US Business Cycles, Theory & Practice

Lecture 17

THE PARTHENON GROUP
200 STATE STREET
BOSTON, MA 02109
US Business Cycles

• What Forces Create Major Business Cycles in the United States?

• Generally, do recessions emanate from government policies or private sector decisions?
The Forces Creating Macroeconomic Cycles

Oil Price Shocks Are Also Commonly Recognized

This Illustration Adapted from *The Economist* is Typical
The Forces Creating Macroeconomic Cycles

The “1 - 1 - 1 Rule”: 1% Lower Rates 1 Year Later Adds 1% to Growth

This link between bond yields and the economy holds until another major force exerts its influence.
The Core Model

**Structural or Behavioral Model**

\[
C = C_0 + C_1 \times (GDP - T) - C_2 \times i \\
I = I_0 + I_1 \times (GDP - GDP(-1)) + I_2 \times I \\
M = M_0 + M_1 \times Y + M_2 \times I \\
X = X_0 + X_1 \times GNPW + X_2 \times I \\
G = G \\
GDP = C + I + G + X - M
\]

Substitute to eliminate all endogenous variables from left-side of each equation

**Reduced Form Model**

**Derived from Structural Model**

- \( C = C(G, T, i, GNPW) \)
- \( I = I(G, T, i, GNPW) \)
- \( M = M(G, T, i, GNPW) \)
- \( X = X(G, T, i, GNPW) \)
- \( GNP = C + I + X - M + G \)

\[
\text{=} GNP(G, T, i, GNPW)
\]
A Reliable Economic Model

Wave-Makers Affecting the Circular Flow of Income and Production

- Major Oil Price Increases
- Competing Imports
- Exchange Rates
- Exports
- Government Spending
- GDP = U.S. Output and Income
- Private Sector Spending
- Stock Market
- Federal Reserve & Interest Rates
- Confidence Shocks
- Income Taxes

Additive Forces
Restrictive Forces

- Economic models define the magnitudes and timing of market impacts flowing from policy changes or international shocks.
- Modern models begin with projections of 10-15 key domestic policies and global indicators.
- They then translate these into the consequences for prices, volumes, wages, and credit costs in 100+ specific markets.
## Simple Model of Real GDP Growth

<table>
<thead>
<tr>
<th>Variable</th>
<th>timing</th>
<th>math expression</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td></td>
<td></td>
<td>0.064</td>
<td>0.021</td>
<td>3.05</td>
</tr>
<tr>
<td>Potential Labor Force Growth</td>
<td>lag 1</td>
<td>@PCH(LCFE+LCFE(-1))</td>
<td>0.577</td>
<td>0.504</td>
<td>1.15</td>
</tr>
<tr>
<td>Bond Yield</td>
<td>lag 1</td>
<td>RMGFCM10NS(-1)</td>
<td>(0.006)</td>
<td>0.002</td>
<td>(3.30)</td>
</tr>
<tr>
<td>Real Oil Price Inflation</td>
<td>current</td>
<td>PCOF/CPI-PCOF(-1)/CPI(-1)</td>
<td>(0.002)</td>
<td>0.001</td>
<td>(2.30)</td>
</tr>
<tr>
<td>&quot;</td>
<td>lag 1</td>
<td>PCOF(-1)/CPI(-1)-PCOF(-2)/CPI(-2)</td>
<td>(0.001)</td>
<td>0.001</td>
<td>(1.13)</td>
</tr>
<tr>
<td>Real Exchange Rate Apprec.</td>
<td>lag 1</td>
<td>@PCH(REALEXCHIND(-1))</td>
<td>(0.093)</td>
<td>0.062</td>
<td>(1.50)</td>
</tr>
<tr>
<td>Real Export Growth</td>
<td></td>
<td>@PCH(EX96C)</td>
<td>0.122</td>
<td>0.073</td>
<td>1.67</td>
</tr>
<tr>
<td>Real &quot;G&quot; Growth</td>
<td></td>
<td>@PCH(GF/CPI)</td>
<td>0.401</td>
<td>0.132</td>
<td>3.04</td>
</tr>
<tr>
<td>% Point Change in Tax Rate</td>
<td>lag 1</td>
<td>TGF(-1)/GDP(-1)-TGF(-2)/GDP(-2)</td>
<td>(1.583)</td>
<td>0.453</td>
<td>(3.50)</td>
</tr>
<tr>
<td>Real Stock Mkt Growth</td>
<td>lag 1</td>
<td>@PCH(JSAPNS(-1)/CPI)</td>
<td>0.035</td>
<td>0.025</td>
<td>1.37</td>
</tr>
</tbody>
</table>

special shock: tax reform        |        | DTAXREFORM                   | -5%         | 0.018      | (2.87)      |
special shock: Gulf War           |        | DGULFWAR                      | -4%         | 0.012      | (3.29)      |

