National Income Accounting
Definition

The **market value** of all **final goods & services** produced within a country during a specific period of time.

- **“Market value”**
  - Use the good or service’s price to weigh the value of production.

<table>
<thead>
<tr>
<th>2008 Physical Output</th>
<th>Market Price</th>
<th>Market Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 Oranges</td>
<td>$1.00</td>
<td>$100.00</td>
</tr>
<tr>
<td>50 Bicycles</td>
<td>$100.00</td>
<td>$5000.00</td>
</tr>
<tr>
<td>20 Rock Concerts</td>
<td>$200.00</td>
<td>$4000.00</td>
</tr>
<tr>
<td><strong>Quantity = 170 units</strong></td>
<td>-</td>
<td><strong>GDP = $9,100.00</strong></td>
</tr>
</tbody>
</table>
Gross Domestic Product (GDP)

- “Final goods & services”

**Final Good**
- A good that is sold, or ready to be sold, for final use.
- No further value to be added.

**Intermediate Good**
- A good sold for further processing and additional value to be added.

**Resale & Used Goods**
- Goods previously accounted for in GDP.

Market Expenditure = $1,000

Mining Iron $1,000
Steel $3,000
Auto $10,000
Retailer $15,000
Consumer

Value Added = $1,000

$2,000
$7,000
$5,000

= $15,000

Be careful not to sum the market expenditures at every stage of production i.e. “Double Counting” \((1000+3000+10000+15000=29000)\)
Gross Domestic Product (GDP)

- “Produced”
  - Measures the flow of actual new output available for use in the economy.

- “Within a country”
  - Geographically bound.

- “During a specific period of time”
  - Typically calculated by the Bureau of Economic Advisors (BEA) on a quarterly basis.
Measuring GDP: The Expenditure Approach

- Expenditure approach recognizes:
  - Sum value added = Final Market Expenditure (i.e. “Final Good”).
Measuring GDP: Expenditure Approach

- **Expenditure Components**
  - **Personal Consumption** (C)
    - Household expenditures
  - **Gross Private Domestic Investment** (I)
    - Firm expenditures
  - **Government Consumption & Gross Investment** (G)
    - Government Expenditures
  - **Net Exports** of Goods & Services (NX*)
    - Foreign Sector expenditures
    - Net Exports (NX) = Exports (E) − Imports (M)

\[
\text{GDP} = C + I + G + NX^* 
\]

*can be a negative value*
Measuring GDP: Expenditure Approach

- **Personal Consumption** (C)
  - Durable Goods
    - ≥ 3 years
  - Non-Durable Goods
    - < 3 years
  - Services

Excludes New Residential Homes.

Includes Domestic & Foreign Products

70% of GDP
Measuring GDP: Expenditure Approach

- **Gross Private Domestic Investment (I)**
  - Fixed Investment
    - Includes Residential Investment
  - Inventory Investment

\[
\text{Gross Investment} - \text{Depreciation} = \text{Net Investment}
\]

Includes Domestic & Foreign Products

14% of GDP

Different than “Investment” in stocks or bonds
Measuring GDP: Expenditure Approach

- **Government Consumption & Gross Investment (G)**
  - Consumption
  - Investment
  - Includes all Levels of Gov. Expenditures
  - Excludes Transfer Payments
  - Includes Domestic & Foreign Products
  - 20% of GDP

- **Net Exports of Goods & Services (NX)**
  - Exports (E)
    - Foreign expenditures on domestic products.
  - Imports (M)
    - Domestic expenditures on foreign products.
  - -4% of GDP
Applications: Using the Expenditure Approach analyze each of the following scenarios.

- Determine the type of product being purchased and whether it should be counted or not.
- If counted, what category(s) will the expenditure will be reflected under: C, I, G, or NX?
- What subcategory will the expenditure be reflected under:
- Evaluate what the net effect will be on GDP.

