDP Around the World: Top 20 (2014)

GDP based on PPP valuation  
Current international dollar (Billions)



## Growth

- ▶ Economists measure growth as changes in real gross domestic product (**GDP**), the market value of final goods and services produced in an economy, stated in the prices of a given year
- ▶ **Per capita real output** is real GDP divided by the total population; even if total output is increasing, the population may be growing even faster, so per capita real output may fall

	Growth Rates		Income Levels (in 1990 int'l \$)		
	1820-1950	1950-2009	1820	1950	2007
The world	0.9	2.1	\$675	\$2,108	\$7,300
W. Europe	1.1	2.6	1,202	4,578	21,200
N. America	1.6	2.0	1,253	9,463	31,000
Japan	0.8	4.8	660	1,921	22,500
E. Europe	1.1	2.2	683	2,111	7,600
Former USSR	1.8	1.5	700	2,600	6,800
Latin America	1.0	1.6	691	2,503	6,500
China	-0.2	4.4	600	448	6,050
East Asia	0.3	3.5	500	668	5,300
Africa	0.6	1.1	420	1,307	1,700

## Comparing GDP Among Countries

- ▶ Per capita GDP can be used to compare relative standards of living among various countries
- ▶ Because of differences in non-market activities and difference in product prices, per capita GDP may be a misleading measure of living standards
- ▶ Purchasing power parity adjusts for relative price differences before making comparisons

## GDP per Capita Around the World: Top 15 (2013)

GDP per capita based on PPP  
current international \$

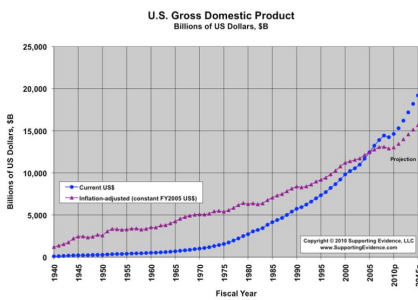


## The Benefits and Costs of Growth

Looking back over the last 10,000 years of human history, which is more “normal”:  
For GDP per capita to grow or for GDP per capita to stay about the same?

- ▶ Per capita economic growth allows everyone in society, on average, to have more
- ▶ Growth, or the prediction of growth, allows governments to avoid hard questions
- ▶ Growth comes with costs:
  - ▶ Pollution
  - ▶ Resource exhaustion
  - ▶ Destruction of natural habitat

## Economic Welfare Over Time



- ▶ Using GDP to compare the economy's performance over time is much better than relying on perceptions
- ▶ GDP figures are affected by inflation
  - ▶ If increases in GDP are due to increases in prices, then welfare does not increase

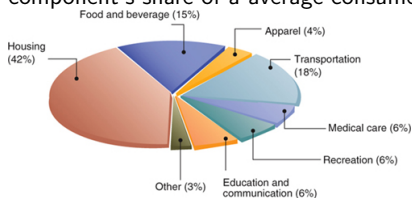
- ▶ Changes in welfare over time are best indicated by changes in real GDP, nominal GDP adjusted for inflation

## Inflation

- ▶ **Inflation** is a continual rise in the price level
- ▶ **Deflation** is a continual fall in the price level
- ▶ Inflation and deflation are measured with changes in price indexes
- ▶ **Price index** is a number that summarizes what happens to a weighted composite of prices of a selection of goods over time

## Real World Price Indexes

- ▶ **GDP deflator** is an index of the price level of aggregate output relative to a base year
- ▶ **Consumer price index (CPI)** measures the prices of a fixed basket of consumer goods, weighted according to each component's share of a average consumer's expenditures



- ▶ **Personal consumption expenditure (PCE) deflator** is a measure of prices of goods that consumers buy that allows yearly changes in the basket of goods that reflect actual consumer purchasing habits
- ▶ **Producer price index (PPI)** measures average change in the selling prices received by domestic producers