R-squared                        |        | 0.84772                      |             |            |             |
Adjusted R-squared               |        | 0.718868                     | S.D. dependent var |
S.E. of regression               |        | 1.1%                         |             |            |             |

Source: US Bureau of Economic Activity, Parthenon analysis
Forecasting Economic Forces

The Economic Factors Controlling Growth are Understood

10 Key Forces Controlling GDP Growth

- Supply “potential”
  - Growth in labor force and working age population
  - Growth in productivity due to technological advances
- Government budgets
  - Growth in purchases
  - Changes in tax rates
- Financial markets
  - Federal Reserve rates
  - Stock and bond market reactions
- International events and policies
  - Export growth
  - Changes in manipulated commodity prices (e.g. oil)
  - Changes in foreign exchange value of dollar
  - Extreme consumer confidence shocks from conflict and turmoil

Source: US Bureau of Economic Activity, Parthenon analysis
The Forces Creating Macroeconomic Cycles

Oil Shocks

- Real GDP Growth
- Oil Prices
- Iraq War

Percent of Total

% 0.0% 2.0% 4.0% 6.0% 8.0%


Real GDP Growth
Oil Prices
Iraq War
The Forces Creating Macroeconomic Cycles

Demographic Forces

Real GDP Growth
Core Labor Force Growth

Percent of Total

(4.0%) (2.0%) 0.0% 2.0% 4.0% 6.0% 8.0%

The Forces Creating Macroeconomic Cycles

Finance Factors

Real GDP Growth
Sum
Stock Market
Bond Rates

Percent of Total

(4.0%)
(2.0%)
0.0%
2.0%
4.0%
6.0%
8.0%

The Forces Creating Macroeconomic Cycles

International Trade Factors

- Real GDP Growth
- Sum
- Exports
- Exchange Rate

Percent of Total

Year:
- 1976
- 1977
- 1978
- 1979
- 1980
- 1981
- 1982
- 1983
- 1984
- 1985
- 1986
- 1987
- 1988
- 1989
- 1990
- 1991
- 1992
- 1993
- 1994
- 1995
- 1996
- 1997
- 1998
- 1999
- 2000
- 2001

Real GDP Growth
Sum
Exports
Exchange Rate

-4% 0% 2% 4% 6% 8%
The Forces Creating Macroeconomic Cycles

Federal Government Roles

- Real GDP Growth
- Tax Reform & Budget Shock
- Sum
- Tax Rate Changes
- Federal Purchases

Percent of Total

Real GDP Growth vs. Other Factors
The Forces Creating Macroeconomic Cycles

Federal Policy Summary

- Real GDP Growth
- Total Federal
- Fiscal
- Financial
The Forces Creating Macroeconomic Cycles

- Before 2001, some observers thought the business cycle was dead

- It wasn’t dead, just fitfully sleeping

- The “nirvana” or “goldilocks” economy of recent years was due to:
  - Unusually stable federal government and Federal Reserve policies
  - A serendipitous balance of international forces

- The private sector follows the wave-makers; it does not lead or cause the cycles

- Whenever the “wave makers” once again create coincident forces, a major business cycle does re-appear
The Forces Creating Macroeconomic Cycles

The Wave Makers Were Either Benign or Offsetting
Real World Example:
Explanations for Management and Investors Provided in September 2001

Recovery 2002

Economic Fundamentals

& Corporate Performance

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Economic Fundamentals
& Corporate Performance

• An Outlook Neither as Grim nor Unpredictable as Feared
  - A Trustworthy Framework of Analysis
  - The Economy Before & After September 11

• Benchmarks for Corporate Performance
  - True Drivers of Share Prices
  - Realistic Profit Expectations:
    • Macroeconomic Boundaries
    • Microeconomic Opportunities
An Old Recession in the New Economy

• **Traditional causes:**
  - Stock market bubble
  - OPEC-bred crisis
  - Fed tightening
  - Consumer responses
  - Business reactions

• **New dimensions:**
  - Tame inflation
  - Federal budget surplus available for stimulus
  - Many jobs unfilled
  - Ongoing technological revolutions (productivity & inventory issues)
Economic Fundamentals

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“Old” Recession Cyclical Patterns

- Interest Rates
- Share Prices
- Employment
- Capital Spending
- GDP and Industrial Output
- Housing and Autos
- Housing and Autos

1999 - 2002

Today
Capital Spending Cycles are Always Greater and Later than GDP

Note: Right (Cap. Ex.) Scale = 3x Left (GDP) Scale

All growth rates measure actual spending minus economy-wide inflation are measured by the GDP price index.
Capital Spending Cycles are Always Greater and Later than GDP

Note: Right (Cap. Ex.) Scale = 3x Left (GDP) Scale

All growth rates measure actual spending minus economy-wide inflation are measured by the GDP price index.
Economic Fundamentals
& Corporate Performance

