MACRO ECONOMICS
What is Macroeconomics?

Macroeconomics is the study of the large economy as a whole. It is the study of the big picture.

- Instead of analyzing one consumer, we analyze everyone.
- Instead of one business we study all businesses.

Why study the whole economy?

- The field of macroeconomics was born during the Great Depression.
- Government didn’t understand how to fix a depressed economy with 25% unemployment.
- Macro was created to:
  1. Measure the health of the whole economy.
  2. Guide government policies to fix problems.
Unit 2: Macro Measures and International Trade
For all countries there are three major economic goals:

1. Promote Economic Growth
2. Limit Unemployment
3. Keep Prices Stable (Limit Inflation)

In this unit we will analyze how each of these are measured.
Goal #1
Promote Economic Growth

How does a country measure economic growth?
How do we know how well the economy is doing?

- Economists collect statistics on production, income, investment, and savings.
- This is called national income accounting.

The most important measure of growth is **GDP**.

Gross Domestic Product (GDP) is the **dollar value** of all **final goods and services** produced within a country’s borders in **one year**.

- **Dollar value**- GDP is measured in dollars.
- **Final Goods**- GDP does not include the value of intermediate goods. Intermediate goods are goods used in the production of final goods and services.
- **One Year**- GDP measures annual economic performance.
What does GDP tell us?

Just like calculating your own income, GDP measures how well the U.S. is doing financially.

How do you use GDP?

1. Compare to previous years (Is there growth?)
2. Compare policy changes (Did a new policy work?)
3. Compare to other countries (Are we better off?)

<table>
<thead>
<tr>
<th>#</th>
<th>Country</th>
<th>GDP (2007)</th>
</tr>
</thead>
<tbody>
<tr>
<td>217</td>
<td>Cook Islands</td>
<td>$183,200,000</td>
</tr>
<tr>
<td>218</td>
<td>Tonga</td>
<td>$178,500,000</td>
</tr>
<tr>
<td>219</td>
<td>Palau</td>
<td>$124,500,000</td>
</tr>
<tr>
<td>220</td>
<td>Marshall Islands</td>
<td>$115,000,000</td>
</tr>
<tr>
<td>221</td>
<td>Anguilla</td>
<td>$108,900,000</td>
</tr>
<tr>
<td>222</td>
<td>Falkland Islands (Islas Malvinas)</td>
<td>$75,000,000</td>
</tr>
<tr>
<td>223</td>
<td>Nauru</td>
<td>$60,000,000</td>
</tr>
<tr>
<td>224</td>
<td>Wallis and Futuna</td>
<td>$60,000,000</td>
</tr>
<tr>
<td>225</td>
<td>Saint Pierre and Miquelon</td>
<td>$48,300,000</td>
</tr>
<tr>
<td>226</td>
<td>Montserrat</td>
<td>$29,000,000</td>
</tr>
<tr>
<td>227</td>
<td>Saint Helena</td>
<td>$18,000,000</td>
</tr>
<tr>
<td>228</td>
<td>Tuvalu</td>
<td>$14,940,000</td>
</tr>
</tbody>
</table>

*CIA 2007 Estimate*
How can you measure growth from year to year?

\[
\text{% Change in GDP} = \frac{\text{Year 2} - \text{Year 1}}{\text{Year 1}} \times 100
\]

Mordor’s GDP in 2007 was $4000
Mordor’s GDP in 2008 was $5000
What is the % Change in GDP?

Transylvania’s GDP in 2007 was $2,000
Transylvania’s GDP in 2008 was $2,100
What is the % Change in GDP?
What is NOT included in GDP?

1. Intermediate Goods
   - No Multiple Counting, Only Final Goods
     - EX: Price of finished car, not the radio, tire, etc.

2. Nonproduction Transactions
   - Financial Transactions (nothing produced)
     - Ex: Stocks, bonds, Real estate
   - Used Goods
     - Ex: Old cars, used clothes

3. Non-Market (Illegal) Activities
   - Ex: Illegal drugs, unpaid work
Calculating GDP

Two Ways of calculating GDP:

1. Expenditures Approach - Add up all the spending on final goods and services produced in a given year.

2. Income Approach - Add up all the income that resulted from selling all final goods and services produced in a given year.

Both ways generate the same amount since every dollar spent is a dollar of income.
Expenditures Approach

Four components of GDP:

1. Consumer Spending
   Ex: $5 Little Caesar's Pizza

2. Investments - When businesses put money back into their own business.
   Ex: Machinery or tools

3. Government Spending
   Ex: Bombs or tanks, NOT social security

4. Net Exports - Exports ($X$) – Imports ($M$)
   Ex: Value of 3 Ford Focuses minus 2 Hondas

\[ \text{GDP} = C + I + G + X_n \]
Calculating GDP
Included or not Included in GDP?

For each situation, identify if it is included in GDP and identify the category C, I, G, or X_n

1. $10.00 for movie tickets
2. $5M Increase in defense expenditures
3. $45 for used economics textbook
4. Ford makes new $2M factory
5. $20K Toyota made in Mexico
6. $10K Profit from selling stocks
7. $15K car made in US, sold in Canada
8. $10K Tuition to attend college
9. $120 Social Security payment to Bob
10. Farmer purchases new $100K tractor
Included or not Included in GDP?

GDP=$7,125,010

1. $10.00 for movie tickets
2. $5M Increase in defense expenditures
   X $45 for used economics textbook
4. Ford makes new $2M factory
   X $20K Toyota made in Mexico
   X $10K Profit from selling stocks
7. $15K car made in US, sold in Canada
8. $10K Tuition to attend college
   X $120 Social Security payment to Bob
10. Farmer purchases new $100K tractor
Nominal GDP vs. Real GDP
How can you figure out which is the most popular movie of all time?

