Lecture 5
Economic Fluctuations and Unemployment

What are all those flashing dashboard lights?

Economic Indicators.

B. Rich
HEDGEYE
“Unemployment is not a crime. It is a social ill full of hardships, setbacks, anxieties, needs and sacrifices which would be lauded under any other circumstances. It is truly the weakest spot in Democracy’s armor, the likely erosion point in the social structure, and the damning mark of false, unstable or lopsided prosperities.”

- William Wakeham (1951)
Growth and Fluctuations

Two questions:

1. Is long-run growth steady?
2. Is long-run growth smooth?

- The average growth rate from 1921 – 2014 was 2.0% per annum. In contrast, the average growth rate was only 0.9% from 1875 to 1914.
Growth and Fluctuations

A Stylized Business Cycle

GDP

Year

Peak

Contraction

Expansion

Trough

Y*

GDP growth (%)

Unemployment rate (%)

Year

1918
End of WW1

1929
Start of the Great Depression

2008
Start of the global financial crisis

Business cycle peak

Business cycle trough
Unemployment and Growth

- **Germany (1970-2013)**
  
  \[ y = -0.2048x + 0.5329 \]
  
  \[ R^2 = 0.2198 \]

- **Spain (1961-2013)**
  
  \[ y = -0.3597x + 1.7471 \]
  
  \[ R^2 = 0.362 \]

- **Japan (1961-2013)**
  
  \[ y = -0.0291x + 0.1574 \]
  
  \[ R^2 = 0.1615 \]

- **US (1961-2013)**
  
  \[ y = -0.3768x + 1.2298 \]
  
  \[ R^2 = 0.641 \]

- **Brazil (1990-2013)**
  
  \[ y = -0.1182x + 0.4161 \]
  
  \[ R^2 = 0.2247 \]

- **Malaysia (1990-2013)**
  
  \[ y = -0.0511x + 0.3176 \]
  
  \[ R^2 = 0.4701 \]
Unemployment and Growth

• *Okun’s Law*: The empirical regularity that changes in the rate of growth of GDP are negatively correlated with the rate of unemployment.

• The basic idea works like this:

1. A fall in output growth
2. A rise in the unemployment rate
3. A fall in wellbeing
Defining Gross Domestic Product

• *Gross Domestic Product*: A measure of the total market value of final goods and services newly produced within a country’s borders over a period of time.

Unpacking the meaning...

• “Market value”
  • *Imputation*: A procedure for assigning value when there is no clear market value

• “Final goods and services”
  • A *final good* is one that is ready to use.
  • We do this to avoid double counting of *intermediate goods*, which are goods that undergo some kind of further processing.

• “Newly produced”: Only new goods count.
• “Within a country’s borders”
Definitions

• *Nominal GDP*: GDP expressed in terms of current prices

• *Real GDP*: A measurement of GDP that attempts to reflect actual value of goods and services by controlling for effects of price changes/inflation
• The most common formula for GDP is the one used for the spending approach:

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

• \( C \) = Consumption
• \( I \) = Gross private investment (i.e. business spending)
  • This includes the unsold output that firms produce.
• \( G \) = Government Spending
• \( NX \) = Net Exports
• GDP is also known as aggregate demand
• \textit{Trade balance} : Value of exports minus the value of imports
• \textit{Trade deficit} : A country's negative trade balance (it imports more than it exports).
• \textit{Trade surplus} : A country's positive trade balance (it exports more than it imports).
### Spending Approach to GDP

<table>
<thead>
<tr>
<th></th>
<th>US</th>
<th>EUROZONE (19 COUNTRIES)</th>
<th>CHINA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONSUMPTION (C)</strong></td>
<td>68.4%</td>
<td>55.9%</td>
<td>37.3%</td>
</tr>
<tr>
<td><strong>GOVERNMENT SPENDING (G)</strong></td>
<td>15.1%</td>
<td>21.1%</td>
<td>14.1%</td>
</tr>
<tr>
<td><strong>INVESTMENT (I)</strong></td>
<td>19.1%</td>
<td>19.5%</td>
<td>47.3%</td>
</tr>
<tr>
<td><strong>CHANGE IN INVENTORIES</strong></td>
<td>0.4%</td>
<td>0.0%</td>
<td>2.0%</td>
</tr>
<tr>
<td><strong>EXPORTS (X)</strong></td>
<td>13.6%</td>
<td>43.9%</td>
<td>26.2%</td>
</tr>
<tr>
<td><strong>IMPORTS (M)</strong></td>
<td>16.6%</td>
<td>40.5%</td>
<td>23.8%</td>
</tr>
</tbody>
</table>