<table>
<thead>
<tr>
<th>Expenditure</th>
<th>Product</th>
<th>C</th>
<th>I</th>
<th>G</th>
<th>NX</th>
<th>Net Effect on US GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>$25,000 Toyota Camry produced in US &amp; sold to woman in Japan.</td>
<td>Final</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Export</td>
<td>Increases by $25,000</td>
</tr>
<tr>
<td>A Textbook company buys $5 of paper to use in the production of a Econ book.</td>
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</tr>
<tr>
<td>A newly constructed house in Las Vegas is bought by a family of five for $300,000.</td>
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</tr>
<tr>
<td>US Steel Corporation builds a new manufacturing plant for 1 million dollars in Mississippi.</td>
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</tr>
<tr>
<td>A High School student buys a $120 I-Pod at Best Buy.</td>
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</tr>
<tr>
<td>A recent College Graduate purchases a ten year old condo in Del Mar.</td>
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</tr>
<tr>
<td>Your best friend buys you a $15 Chia-Pet made in Mexico as a Holiday gift.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>US Federal Government purchases a Boeing 747 for $19 million dollars.</td>
<td></td>
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</tr>
<tr>
<td>A sixteen year old buys her first car, a 4 decades old Volkswagen Bug for $500.</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>A New-Car retailer has $900,000 worth of cars sitting on his lot ready to sell at the end of the year.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Two Ways of Measuring GDP

GDP is a measure of both output and income. Thus, there are two ways it can be measured.

• expenditure approach.
• resource cost-income approach.

Dollar flow of expenditures on final goods = GDP = Dollar flow of income of final goods

“National Income Identity”
Expenditures = Income
Measuring GDP: Resource Cost-Income Approach

- **Income Components**
  - Employee Compensation (W)
  - Net Interest (I)
  - Rental Income (R)
  - Corporate & Self-Employed Proprietor Profits (P)

\[ \text{GDP} = W + I + R + P \]
Wages
- Hourly wages & Salaries
- Supplemental Benefits
- Employer paid taxes

55% of Income

Rents
- Real Property
  - Landlord collections

2% of Income

Interest
- Net Interest
  - Households earn – Households pay
  - Interest paid by businesses

5% of Income

Profits
- Sole Proprietors & Partnerships
- Corporations
  - Shareholder Dividends
  - Retained Earnings

17% of Income
Net Income of Foreigners = Income earned by foreign factors employed in the US - Income earned by US factors employed abroad

Depreciation

- Aka: Capital Consumption Allowance
- Replacement of worn out capital
Indirect Business Taxes

- Monies Collected by the government.
- Reflected in the expenditure but not in Income.

Sales Tax
- 9% of price

Gas Tax
- 0.64 per Gallon

Cigarette Tax
- 0.87 per pack

Statistical Discrepancy

- The National Income Identity
  - Income = Expenditure
- Both approaches use different sets of data
  - Income vs. Sales data
- Accounting equalizer.

8% of Income
Summary of the Income-Resource Cost Approach

\[ GDP = W + R + I + P + NIF^* + D + IDT + SD^* \]

- **Aggregate Income**
- **Aggregate Income Adjustments**

*can be a negative value*
Gross National Product (GNP)

- Measures production by US factors regardless of where the production occurs.

Net Income of Foreigners = Income earned by foreign factors employed in the US - Income earned by US factors employed abroad

<table>
<thead>
<tr>
<th>2011 GDP Billions</th>
<th>- NIF</th>
<th>GNP</th>
</tr>
</thead>
<tbody>
<tr>
<td>15,094</td>
<td>-200</td>
<td>14,894</td>
</tr>
</tbody>
</table>
Net National Product (NNP)

- Measures production by US factors, regardless of where production occurs.
- Excludes production to maintain existing capital stock. (i.e. Depreciation, Capital Consumption Allowance)

**GNP – Depreciation**

Better indicator of production toward increased standard of living since it represents new output.

NDP is a related measure that subtracts depreciation from the geographically bound GDP rather than GNP.
National Income

• Measures production by US factors, regardless of where production occurs.
  AND

• Excludes production to maintain existing capital stock.
  (i.e. Depreciation, Capital Consumption Allowance)
  AND

• Excludes Indirect Business Taxes

  NNP – Indirect Business Taxes

Indicator of income generated by US factors from new production.
• **Application:** Using the below complete the missing categories.