What is the problem with this method?

Nominal Box Office Receipts

<table>
<thead>
<tr>
<th>Rank</th>
<th>Title</th>
<th>Studio</th>
<th>Lifetime Gross</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Avatar</td>
<td>20th Century Fox</td>
<td>$749,710,176</td>
</tr>
<tr>
<td>2</td>
<td>Titanic</td>
<td>Paramount Pictures</td>
<td>$600,788,188</td>
</tr>
<tr>
<td>3</td>
<td>The Dark Knight</td>
<td>Warner Bros.</td>
<td>$533,345,358</td>
</tr>
<tr>
<td>4</td>
<td>Star Wars Episode IV: A New Hope</td>
<td>20th Century Fox</td>
<td>$460,998,007</td>
</tr>
<tr>
<td>5</td>
<td>Shrek 2</td>
<td>DreamWorks</td>
<td>$441,226,247</td>
</tr>
<tr>
<td>6</td>
<td>E.T. the Extra-Terrestrial</td>
<td>Universal Pictures</td>
<td>$435,110,554</td>
</tr>
<tr>
<td>7</td>
<td>Star Wars Episode I: The Phantom Menace</td>
<td>20th Century Fox</td>
<td>$431,088,301</td>
</tr>
<tr>
<td>8</td>
<td>Pirates of the Caribbean: Dead Man's Chest</td>
<td>Walt Disney Pictures</td>
<td>$423,315,812</td>
</tr>
<tr>
<td>9</td>
<td>Spider-Man</td>
<td>Columbia Pictures</td>
<td>$403,706,375</td>
</tr>
<tr>
<td>10</td>
<td>Transformers: Revenge of the Fallen</td>
<td>Paramount Pictures/DreamWorks</td>
<td>$402,111,870</td>
</tr>
<tr>
<td>11</td>
<td>Star Wars Episode III: Revenge of the Sith</td>
<td>20th Century Fox</td>
<td>$380,270,577</td>
</tr>
<tr>
<td>12</td>
<td>Toy Story 3</td>
<td>Walt Disney Pictures</td>
<td>$379,529,000</td>
</tr>
<tr>
<td>13</td>
<td>The Lord of the Rings: The Return of the King</td>
<td>New Line Cinema</td>
<td>$377,027,325</td>
</tr>
<tr>
<td>14</td>
<td>Spider-Man 2</td>
<td>Columbia Pictures</td>
<td>$373,585,825</td>
</tr>
<tr>
<td>15</td>
<td>The Passion of the Christ</td>
<td>Newmarket Films</td>
<td>$370,782,930</td>
</tr>
</tbody>
</table>
How can you figure out which is the most popular movie of all time?

**Real Box Office Receipts (adjusted for inflation)**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Title</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gone With The Wind</td>
<td>1939</td>
</tr>
<tr>
<td>2</td>
<td>Star Wars</td>
<td>1977</td>
</tr>
<tr>
<td>3</td>
<td>The Sound of Music</td>
<td>1965</td>
</tr>
<tr>
<td>4</td>
<td>E.T. the Extra-Terrestrial</td>
<td>1982</td>
</tr>
<tr>
<td>5</td>
<td>The Ten Commandments</td>
<td>1956</td>
</tr>
<tr>
<td>6</td>
<td>Titanic</td>
<td>1997</td>
</tr>
<tr>
<td>7</td>
<td>Jaws</td>
<td>1975</td>
</tr>
<tr>
<td>8</td>
<td>Doctor Zhivago</td>
<td>1965</td>
</tr>
<tr>
<td>9</td>
<td>The Exorcist</td>
<td>1973</td>
</tr>
<tr>
<td>10</td>
<td>Snow White and the Seven Dwarfs</td>
<td>1937</td>
</tr>
<tr>
<td>11</td>
<td>One Hundred and One Dalmatians</td>
<td>1961</td>
</tr>
<tr>
<td>12</td>
<td>Star Wars Episode V: The Empire Strikes Back</td>
<td>1980</td>
</tr>
<tr>
<td>13</td>
<td>Ben-Hur</td>
<td>1959</td>
</tr>
<tr>
<td>14</td>
<td>Avatar</td>
<td>2009</td>
</tr>
<tr>
<td>15</td>
<td>Star Wars Episode VI: Return of the Jedi</td>
<td>1983</td>
</tr>
<tr>
<td>16</td>
<td>The Sting</td>
<td>1973</td>
</tr>
<tr>
<td>17</td>
<td>Raiders of the Lost Ark</td>
<td>1981</td>
</tr>
<tr>
<td>18</td>
<td>Jurassic Park</td>
<td>1993</td>
</tr>
<tr>
<td>19</td>
<td>The Graduate</td>
<td>1967</td>
</tr>
</tbody>
</table>
The Problem with GDP

If a country’s GDP increased from $4 Billion to $5 Billion in one year, is the country experiencing economic growth?

Did the country definitely produce 25% more products?

What is Inflation?
• A rising general level of prices

EX: If apples are the only thing being produced

Year 1: 10 apples at $1 each; GDP = $10
Year 2: 10 apples x $1.25; GDP = $12.50

GDP is rising, but country is worse off!
Real vs. Nominal GDP

Nominal GDP is GDP measured in current prices. It does not account for inflation from year to year.

Real GDP is GDP expressed in constant, or unchanging, dollars.

Real GDP adjusts for inflation.