*Figure 12.8 Decomposition of GDP in 2013 for the US, eurozone and China.* Source
Households and Fluctuations

\[
\text{Percentage change in GDP} = \left( \frac{\text{percentage change in consumption}}{\text{share of consumption in GDP}} \right) + \left( \frac{\text{percentage change in investment}}{\text{share of investment in GDP}} \right) + \left( \frac{\text{percentage change in government spending}}{\text{share of government spending in GDP}} \right) + \left( \frac{\text{percentage change in net exports}}{\text{share of net exports in GDP}} \right)
\]

<table>
<thead>
<tr>
<th></th>
<th>GDP</th>
<th>CONSUMPTION</th>
<th>INVESTMENT</th>
<th>GOVERNMENT SPENDING</th>
<th>NET EXPORTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>-2.8</td>
<td>-1.06</td>
<td>-3.52</td>
<td>0.64</td>
<td>1.14</td>
</tr>
</tbody>
</table>

Figure 12.9 Contributions to percentage change in real GDP in the US in 2009. Source
Limitations to GDP

Some Obvious Limitations

• Unpaid work within the household
  • Child care, cooking, cleaning, landscaping, repair work
  • Including these would raise the level of G.D.P. 39 percent in 1965 and 25.7 percent in 2010.

• Doesn’t necessarily account for changes in quality
• Valuing services generally difficult
• “Off the books” economic activity
Some critiques of GDP

- Doesn’t account for volunteer work
- No value given to leisure time
- No attempts to measure human/social capital changes
- Ignores the environment
- Values defensive expenditures similarly to all others
- Products and production methods that reduce well-being are counted same as those that increase it
- Wealth and financial debt are ignored
- Treat finance as a final and not intermediate good
- Economic and social inequality is ignored
Some critiques of GDP

Example economy

Poorest 50%

Middle 40%

Richest 10%

Growth scenario 1

Growth scenario 2

+2.8%

+4.0%

+4.5%

No growth

Total economy $105 +5%

Note: Numbers are only for purposes of example.
Broadening Our Approach

Three Questions:

• What should we measure?

• What should be used as a unit of measurement?

• Should we try to combine various indicators into one general number, or keep them separate?
## Genuine Progress Indicator, United States, 2004

<table>
<thead>
<tr>
<th>Component of GPI</th>
<th>Value (billions of dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal consumption</td>
<td>7,589</td>
</tr>
<tr>
<td>Personal consumption after inequality adjustment</td>
<td>6,318</td>
</tr>
<tr>
<td>Value of household work and parenting</td>
<td>+ 2,542</td>
</tr>
<tr>
<td>Value of higher education</td>
<td>+ 828</td>
</tr>
<tr>
<td>Value of volunteer work</td>
<td>+ 131</td>
</tr>
<tr>
<td>Service value of consumer durables</td>
<td>+ 744</td>
</tr>
<tr>
<td>Service value of highways and streets</td>
<td>+ 112</td>
</tr>
<tr>
<td>Costs of crime</td>
<td>— 34</td>
</tr>
<tr>
<td>Loss of leisure time</td>
<td>— 402</td>
</tr>
<tr>
<td>Costs of underemployment</td>
<td>— 177</td>
</tr>
<tr>
<td>Cost of consumer durables</td>
<td>— 1,090</td>
</tr>
<tr>
<td>Costs of commuting and auto accidents</td>
<td>— 698</td>
</tr>
<tr>
<td>Costs of environmental defensive expenditures</td>
<td>— 21</td>
</tr>
<tr>
<td>Costs of pollution</td>
<td>— 178</td>
</tr>
<tr>
<td>Value of lost wetlands, farmland, and forests</td>
<td>— 368</td>
</tr>
<tr>
<td>Costs of nonrenewable energy depletion</td>
<td>— 1,761</td>
</tr>
<tr>
<td>Damages from carbon emissions and ozone depletion</td>
<td>— 1,662</td>
</tr>
<tr>
<td>Adjustment for capital investment and foreign borrowing</td>
<td>+ 135</td>
</tr>
<tr>
<td><strong>Genuine Progress Indicator</strong></td>
<td><strong>4,419</strong></td>
</tr>
</tbody>
</table>
Figure 6.2: Comparison of GDP and GPI per Capita, United States, 1970-2004

GDP and GPI Per Capita (2000 US $)