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This Should Have Been a Mild Recession

Interest Rates Began Falling in Early 2000

Real GDP Growth, right scale

10-Year Treasury Bond Yield, 1 Year Earlier, left scale
### Forecasting Economic Forces

**Pre-September 11th – Policy Set to Neutralize Shocks**

#### Ultimate Magnitude of GDP Impacts ($Billion)

<table>
<thead>
<tr>
<th>Shocks and Policy Responses</th>
<th>Equity Values</th>
<th>High-Tech Capital Spending</th>
<th>Consumer Energy Costs</th>
<th>Cost of capital (Bond rates)</th>
<th>Personal Tax Cuts</th>
<th>Extra Federal Spending</th>
<th>Total Disturbances to Normal Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1999-2000 Changes</strong></td>
<td>62</td>
<td>163</td>
<td>(70)</td>
<td>(39)</td>
<td>-</td>
<td>-</td>
<td>116</td>
</tr>
<tr>
<td><strong>2000-2001 Changes</strong></td>
<td>(226)</td>
<td>(99)</td>
<td>(26)</td>
<td>102</td>
<td>111</td>
<td>18</td>
<td>(120)</td>
</tr>
<tr>
<td><strong>Total: 1999-2001</strong></td>
<td>(164)</td>
<td>65</td>
<td>(96)</td>
<td>63</td>
<td>111</td>
<td>18</td>
<td>(4)</td>
</tr>
</tbody>
</table>

**Total Size as % of US GDP**

-1.6%  0.7%  -1.0%  0.6%  1.1%  0.1%  0.0%

The tax cuts complemented earlier Federal Reserve actions to create a powerful stimulus almost perfectly offsetting the negative shocks.

Source: Parthenon analysis
### Estimating the Impacts: Equity Example

<table>
<thead>
<tr>
<th>Equity Value Shock</th>
<th>Analytical Basis of Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss in Net Worth</td>
<td>% Directed to Spending</td>
</tr>
<tr>
<td>1999-2000 Shock</td>
<td>827</td>
</tr>
<tr>
<td>2000-2001 Shock</td>
<td>-3016</td>
</tr>
<tr>
<td>Total: 1999-2001</td>
<td>-2190</td>
</tr>
<tr>
<td>Total Size as % of US GDP</td>
<td>-164</td>
</tr>
</tbody>
</table>

1999-2000 Shock: \(62 = 827 \times 3\% \times 2.5\)

2000-2001 Shock: \((226) = -3016 \times 3\% \times 2.5\)

Total: 1999-2001: \((164) = -2190 \times 3\% \times 2.5\)

Total Size as % of US GDP: \(-1.6\% = -164 \) divided by $10 trillion dollar economy
Forecasting Economic Forces

Economic Forecast PRIOR to September 11th

Policy & Psychology Forces Setting up 2002

Federal Funds: Each 1% reduction = +.5% GDP Impact
Consumer Sentiment: Each 10% gain = +.7% GDP Impact

Source: Parthenon analysis, DRI-WEFA
Scaling the Terrorist Economic Shock and Impacts

• At least two major, prior shocks to our economic and personal security were arguably the same order of magnitude as September 11

  - The original OPEC oil embargo in 1973 revealed for the first time since WWII an immense American vulnerability.

  - The 1990-91 Gulf War threatened not only energy supplies but the lives of 500,000 military men and women.

• Then, as now, consumers abruptly scaled back discretionary spending.

• The policy responses in the past were either sharply counter-productive or absent.
Global Shocks Involving Transformed US Situations:

The First OPEC Shock

The Federal Reserve aggressively fights inflation & intensifies the recession

Consumers fearful: Crude oil price jumps From $3 to $12

The OPEC and Fed actions doomed the US to 15 months of recession
In spite of a huge initial decline in consumer sentiment, a decisive victory in the air war plus late Fed stimulus limit the recession to 9 months.
The Economy Before Sept 11

In spite of a huge initial decline in consumer sentiment, a decisive victory in the air war plus late Fed stimulus limit the recession to 9 months.
The September 11 Terrorist Attack

In spite of a huge initial decline in consumer sentiment, a decisive victory in the air war plus late Fed stimulus limit the recession to 9 months.
Forecasting Economic Forces

Post-September 11th – Terrorist Actions and Policy Responses

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>New Shocks Estimates</td>
<td>0</td>
<td>-</td>
<td>25</td>
<td>35</td>
<td>60</td>
<td>125</td>
<td>-50</td>
<td>-95</td>
<td>100</td>
</tr>
</tbody>
</table>

Ultimate Magnitude of GDP Impacts ($Billion)

The federal tax cuts, new emergency spending needs, and Federal Reserve actions are powerful stimuli, fully offsetting the negative shocks.
The Federal Reserve and all global central banks pour in extra liquidity; Congress and the President add perhaps $100 billion in fiscal stimulus.