REAL GDP IS THE BEST MEASURE OF ECONOMIC GROWTH!
Real vs. Nominal GDP Example

2008
10 cars at $15,000 each = $150,000
10 trucks at $20,000 each = $200,000
Nominal GDP = $350,000

2009
10 cars at $16,000 each = $160,000
10 trucks at $21,000 each = $210,000
Nominal GDP = $370,000

The GDP in year 20048 shows the dollar value of all final goods produced.

The nominal GDP in year 2009 is higher which suggests that the economy is improving.

But how much is the REAL GDP? How do you get it?

Use 2008 Prices.

The Real GDP for 2009 is the same as 2008 after we adjust for inflation.
Real GDP “deflates” nominal GDP by adjusting for inflation in terms of a base year prices.
Does GDP accurately measure standard of living?

Standard of living (or quality of life) can be measured, in part, by how well the economy is doing...

But it needs to be adjusted to reflect the size of the nation’s population.

Real GDP per capita (per person)

- Real GDP per capita is real GDP divided by the total population. It identifies on average how many products each person makes.

  Real GDP per capita is the best measure of a nation’s standard of living.
List the top 5 most populated countries

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>World</td>
<td>6,602,224,175</td>
</tr>
<tr>
<td>2</td>
<td>China</td>
<td>1,321,851,888</td>
</tr>
<tr>
<td>3</td>
<td>India</td>
<td>1,129,866,154</td>
</tr>
<tr>
<td>4</td>
<td>European Union</td>
<td>490,426,060</td>
</tr>
<tr>
<td>5</td>
<td>United States</td>
<td>301,139,947</td>
</tr>
<tr>
<td>6</td>
<td>Indonesia</td>
<td>234,693,997</td>
</tr>
<tr>
<td>7</td>
<td>Brazil</td>
<td>190,010,647</td>
</tr>
<tr>
<td>8</td>
<td>Pakistan</td>
<td>164,741,924</td>
</tr>
<tr>
<td>9</td>
<td>Bangladesh</td>
<td>150,448,339</td>
</tr>
<tr>
<td>10</td>
<td>Russia</td>
<td>141,377,752</td>
</tr>
</tbody>
</table>
# GDP Per Capita

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>GDP - per capita (PPP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Luxembourg</td>
<td>$ 80,800</td>
</tr>
<tr>
<td>2</td>
<td>Qatar</td>
<td>$ 75,900</td>
</tr>
<tr>
<td>3</td>
<td>Bermuda</td>
<td>$ 69,900</td>
</tr>
<tr>
<td>4</td>
<td>Jersey</td>
<td>$ 57,000</td>
</tr>
<tr>
<td>5</td>
<td>Norway</td>
<td>$ 55,600</td>
</tr>
<tr>
<td>6</td>
<td>Kuwait</td>
<td>$ 55,300</td>
</tr>
<tr>
<td>7</td>
<td>United Arab Emirates</td>
<td>$ 55,200</td>
</tr>
<tr>
<td>8</td>
<td>Singapore</td>
<td>$ 48,900</td>
</tr>
<tr>
<td>9</td>
<td>United States</td>
<td>$ 46,000</td>
</tr>
<tr>
<td>10</td>
<td>Ireland</td>
<td>$ 45,600</td>
</tr>
<tr>
<td>11</td>
<td>Guernsey</td>
<td>$ 44,600</td>
</tr>
<tr>
<td>12</td>
<td>Equatorial Guinea</td>
<td>$ 44,100</td>
</tr>
<tr>
<td>13</td>
<td>Cayman Islands</td>
<td>$ 43,800</td>
</tr>
</tbody>
</table>
Why do some countries have higher GDPs than others?

Productivity (TECHN)

1. Technology

2. Economic System
   
   Example #1: Capitalist countries have historically had more economic growth.
   
   - Capital (like robots) can produce more than people
   - Countries with more capital, can produce more products than countries without a lot of capital.

3. Capital

   Ex: Capital stock is machinery, tools, and man-made resources.
   
   Example #1: India has over a billion people (human resources) but relatively few capital resources and therefore a lower GDP than the U.S.
   
   Example #2: Japan has few natural resources but a high GDP

4. Human Capital (Knowledge)

5. Natural Resources

   Ex: Syria has a lower GDP because it is mostly desert.
THE BUSINESS CYCLE
THE BUSINESS CYCLE
The national economy fluctuates resulting in periods of boom and bust.

A Recession is a 6 month period of decline in output, income, employment, and trade. (If really bad... then depression)
The Business Cycle

Why does the economy fluctuate?

• Retailer and Producers send misleading information about consumer demand.
• Advances in tech, productivity, or resources.
• Outside influences (wars, supply shocks, panic).

Who cares?

• Macroeconomics measures these fluctuations and guides policies to keep the economy stable.
• The government has the responsibility to:
  • Promote long-term growth.
  • Prevent unemployment (resulting from a bust).
  • Prevent inflation (resulting from a boom).
Characteristics of Expansions and Recessions

**Expansions**
1. Less unemployment
2. Increase in real GDP
3. Rapid job growth
4. Increasing interest rates
5. Increasing prices
6. Fewer social problems [alcoholism, domestic violence, divorce, and suicides]

**Recessions**
1. More unemployment
2. Decrease in Real GDP
3. Reduced job growth
4. Lower interest rates
5. Decreasing prices
6. More social problems [alcoholism, domestic violence, divorce, and suicides]
Quarter-to-Quarter Growth in Real GDP

Real GDP growth is measured at seasonally adjusted annual rates.
What is Economic Growth?
1. An increase in real GDP over time
2. An increase in real GDP per capita over time (usually used to determine standard of living)

Why is economic growth the goal of every society?
• Provides better goods and services
• Increases wages and standard of living
• Allows more leisure time
• Economy can better meet wants
Goal #2
Limit Unemployment
What is Unemployment?