Gross Domestic Product

Genuine Progress Indicator

## Human Development Index

<table>
<thead>
<tr>
<th>Rank</th>
<th>Change in rank from previous year</th>
<th>Country/Territory</th>
<th>HDI</th>
<th>Change from previous year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>—</td>
<td>Norway</td>
<td>0.953</td>
<td>▲ 0.002</td>
</tr>
<tr>
<td>2</td>
<td>—</td>
<td>Switzerland</td>
<td>0.944</td>
<td>▲ 0.001</td>
</tr>
<tr>
<td>3</td>
<td>—</td>
<td>Australia</td>
<td>0.939</td>
<td>▲ 0.001</td>
</tr>
<tr>
<td>4</td>
<td>—</td>
<td>Ireland</td>
<td>0.938</td>
<td>▲ 0.004</td>
</tr>
<tr>
<td>5</td>
<td>▼ (1)</td>
<td>Germany</td>
<td>0.936</td>
<td>▲ 0.002</td>
</tr>
<tr>
<td>6</td>
<td>—</td>
<td>Iceland</td>
<td>0.935</td>
<td>▲ 0.002</td>
</tr>
<tr>
<td>7</td>
<td>▲ (1)</td>
<td>Hong Kong</td>
<td>0.933</td>
<td>▲ 0.003</td>
</tr>
<tr>
<td>7</td>
<td>—</td>
<td>Sweden</td>
<td>0.933</td>
<td>▲ 0.001</td>
</tr>
<tr>
<td>9</td>
<td>▼ (1)</td>
<td>Singapore</td>
<td>0.932</td>
<td>▲ 0.002</td>
</tr>
<tr>
<td>10</td>
<td>—</td>
<td>Netherlands</td>
<td>0.931</td>
<td>▲ 0.003</td>
</tr>
<tr>
<td>11</td>
<td>▼ (1)</td>
<td>Denmark</td>
<td>0.929</td>
<td>▲ 0.001</td>
</tr>
<tr>
<td>12</td>
<td>—</td>
<td>Canada</td>
<td>0.926</td>
<td>▲ 0.004</td>
</tr>
<tr>
<td>13</td>
<td>▼ (1)</td>
<td>United States</td>
<td>0.924</td>
<td>▲ 0.002</td>
</tr>
<tr>
<td>14</td>
<td>—</td>
<td>United Kingdom</td>
<td>0.922</td>
<td>▲ 0.002</td>
</tr>
<tr>
<td>15</td>
<td>—</td>
<td>Finland</td>
<td>0.920</td>
<td>▲ 0.002</td>
</tr>
</tbody>
</table>
Human Development Index

Greatest improvers, 1980-2010, 2010 score, 1=best (Rank out of 169)

- HDI*
- Adjusted for inequality

Tunisia (81) 56.4
China (89) 80.2
Egypt (101) 57.8
Morocco (114) 61.2
India (119) 62.1
Pakistan (125) 57.8
Bangladesh (129) 81.4
Benin (134) 64.8
Nepal (138) 103.7
Mali (160) 88.0
Burundi (166) 55.5
Niger (167) 57.4

Source: UN Human Development Report

*Index of life expectancy, education and GNI per person
## Inequality-Adjusted Human Development Index

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>IHDI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Iceland</td>
<td>0.878</td>
</tr>
<tr>
<td>2</td>
<td>Japan</td>
<td>0.876</td>
</tr>
<tr>
<td>2</td>
<td>Norway</td>
<td>0.876</td>
</tr>
<tr>
<td>4</td>
<td>Switzerland</td>
<td>0.871</td>
</tr>
<tr>
<td>5</td>
<td>Finland</td>
<td>0.868</td>
</tr>
<tr>
<td>6</td>
<td>Sweden</td>
<td>0.864</td>
</tr>
<tr>
<td>7</td>
<td>Australia</td>
<td>0.861</td>
</tr>
<tr>
<td>7</td>
<td>Germany</td>
<td>0.861</td>
</tr>
<tr>
<td>9</td>
<td>Denmark</td>
<td>0.860</td>
</tr>
<tr>
<td>10</td>
<td>Netherlands</td>
<td>0.857</td>
</tr>
<tr>
<td>11</td>
<td>Ireland</td>
<td>0.854</td>
</tr>
<tr>
<td>12</td>
<td>Canada</td>
<td>0.852</td>
</tr>
<tr>
<td>13</td>
<td>New Zealand</td>
<td>0.846</td>
</tr>
<tr>
<td>14</td>
<td>Slovenia</td>
<td>0.846</td>
</tr>
<tr>
<td>15</td>
<td>Czech Republic</td>
<td>0.840</td>
</tr>
</tbody>
</table>