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumption Expenditures</td>
<td>9,710</td>
</tr>
<tr>
<td>Wages</td>
<td>7,812</td>
</tr>
<tr>
<td>Government Expenditures</td>
<td>2,674</td>
</tr>
<tr>
<td>Exports</td>
<td>1,662</td>
</tr>
<tr>
<td>Imports</td>
<td>2,370</td>
</tr>
<tr>
<td>Profits</td>
<td>2,698</td>
</tr>
<tr>
<td>Rent</td>
<td>40</td>
</tr>
<tr>
<td>Investment Expenditures</td>
<td>2,130</td>
</tr>
<tr>
<td>Interest</td>
<td>664</td>
</tr>
<tr>
<td>Indirect business taxes</td>
<td>1,055</td>
</tr>
<tr>
<td>Depreciation</td>
<td>1,720</td>
</tr>
<tr>
<td>Net Income of Foreigners</td>
<td>102</td>
</tr>
<tr>
<td>Statistical Discrepancy</td>
<td></td>
</tr>
<tr>
<td>GDP (Expenditure approach)</td>
<td></td>
</tr>
<tr>
<td>GDP (Income approach)</td>
<td></td>
</tr>
<tr>
<td>GNP</td>
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<td></td>
</tr>
<tr>
<td>National Income</td>
<td></td>
</tr>
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GDP changes over time

- Prices of all goods & services change over time
- Production is what we want to measure
- If prices double year over year → double production
- In order to be able to accurately compare production over time we need to hold prices constant.

**Nominal GDP**
- The value of GDP measured in same-year prices.

**Real GDP**
- The value of GDP measured in base-year prices.

<table>
<thead>
<tr>
<th>Year</th>
<th>Units of Output</th>
<th>Price of Pizzas</th>
<th>Nominal GDP</th>
<th>Real GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>7</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>8</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>11</td>
<td>28</td>
<td></td>
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<td>5</td>
<td>10</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>2</td>
<td>7</td>
<td>20</td>
<td>140</td>
<td>70</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
<td>25</td>
<td>200</td>
<td>80</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>30</td>
<td>300</td>
<td>100</td>
</tr>
<tr>
<td>5</td>
<td>11</td>
<td>28</td>
<td>308</td>
<td>110</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Percentage change over 5 years</strong></td>
<td><strong>516%</strong></td>
</tr>
</tbody>
</table>

Which indicator more accurately reflects changes in production over the five years?
Real GDP Changes over time:
Economic Growth & Economic Fluctuations

Business Cycle Phases:
- Peak
- Contraction
- Trough
- Expansion

Related Terms:
- Recovery
- Boom
- Recession
- Depression
Per Capita GDP

GDP / Population

United States
- Population: ≈ 307 million
- GDP: ≈ $15 trillion
- Per Capita Income: ≈ $48,000

Liechtenstein
- Population: ≈ 36,713
- GDP: ≈ $4 Billion
- Per Capita Income: ≈ $141,000
Per Capita GDP

Liberia = $400
Ethiopia = $1,100
Congo = $300

Per Capita GDP is a more accurate gauge for international comparisons
Per Capita GDP over Time

As shown here, the real 2010 GDP per capita figure of the U.S. was approximately six times the same figure for 1930.

Source: derived from U.S. Department of Commerce data.
Limitations of GDP as a Standard of Living Gauge.

- Non-Market Production
- Underground Economy
- Leisure Time
- Working Conditions
  - Less laborious work equates to a higher standard of living.
- Economic “Bads”
  - Pollution
  - Crime & Social Problems
- Imbalances in the Economy
  - Growing GDP through debt.
  - Ratio of government relative to private sector spending.

### Shadow Economies Around the World

<table>
<thead>
<tr>
<th>Countries</th>
<th>“Shadow” economy as % of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>28.9%</td>
</tr>
<tr>
<td>Australia</td>
<td>13.5%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>12.2%</td>
</tr>
<tr>
<td>United States</td>
<td>8.4%</td>
</tr>
<tr>
<td>Japan</td>
<td>10.8%</td>
</tr>
<tr>
<td>Mexico</td>
<td>33.2%</td>
</tr>
<tr>
<td>Peru</td>
<td>60.9%</td>
</tr>
<tr>
<td>Sweden</td>
<td>18.3%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>9.4%</td>
</tr>
<tr>
<td>Avg. former Soviet bloc/eastern European</td>
<td>40.1%</td>
</tr>
</tbody>
</table>