The Unemployment rate
The percent of people in the labor force who want a job but are not working.

\[
\text{Unemployment rate} = \frac{\# \text{ unemployed}}{\# \text{ in labor force}} \times 100
\]

Who is in the Labor Force?

• Above 16 years old
• Able and willing to work
• Not institutionalized (jails, hospitals)
• Not in military, in school full time, or retired

Why is a stay at home mom not unemployed?
Three Types of Unemployment
3 Types of Unemployment

#1. Frictional Unemployment

- “Temporarily unemployed” or being between jobs.
- Individuals are qualified workers with transferable skills but they aren’t working.

Examples:
- High school or college graduates looking for jobs.
- Individuals that were fired and are looking for a better job.

You’re Fired!
3 Types of Unemployment

Seasonal Unemployment

• This is a specific type of frictional unemployment which is due to time of year and the nature of the job.
• These jobs will come back

Examples:
• Professional Santa Clause Impersonators
• Construction workers in Michigan
#2. Structural Unemployment

- Changes in the structure of the labor force make some skills obsolete.
- Workers **DO NOT** have transferable skills and these jobs will never come back.
- Workers must learn new skills to get a job.
- The permanent loss of these jobs is called “creative destruction.” *(Why?)*

**Examples:**
- VCR repairmen
- Carriage makers
3 Types of Unemployment

Technological Unemployment
• Type of structural unemployment where automation and machinery replace workers causing unemployment

Examples:
• Auto assemblers fired as robots take over production
• Producers of Capital Goods (tractors) fire assemblers
3 Types of Unemployment

#3 Cyclical Unemployment

• Unemployment that results from economic downturns (recessions).

• As demand for goods and services falls, demand for labor falls and workers are fired.

Examples:

• Steel workers laid off during recessions.

• Restaurant owners fire waiters after months of poor sales due to recession.
The Natural Rate an Full Employment

Two of the three types of unemployment are unavoidable:

- Frictional unemployment
- Structural unemployment

Together they make up the natural rate of unemployment (NRU).

We are at full employment if we have only the natural rate of unemployment.

- This is the normal amount of unemployment that we SHOULD have.
  - The number of jobs seekers equals the number of jobs vacancies.
In other words...

**Full employment means NO Cyclical unemployment!**

Economists generally agree that an unemployment rate of around 4 to 6 percent is normal.

4-6% Unemployment = Full Employment

Currently the U.S. is at _______%
California is at _______%
Criticisms of the Unemployment Rate

What is wrong with the unemployment rate?

It can misdiagnose the actual unemployment rate because of the following:

**Discouraged job seekers**-
- Some people are no longer looking for a job because they have given up.

**Part-Time Workers**-
- Someone who wants more shifts but can’t get them is still considered employed.

**Race/Age Inequalities**-
- Hispanics – 5.8% for January
- African American- 8.9% for January
- Teenagers- 15.3% for January

**Illegal Labor**-
- Many people work under the table.
Goal #3

LIMIT INFLATION

Country and Time - Zimbabwe, 2008
Annual Inflation Rate - 79,600,000,000%
Time for Prices to Double - 24.7 hours
What is Inflation?

Inflation is rising general level of prices.

Inflation reduces the “purchasing power” of money.

Examples:

• It takes $2 to buy what $1 bought in 1982.
• It takes $6 to buy what $1 bought in 1961.

• When inflation occurs, each dollar of income will buy fewer goods than before.
How is Inflation measured?
The government tracks the prices of the same goods and services each year.

- This “market basket” is made up of about 300 commonly purchased goods
- The Inflation Rate - % change in prices in 1 year
- They also compare changes in prices to a given base year (usually 1982)
- Prices of subsequent years are then expressed as a percentage of the base year

Examples:
- 2005 inflation rate was 3.4%
- U.S. prices have increased 98.3% since 1982 (base year).
- The inflation rate in Bolivia in 1985 was 50,000%
  - This is called Hyperinflation
  - A $25 meal today would cost $12,525 a year later
World Inflation Rates
Is Inflation Good or Bad?
Identify which people are helped and which are hurt by unanticipated inflation?

1. A man who lent out $500 to his friend in 1960 and is still waiting to be paid back.
2. A tenant who is charged $850 rent each year.
3. An elderly couple living off fixed retirement payments of $2000 a month.
4. A man that borrowed $1,000 in 1995 and paid it back in 2006.
5. A women who saved a paycheck from 1950 by putting it under her mattress.
### Make a T-Chart

<table>
<thead>
<tr>
<th>Hurt by Inflation</th>
<th>Helped by Inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Lenders-People who lend money (at fixed interest rates)</td>
<td>• Debtors-People who borrow money</td>
</tr>
<tr>
<td>• People with fixed incomes</td>
<td>• A business where the price of the product increases faster than the price of resources</td>
</tr>
<tr>
<td>• Savers</td>
<td></td>
</tr>
</tbody>
</table>

### Cost-of-Living-Adjustment (COLA)

Some works have salaries that mirror inflation. They negotiated wages that rise with inflation.
Measuring Inflation

Consumer Price Index (CPI)
Consumer Price Index (CPI)
The most commonly used measurement inflation for consumers is the Consumer Price Index

Here is how it works:
• The base year is given an index of 100
• To compare, each year is given an index # as well

\[
\text{CPI} = \frac{\text{Price of market basket}}{\text{Price of market basket in base year}} \times 100
\]

1997  Market Basket: Movie is $6 & Pizza is $14
Total = $20 (Index of Base Year = 100)

2009  Market Basket: Movie is $8 & Pizza is $17
Total = $25 (Index of 125)

• This means inflation increased 25% b/w ’97 & ‘09
• Items that cost $100 in ’97 cost $125 in ‘09
CPI vs. GDP Deflator

The GDP deflator measures the prices of all goods produced, whereas the CPI measures prices of only the goods and services bought by consumers. An increase in the price of goods bought by firms or the government will show up in the GDP deflator but not in the CPI.