| 16   | Belgium        | 0.836 |
| 17   | Austria        | 0.835 |
| 18   | United Kingdom | 0.835 |
| 19   | Singapore      | 0.816 |
| 20   | Luxembourg     | 0.811 |
| 21   | Hong Kong      | 0.809 |
| 22   | France         | 0.808 |
| 23   | Malta          | 0.805 |
| 24   | Slovakia       | 0.797 |
| 25   | United States  | 0.797 |
| 26   | Estonia        | 0.794 |
| 27   | Israel         | 0.787 |
| 28   | Poland         | 0.787 |
| 29   | South Korea    | 0.773 |
| 30   | Hungary        | 0.772 |
Households and Fluctuations

![Graph showing fluctuations in agriculture, industry, services, and GDP over the years 1550 to 1700. The graph plots growth rate (%) against year.]
Households and Fluctuations

![Graph showing growth rates of Agriculture and GDP from 1550 to 1700](image)
Households and Fluctuations
Households and Fluctuations
In 1960 agriculture comprised 43% of the Indian economy, which had declined to 17% in 2014.

Why is there such high volatility in agriculture?

Besides weather, what else might cause a major economic shock in an agrarian economy?
Households and Fluctuations

• We should distinguish between two kinds of shocks:

1. Good or bad fortune strikes the household
2. Good or bad fortune strikes the economy as a whole

• How do you think households deal with the first situation?
People use two strategies to deal with shocks that are specific to their household:

1. Self-insurance
2. Co-insurance

What are some modern examples of co-insurance that don’t rely on family and friends?
Households and Fluctuations

• These strategies reflect two important aspects of household preferences:

  1. People prefer a relatively smooth pattern of consumption over the short-term
  2. Households are not entirely selfish

• The problem is that co-insurance in an agrarian society does not work if a bad shock hits everyone at the same time. Why not?
Smooth Consumption

- Consumption is an important source of economy-wide stabilization.
- *What can limit a household's ability to smooth their consumption?*
- Three important factors to consider:
  1. Lack of information and/or uncertainty
  2. Credit constraints
  3. Limited co-insurance

- *Who is effected more by temporary shocks? Those with access to credit, or those who are credit-constrained?*
Limited Co-insurance

- Many households lack a network of family and friends who can help out substantially when a negative income shock occurs.
- Government unemployment benefits help, but don’t exist in many places.
- Germany in 2009 is a good example of how smart policy can help smooth consumption.
- For many households, a change in income results in an equal change in consumption.

**Ability to Borrow $3,000 From Family or Friends in an Emergency**

- **White**
  - $0-$20K: 46%
  - $20-$40K: 62%
  - $40-$60K: 71%
- **Black**
  - $0-$20K: 27%
  - $20-$40K: 42%
  - $40-$60K: 51%

• Firms have no motivation to smooth investment spending.
• They spend money (on capital) to make money
• This is likely to produce clusters of investment projects for a few reasons
• *What happens to firms that don’t adopt new and better technology?*
Investment Volatility

- Investment spending by one firm *pushes* other firms to do the same
- Credit availability helps explain the clustering of investment spending
• Imagine a local economy comprising just two firms.
• Firm A is in a situation called *low capacity utilization*.
• Firm B has the same problem.
• Because of low capacity utilization, profits are low for both.
Investment Volatility

- They are in a **vicious circle**
- **What would happen if they both started investing and hiring at the same time?**
Investment Volatility

• Here they are in a virtuous circle.
• How do they move from the vicious to the virtuous circle?
Investment Volatility

• *How volatile do you think government spending is?*
• *And net exports?*
Inflation

- **Inflation**: An increase in the general price level. Usually measured over a year.
- **Deflation**: A decrease in the general price level.
Figure 12.19a UK GDP growth (1875-2014). Source

Figure 12.19c UK inflation rate (1875-2014). Source
Inflation

- **How is inflation measured?**
- **Consumer price index (CPI)**: A measure of the general level of prices that consumers have to pay for goods and services.
- A change in the CPI is often considered a change in the "cost of living".
- **GDP deflator**: A measure of the level of prices for domestically produced output. This is the ratio of nominal (or current price) GDP to real (or constant price) GDP.
- One problem with typical measures of inflation is that they don’t really measure affordability.