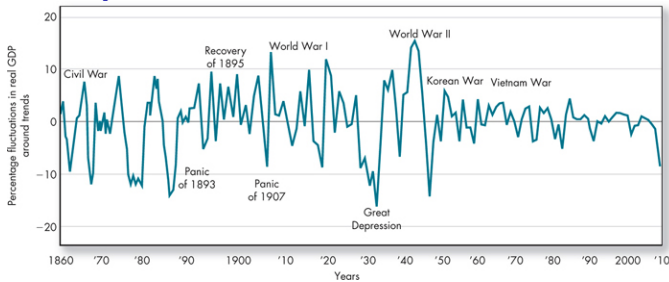
## Real and Nominal Concepts

- ▶ Nominal GDP is the total amount of goods and services produced, measured at current prices
- ▶ Real GDP is the total amount of goods and services produced, adjusted for price level changes

$$\text{Real Output} = \frac{\text{Nominal Output} \times 100}{\text{Price Index}}$$

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

# Business Cycles



- ▶ Sometimes GDP grows above the trend; at other times GDP falls below the trend
- ▶ A business cycle is the upward or downward movement of economic activity, or real GDP, that occurs around the growth trend
- ▶ Economists debate the causes of business cycles
  - ▶ Keynesians generally favor activist government policies
  - ▶ Classicals generally favor laissez-faire policies

# Aggregate Accounting

- ▶ **Aggregate accounting** (or national income accounting) is a set of rules and definitions for measuring economic activity in the aggregate economy – that is, in the economy as a whole
- ▶ Aggregate accounting is a way of measuring total, or aggregate production
- ▶ **Gross domestic product (GDP)** is the total value of all final goods and services produced in an economy in a one year period
- ▶ Calculating GDP requires adding together millions of different services and products
  - ▶ All of the quantities of goods and services produced are multiplied by their market price per unit to determine a value measure of the good or service
  - ▶ This is weighting the importance of each good by its price
  - ▶ The sum of all of these values is GDP

# The Phases of the Business Cycle

The four phases of the business cycle are:

- ▶ The peak
- ▶ The downturn
- ▶ The trough
- ▶ The upturn



- ▶ A **recession** is a decline in real output that persists for more than two consecutive quarters of a year
- ▶ A **depression** is a large recession
- ▶ An **expansion** is an upturn that lasts at least two consecutive quarters of a year
- ▶ Why business cycles occur remains a controversy...

# The Components of GDP

GDP is divided into four expenditure categories:

1. **Consumption (C)** is spending by households on goods and services
  2. **Investment (I)** is spending for the purpose of additional production
  3. **Government spending (G)** is goods and services that the government buys
  4. **Net exports (NX)** is spending on exports (X) minus spending on imports (M)
- ▶ Since all production is categorized into one of these four divisions, by adding up these four categories, we get total production of U.S. goods and services
- GDP = Consumption + Investment + Government spending + Net exports

$$GDP = C + I + G + (X - M)$$

# Expenditure Breakdown of GDP Country

Country	GDP (billions \$)	= C (%)	+ I (%)	+ G (%)	+ X (%)	- I (%)
U.S.	\$14,265	71	14	20	13	-20
Belgium	376	51	23	23	89	-86
Czech Republic	248	47	38	20	70	-75
Germany	2,928	55	18	18	47	-41
Japan	4,294	55	25	18	18	-16
Mexico	1,480	66	26	10	28	-30
Poland	609	60	26	18	41	-45

What is the difference between a nation's wealth and its GDP? How are the two related?

## GDP is a Flow Concept

- ▶ GDP is a flow concept, the amount of total final output a country produces per year
  - ▶ **Wealth accounts** is a balance sheet of an economy's assets and liabilities and it is a stock concept
  - ▶ **Real wealth** is the value of the productive capacity of the assets of an economy measured by the goods and services it can produce now and in the future
  - ▶ **Nominal wealth** is the value of those assets measured at current market prices
- ▶ Wealth is a nation's stock of useful goods and resources at a given point in time. GDP is the flow of goods and services and thus is the annual addition to this stock.