The GDP deflator includes only those goods and services produced domestically. Imported goods are not a part of GDP and therefore don’t show up in the GDP deflator.

\[
\text{GDP Deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100
\]

If the nominal GDP in ’09 was 25 and the real GDP (compared to a base year) was 20 how much is the GDP Deflator?
Problems with the CPI

1. **Substitution Bias**- As prices increase for the fixed market basket, consumers buy less of these products and more substitutes that may not be part of the market basket. *(Result: CPI may be higher than what consumers are really paying)*

2. **New Products**- The CPI market basket may not include the newest consumer products. *(Result: CPI measures prices but not the increase in choices)*

3. **Product Quality**- The CPI ignores both improvements and decline in product quality. *(Result: CPI may suggest that prices stay the same though the economic well being has improved significantly)*
Calculating Nominal GDP, Real GDP, and Inflation
Calculating CPI

<table>
<thead>
<tr>
<th>Year</th>
<th>Units of Output</th>
<th>Price Per Unit</th>
<th>Nominal, GDP</th>
<th>Real, GDP</th>
<th>CPI/ GDP Deflator (Year 1 as Base Year)</th>
<th>Inflation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>$4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>15</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>20</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>25</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Make year one the base year

\[ \text{CPI} = \frac{\text{Price of the same market basket in the particular year}}{\text{Price of market basket in base year}} \times 100 \]
## Calculating CPI

<table>
<thead>
<tr>
<th>Year</th>
<th>Units of Output</th>
<th>Price Per Unit</th>
<th>Nominal, GDP</th>
<th>Real, GDP</th>
<th>CPI/ GDP Deflator (Year 1 as Base Year)</th>
<th>Inflation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>$4</td>
<td>$40</td>
<td>$40</td>
<td>100</td>
<td>N/A</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>5</td>
<td>50</td>
<td>40</td>
<td>125</td>
<td>25%</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
<td>6</td>
<td>90</td>
<td>60</td>
<td>150</td>
<td>20%</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
<td>8</td>
<td>160</td>
<td>80</td>
<td>200</td>
<td>33.33%</td>
</tr>
<tr>
<td>5</td>
<td>25</td>
<td>4</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>-50%</td>
</tr>
</tbody>
</table>

### Inflation Rate

\[
\text{% Change in Prices} = \frac{\text{Year 2} - \text{Year 1}}{\text{Year 1}} \times 100
\]
Calculating GDP Deflator

\[
\text{GDP Deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100
\]

\[
\text{Nominal GDP} = \frac{\text{Deflator (Real GDP)}}{100}
\]
Calculations

1. In an economy, Real GDP (base year = 1996) is $100 billion and the Nominal GDP is $150 billion. Calculate the GDP deflator.

2. In an economy, Real GDP (base year = 1996) is $125 billion and the Nominal GDP is $150 billion. Calculate the GDP deflator.


Review
1. Identify the 3 goals of all economies
2. Define Natural Rate of Unemployment
3. Define inflation rate
4. What is a market basket?
5. Explain the difference between nominal and real interest rates
6. How do you calculate CPI?
7. What does a CPI of 130 mean?
8. Who is helped and hurt by inflation?
9. Why did Bolivia experience hyperinflation?
10. List 10 old-school Nintendo games
## Practice

<table>
<thead>
<tr>
<th>Year</th>
<th>Units of Output</th>
<th>Price Per Unit</th>
<th>Nominal, GDP</th>
<th>Real, GDP</th>
<th>Consumer Price Index (Year 3 as Base Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>$6</td>
<td>$30</td>
<td>$50</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>8</td>
<td>80</td>
<td>100</td>
<td>80</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>10</td>
<td>200</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>40</td>
<td>12</td>
<td>480</td>
<td>400</td>
<td>120</td>
</tr>
<tr>
<td>5</td>
<td>50</td>
<td>14</td>
<td>700</td>
<td>500</td>
<td>140</td>
</tr>
</tbody>
</table>

**Make year three the base year**

\[
\text{CPI} = \frac{\text{Price of market basket in the particular year}}{\text{Price of the same market basket in base year}} \times 100
\]
Three Causes of Inflation

1. If everyone suddenly had a million dollars, what would happen?
2. What two things cause prices to increase? Use Supply and Demand
3 Causes of Inflation

1. The Government Prints TOO MUCH Money (The Quantity Theory)

- Governments that keep printing money to pay debts end up with hyperinflation.
- There are more “rich” people but the same amount of products.
- Result: Banks refuse to lend and GDP falls

Examples:
- Bolivia, Peru, Brazil
- Germany after WWI
Quantity Theory of Money

If the real GDP in a year is $400 billion but the amount of money in the economy is only $100 billion, how are we paying for things?

The velocity of money is the average times a dollar is spent and re-spent in a year.

How much is the velocity of money in the above example?

**Quantity Theory of Money Equation:**

\[ M \times V = P \times Y \]

- \( M \) = money supply
- \( P \) = price level
- \( V \) = velocity
- \( Y \) = quantity of output

Notice that \( P \times Y \) is GDP.
\[ M \times V = P \times Y \]

Why does printing money lead to inflation?

• Assume the velocity is relatively constant because people's spending habits are not quick to change.
• Also assume that output (Y) is not affected by the amount of money because it is based on production, not the value of the stuff produced.

If the government increases the amount of money (M) what will happen to prices (P)?

Ex: Assume money supply is $5 and it is being used to buy 10 products with a price of $2 each.

1. How much is the velocity of money?
2. If the velocity and output stay the same, what will happen if the amount of money is increase to $10?

Notice, doubling the money supply doubles prices
What would happen if the government decided to pay off the $13 Trillion national debt all at once?
3 Causes of Inflation

2. DEMAND-PULL INFLATION

“Too many dollars chasing too few goods”

DEMAND PULLS UP PRICES!!!

• Demand increases but supply stays the same. What is the result?
• A Shortage driving prices up
• An overheated economy with excessive spending but same amount of goods.
3 Causes of Inflation

3. COST-PUSH INFLATION

Higher production costs increase prices

A negative supply shock increases the costs of production and forces producers to increase prices.

Examples:

- Hurricane Katrina destroyed oil refineries and causes gas prices to go up. Companies that use gas increase their prices.
Cost-Push Inflation

"This new tax plan sounds pretty good... we get a 9% cut and business picks up the burden..."
A Perpetual Process:
1. Workers demand raises
2. Owners increase prices to pay for raises
3. High prices cause workers to demand higher raises
4. Owners increase prices to pay for higher raises
5. High prices cause workers to demand higher raises
6. Owners increase prices to pay for higher raises
Balance of Trade vs. Balance of Payments
Balance of Trade

Net Exports \( (X_N) = \text{Exports} - \text{Imports} \)

Trade Surplus = Exporting more than is imported

Trade Deficit (aka. trade gap) = Exporting less than is imported

### Principal U.S. Exports and Imports of Goods, 2002
(in Billions of Dollars)

<table>
<thead>
<tr>
<th>Exports</th>
<th>Amount</th>
<th>Imports</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemicals</td>
<td>$49.8</td>
<td>Automobiles</td>
<td>$114.1</td>
</tr>
<tr>
<td>Semiconductors</td>
<td>42.3</td>
<td>Petroleum</td>
<td>103.6</td>
</tr>
<tr>
<td>Consumer durables</td>
<td>40.1</td>
<td>Computers</td>
<td>75.3</td>
</tr>
<tr>
<td>Computers</td>
<td>38.6</td>
<td>Household appliances</td>
<td>66.4</td>
</tr>
<tr>
<td>Generating equipment</td>
<td>27.6</td>
<td>Clothing</td>
<td>64.3</td>
</tr>
<tr>
<td>Aircraft</td>
<td>26.7</td>
<td>Chemicals</td>
<td>33.1</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>22.2</td>
<td>Consumer electronics</td>
<td>32.8</td>
</tr>
<tr>
<td>Automobiles</td>
<td>20.5</td>
<td>Semiconductors</td>
<td>26.0</td>
</tr>
<tr>
<td>Grains</td>
<td>14.4</td>
<td>Telecommunications</td>
<td>23.2</td>
</tr>
<tr>
<td>Nonferrous metals</td>
<td>12.2</td>
<td>Iron and steel</td>
<td>17.7</td>
</tr>
</tbody>
</table>

Source: Consolidated from Department of Commerce data.
The United States trade deficit has grown sharply over the last decade.
Balance of Payments (BOP)

Balance of trade includes only goods and service but balance of payments considers ALL international transactions.

- The balance of payments is a broader measure of international trade.

Details:
The BOP summary is within a given year
Prepared in the domestic country’s currency
Ex. If accounting the BOP of the U.S. it would be in the Dollar.

The balance of payments is made up of two accounts. The **current account** and the capital account.
Which countries have the highest account surpluses and account deficits?

<table>
<thead>
<tr>
<th>RANK</th>
<th>COUNTRY</th>
<th>CURRENT ACCOUNT BALANCE</th>
<th>DATE OF INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>China</td>
<td>$296,200,000,000</td>
<td>2009 est.</td>
</tr>
<tr>
<td>2</td>
<td>Japan</td>
<td>$131,200,000,000</td>
<td>2009 est.</td>
</tr>
<tr>
<td>3</td>
<td>Germany</td>
<td>$109,700,000,000</td>
<td>2009 est.</td>
</tr>
<tr>
<td>4</td>
<td>Switzerland</td>
<td>$79,180,000,000</td>
<td>2009 est.</td>
</tr>
<tr>
<td>5</td>
<td>Norway</td>
<td>$58,560,000,000</td>
<td>2009 est.</td>
</tr>
<tr>
<td>6</td>
<td>European Union</td>
<td>$51,400,000,000</td>
<td>2009 est.</td>
</tr>
<tr>
<td>7</td>
<td>Russia</td>
<td>$42,080,000,000</td>
<td>2009 est.</td>
</tr>
<tr>
<td>8</td>
<td>Taiwan</td>
<td>$34,040,000,000</td>
<td>2009 est.</td>
</tr>
<tr>
<td>9</td>
<td>Netherlands</td>
<td>$33,720,000,000</td>
<td>2009 est.</td>
</tr>
<tr>
<td>182</td>
<td>Belgium</td>
<td>-$18,920,000,000</td>
<td>2009 est.</td>
</tr>
<tr>
<td>183</td>
<td>United Kingdom</td>
<td>-$32,370,000,000</td>
<td>2009 est.</td>
</tr>
<tr>
<td>184</td>
<td>Australia</td>
<td>-$33,310,000,000</td>
<td>2009 est.</td>
</tr>
<tr>
<td>185</td>
<td>Canada</td>
<td>-$36,320,000,000</td>
<td>2009 est.</td>
</tr>
<tr>
<td>186</td>
<td>Greece</td>
<td>-$40,820,000,000</td>
<td>2009 est.</td>
</tr>
<tr>
<td>187</td>
<td>France</td>
<td>-$43,670,000,000</td>
<td>2009 est.</td>
</tr>
<tr>
<td>188</td>
<td>Italy</td>
<td>-$55,440,000,000</td>
<td>2009 est.</td>
</tr>
<tr>
<td>189</td>
<td>Spain</td>
<td>-$69,460,000,000</td>
<td>2009 est.</td>
</tr>
<tr>
<td>190</td>
<td>United States</td>
<td>-$380,100,000,000</td>
<td>2009 est.</td>
</tr>
</tbody>
</table>
Current Account