## GDP Measures Final Output

- ▶ GDP does not measure total transactions in the economy
- ▶ It counts final output, but not intermediate goods
- ▶ Final output is goods and services purchased for final use
- ▶ Intermediate products are used as an input in the production of some other product
- ▶ Counting the sale of both final and intermediate goods would result in double counting

## Two Ways of Eliminating Double Counting

- ▶ Calculate only final output
  - ▶ A firm would report how much it sold to consumers and how much it sold to producers (intermediate goods)
- ▶ Follow the value added approach
  - ▶ Value added is the increase in value that a firm contributes to a product or service
  - ▶ It is calculated by subtracting intermediate goods (the cost of materials that a firm uses to produce a good or service) from the value of its sales
  - ▶ Example: Ice cream production

Participants	Cost of Materials (\$)	Value of Sales (\$)	Value Added (\$)
Farmer	0	100	100
Cone factory and ice cream maker	100	250	150
Middleperson (final sales)	250	400	150
Vendor	400	500	100
<b>Totals</b>	<b>750</b>	<b>1,250</b>	<b>500</b>

## What is Counted in GDP?

### Not Counted

- ▶ Value of resale goods
- ▶ Sales of stocks or bonds
- ▶ Government transfer payments
- ▶ Work of house-spouses

### Counted

- ▶ Value added by a used car dealer
- ▶ Commissions paid to stock brokers

## Gross and Net Concepts

- ▶ Net domestic product is GDP adjusted for depreciation,
  - ▶ Depreciation is the amount of capital used up in producing that year's GDP
  - ▶ NDP measures output available for purchase
- $$NDP = C + I + G + (X - M) - \text{depreciation}$$
- ▶ Net Investment is gross investment minus depreciation

## National and Domestic Concepts

- ▶ GDP is the total value of all final goods and services produced in an economy in a one-year period
- ▶ GDP is output produced within a country's borders
- ▶ Gross National Product (GNP) is the aggregate final output of citizens and businesses of an economy in one year
- ▶ GNP is output produced by a country's citizens
- ▶  $GNP = GDP + \text{Net foreign factor income}$
- ▶ Net foreign factor income is the income from foreign domestic factor sources minus foreign factor income earned domestically

# The Income Approach

- ▶ Aggregate income is the total income earned by citizens and businesses in a country in a year
  - ▶ Aggregate income consists of:
    - ▶ Employee compensation
    - ▶ Rent
    - ▶ Interest
    - ▶ Profits
- ▶ Aggregate income =  
Employee compensation + Rents + Interest + Profits

Consider the following two claims. The first would be a typical statement at the magazine The Nation, while the second would be a typical statement at the magazine National Review:

Europeans have strong labor unions, so their workers get a bigger share of the pie than American workers.

Since European businesses are highly regulated, they have little incentive to make big profits. Therefore, they get a much smaller share of national product than American workers.

It is true that Europeans have stronger labor unions than Americans, and it is true that European businesses face higher regulatory burdens than American businesses. But with that in mind, what is wrong with these two statements? What fact are they ignoring? And what does that fact tell us about what strong unions and high levels of government regulation can't do?

# Aggregate Income Breakdown

Country	Aggregate Income (billions)	= Employee compensation	+ Rents	+ Interest	+ Profits
U.S.	\$14,129	71%	1%	6%	22%
Japan	\$4,294	73%	2%	2%	23%
Germany	\$2,928	73%	2%	6%	19%
U.K.	\$2,213	62%	4%	3%	30%
Canada	\$1,270	68%	8%	6%	18%
Sweden	\$341	64%	4%	13%	19%

# Equality of Income and Expenditures

- ▶ Whenever a good or service is produced (output), somebody receives an income for producing it

$$\text{Aggregate Income} \equiv \text{Aggregate Production}$$

- ▶ Profit is a residual that makes the income side equal the expenditures side
- ▶ This aggregate identity allows us to calculate GDP either by adding up all values of final outputs (C, I, G, NX) or by adding up the values of all earnings or income