The Current Account is made up of three parts:

1. **Trades in Goods and Services** (Net Exports)-
   Difference between a nation’s exports of goods and services and its imports of goods and services
   
   Ex: Toys imported from China, US cars exported to Mexico

2. **Investment Income**- income from the factors of productions including payments made to foreign investors.
   
   Ex: Money earned by Japanese car producers in the US

3. **Net Transfers**- Money flows from the private or public sectors
   
   Ex: donations, aids and grants, official assistance
Capital (Financial) Account

The Capital Account measures the purchase and sale of financial assets abroad.

Purchases of things that stay in the foreign country.

Examples:
- US company buys a hotel in Russia
- A Korean company sells a factory in Ohio
- Australian company owns local Mall
Current or Capital Account?
Identify if the examples are counted in the current or capital account and determine if it is a credit or debit for the US.

1. Bill, an American, invests $20 million in a ski resort in Canada
2. A Korean company sells vests to the US Military
3. A US company, Boeing, sells twenty 747s to France
4. A Chinese company buys a shopping mall in San Diego
5. An illegal immigrant sends a portion of his earning to his family
6. An German investor buys $50,000 US Treasury Bonds
7. Italian tourists spend 5 million in the US while American tourists spend 8 million in Italy.
Current or Capital Account?

Identify if the examples are counted in the current or capital account and determine if it is a credit or debit for the US.

1. Capital Account (financial asset), Debit
2. Current Account (trade of goods/services), Debit
3. Current Account (trade of goods/services), Credit
4. Capital Account (financial asset), Credit
5. Current Account (net transfer), Debit
6. Capital Account (financial asset), Credit
7. Current Account (net transfer), Debit
Practice

1. U.S. income increases relative to other countries. Does the balance of payments move toward a deficit or a surplus?
   - Imports are cheaper
   - Americans import more
   - Net exports \((X_n)\) decrease
   - The current account balance decreases and moves toward a **deficit**.

2. If the U.S. dollar depreciates relative to other countries does the balance of payments move toward a deficit or a surplus?
   - US exports are desirable
   - America exports more
   - Net exports \((X_n)\) increase
   - The current account balance decreases and moves toward a **surplus**.
2. Balance of payments accounts record all of a country’s international transactions during a year.

   (a) Two major subaccounts in the balance of payments accounts are the current account and the capital account. In which of these subaccounts will each of the following transactions be recorded?

      (i) A United States resident buys chocolate from Belgium.

      (ii) A United States manufacturer buys computer equipment from Japan.

   (b) How would an increase in the real income in the United States affect the United States current account balance? Explain.

   **6 points (2 + 2 + 2)**

   (a) 2 points:
      • One point is earned for stating that the transaction will be recorded in the current account.
      • One point is earned for stating that the transaction will be recorded in the current account.

   (b) 2 points:
      • One point is earned for stating that the current account balance will decrease or move toward a deficit.
      • One point is earned for explaining that the increase in income causes imports to increase.
Foreign Exchange
(aka. FOREX)

Exchange Rate = Relative Price of Currencies
Video: Down and Out Dollar
Exports and Imports

1. US sells cars to Mexico
2. Mexico buys tractors from Canada
3. Canada sells syrup to the U.S.
4. Japan buys Fireworks from Mexico

For all these transactions, there are different national currencies. Each country must be paid in their own currency. The buyer (importer) must exchange their currency for that of the sellers (exporter).
The turnover in FOREX markets is almost $4 trillion (USD) a day

**Currency Codes**
- USD = US Dollar
- EUR = Euro
- JPY = Japanese Yen
- GBP = British Pound
- CHF = Swiss Franc
- CAD = Canadian Dollar
- AUD = Australian Dollar
- NZD = New Zealand Dollar
## Currencies

<table>
<thead>
<tr>
<th>Currency</th>
<th>U.S. Dollar to Foreign Currency ($1 = )</th>
<th>Foreign Currency to U.S. Dollars</th>
<th>Change in U.S. Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Euro</td>
<td>0.7335</td>
<td>1.3634</td>
<td>-0.0012</td>
</tr>
<tr>
<td>Japanese Yen</td>
<td>91.6700</td>
<td>0.0109</td>
<td>+0.0400</td>
</tr>
<tr>
<td>British Pound</td>
<td>0.6459</td>
<td>1.5482</td>
<td>-0.0004</td>
</tr>
<tr>
<td>Canadian Dollar</td>
<td>1.0387</td>
<td>0.9627</td>
<td>+0.0001</td>
</tr>
<tr>
<td>Swiss Franc</td>
<td>1.0750</td>
<td>0.9302</td>
<td>-0.0016</td>
</tr>
<tr>
<td>Czech Koruna</td>
<td>18.8030</td>
<td>0.0532</td>
<td>-0.1090</td>
</tr>
<tr>
<td>Danish Krone</td>
<td>5.4566</td>
<td>0.1833</td>
<td>-0.0093</td>
</tr>
<tr>
<td>Hong Kong Dollar</td>
<td>7.7653</td>
<td>0.1288</td>
<td>-0.0016</td>
</tr>
<tr>
<td>Mexican Peso</td>
<td>12.7843</td>
<td>0.0782</td>
<td>+0.0067</td>
</tr>
<tr>
<td>Norwegian Krone</td>
<td>5.9183</td>
<td>0.1690</td>
<td>-0.0200</td>
</tr>
<tr>
<td>Swedish Krona</td>
<td>7.1951</td>
<td>0.1390</td>
<td>-0.0253</td>
</tr>
<tr>
<td>Singapore Dollar</td>
<td>1.4082</td>
<td>0.7101</td>
<td>-0.0026</td>
</tr>
<tr>
<td>Brazilian Real</td>
<td>1.8120</td>
<td>0.5519</td>
<td>+0.0005</td>
</tr>
<tr>
<td>South African Rand</td>
<td>7.6323</td>
<td>0.1310</td>
<td>-0.0146</td>
</tr>
<tr>
<td>Israeli Shekel</td>
<td>3.7800</td>
<td>0.2646</td>
<td>+0.0118</td>
</tr>
<tr>
<td>Australian Dollar</td>
<td>1.1098</td>
<td>0.9011</td>
<td>-0.0028</td>
</tr>
<tr>
<td>New Zealand Dollar</td>
<td>1.4237</td>
<td>0.7024</td>
<td>-0.0063</td>
</tr>
</tbody>
</table>
Exchange Rates

In the FOREX market we only look at two countries/currencies at a time

Ex: US Dollars and British Pounds

We examine the price of one currency in terms of the other currency. Ex: $2 = £1

The Exchange Rate depends on which currency you are converting.

The price of one US Dollar in terms of Pounds is

1 Dollar = £1/$2 = £.5

The price of one Pound in terms of Dollars is

1 Pound = $2/£1 = $2
What happens if you need more dollar to buy one pound (the price for a pound increases)?

Ex: From $2=£1 to $5=£1

• The U.S. Dollar **DEPRECIATES** relative to the Pound.

**Depreciation**

• The loss of value of a country's currency with respect to a foreign currency

• More units of dollars are needed to buy a single unit of the other currency.

• The dollar is said to be “Weaker”
What happens if you need less dollar to buy one pound (the price for a pound decreases)?

Ex: From $2=£1 to $1=£4

• The U.S. Dollar **APPRECIATES** relative to the Pound.

**Appreciation**

• The increase of value of a country's currency with respect to a foreign currency
• Less units of dollars are needed to buy a single unit of the other currency.
• The dollar is said to be “Stronger”
S&D for the US Dollars

Price of US Dollars

Supply by Americans

Demand by British

Equilibrium: $1 = £1

US Dollar appreciates

US Dollar depreciates

Quantity of US Dollars Q

2£/1$

1£/1$

1£/4$
FOREX Supply and Demand
Simplified

Imagine a huge table with all the different currencies from every country
This is the Foreign Exchange Market!

Just like at a product market, you can’t take things without paying.

If you **demand** one currency, you must **supply** your currency.

Ex: If Canadians **demand** Russian Rubles. The demand for Rubles in the FOREX market will increase and the supply of Canadian Dollars will increase.
FOREX Shifters

Let’s use the example of the US Dollar and the British Pound
1. Changes in Tastes-
Ex: British tourists flock to the U.S…
   Demand for U.S. dollars increases (shifts right)
   Supply of British pounds increases (shifts right)
   *Pound-deprecicates*
   *Dollar-appreciates*

2. Changes in Relative Incomes (Resulting in more imports)-
Ex: US growth increase US incomes….
   U.S. buys more imports…
   U.S. Demand for pounds increases
   Supply of U.S. dollars increases
   *Pound- appreciates*
   *Dollar- depreciates*
3. Changes in Relative Price Level
(Resulting in more imports)-
Ex: US prices increase relative to Britain….
  U.S. demand for cheaper imports increases…
  U.S. demand for pounds increases
Supply of U.S. dollars increases
  Pound- appreciates
  Dollar- depreciates

4. Changes in relative Interest Rates-
Ex: US has a higher interest rate than Britain.
  British people want to invest in US
  Capital Flow increase towards the US
  British demand for U.S. dollars increases…
  British supply more pounds
  Pound-depreciates
  Dollar- appreciates
Practice
For each of the following examples, identify what will happen to the value of US Dollars and Japanese Yen.

1. American tourists increase visits to Japan.
2. The US government significantly decreases personal income tax.
3. Inflation in the Japan rises significantly faster than in the US.
4. Japan has a large budget deficit that increases Japanese interest rates.
5. Japan places high tariffs on all US imports.
6. The US suffers a larger recession.
7. The US Federal Reserve sells bonds at high interest rates.

How do these scenarios affect exports and imports?
Practice

For each of the following examples, identify what will happen to the value of US Dollars and Japanese Yen.

1. USD depreciates and Yen appreciates
2. USD depreciates and Yen appreciates
3. USD appreciates and Yen depreciates
4. USD depreciates and Yen appreciates
5. USD depreciates (Demand Falls) and Yen appreciates (Supply Falls)
6. USD appreciates (Supply Falls) and Yen depreciates (Demand Falls)
7. USD appreciates and Yen depreciates

Scenarios 1, 2, and 4 will increase US exports because US products are now relatively “cheaper”