Business Cycle Measurement

ECO 305: Intermediate Macroeconomics
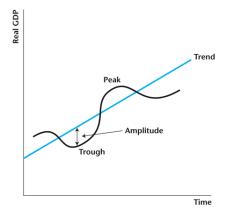
1 Introduction

1.1 Goals/Reading

Goals / Reading

- Specific Goals:

  - Identify regularities (and irregularities) in macroeconomic activity.
  - Identify comovement in macroeconomic variables.
  - Describe the behavior of key macroeconomic variables.

- Reading: Williamson, Chapter 3.

1.2 Business Cycle Fluctuations

Business Cycle Fluctuations

- **Business Cycle:** fluctuations around a trend in economic activity.

- **Peak:** a turning point in a business cycle at a large positive deviation from the trend.

- **Trough:** a turning point in a business cycle at a large negative deviation from the trend.

1.3 GDP Fluctuations

GDP Deviations from Trend

- **Real GDP**: A measure of the *quantity* of all final goods and services produced.

- **Potential GDP**: Value of real GDP if all factors of production are used efficiently. Trend GDP.

- **Output gap:** Percentage deviation of real GDP from potential.

- **Recessionary gap:** output gap that is negative.

- **Inflationary gap:** output gap that is positive.
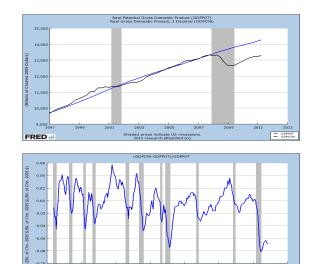
GDP Deviations from Trend

Top graph:

- Blue: Potential GDP
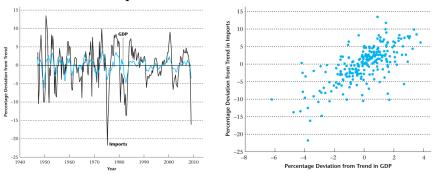
- Black: Real GDP

Bottom graph:

- Output gap.

http://research.stlouisfed.org/fred2

2 Comovement

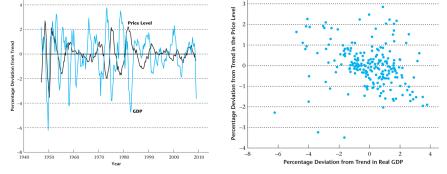## 2.1 Cyclicality

Comovement

- **Procyclical:** A variable is procyclical if its deviations from trend are positively correlated with the output gap.

- **Countercyclical:** A variable is countercyclical if its deviations from trend are negatively correlated with the output gap.

- **Acyclical:** A variable is acyclical if it is *not procyclical nor countercyclical.*

Comovement of Imports and GDP

Are imports are procyclical, countercyclical, or acyclical?

Comovement of Price Level and GDP

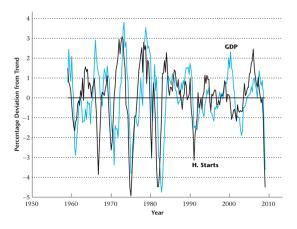Is price level procyclical, countercyclical, or acyclical?

2.2 Leading and lagging variables

Leading and Lagging Variables

- **Leading:** A variable is leading when it tends to predict upcoming movements in real GDP.

- **Lagging:** A variable is lagging when it tends to follow recent movements in real GDP.

- **Coincident:** A variable is a coincident variable when it is positively correlated with GDP, but not leading or lagging.

- **Leading Economic Indicators:** An index comprised of several leading economic variables, constructed using statistical forecasting techniques.

  – Conference Board's Index of Leading Economic Indicators.
  – Federal Reserve Bank of Philadelphia State and National Leading Indices.
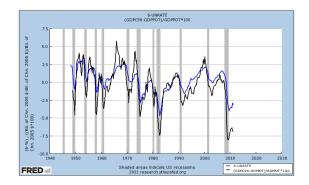
2.3 Examples

Housing Starts
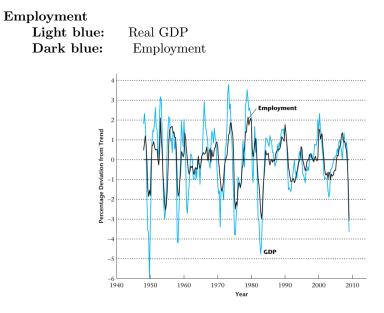|	
Light blue:	Real GDP
Dark blue:	Housing Starts

Is 'Housing Starts' a *leading*, *lagging*, or *coincident* economic variable?

Unemployment Rate
Blue Line: Unemployment rate: deviation from mean, multiplied by -1.
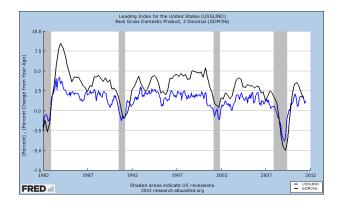**Black Line:** Output gap.

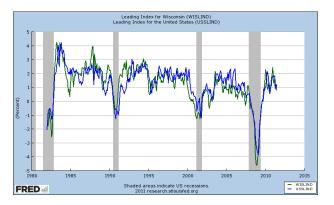Is the unemployment rate a *leading, lagging,* or *coincident* economic variable?

Employment
    Light blue: Real GDP
    Dark blue: Employment

Is 'Employment' a *leading, lagging,* or *coincident* economic variable?

FRB Philadelphia National Leading Index
    Blue Line: Leading Index
    Black Line: Real GDP Growth

FRB Philadelphia Wisconsin Leading Index
    Blue Line: National Leading Index
    Green Line: Wisconsin Leading Index
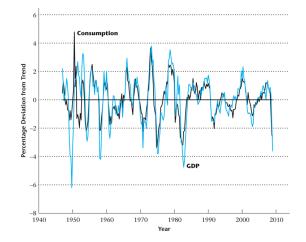

3 Volatility

3.1 Measure of variance

Volatility

- **Volatility** is a description of how much a variable deviates from its trend.

- Volatility is the opposite of stability.

- Typically measured by the variance of the variable's standard deviation from trend, as a ratio of the standard deviation of the output gap.
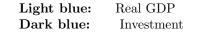
3.2   Consumption

Consumption Volatility
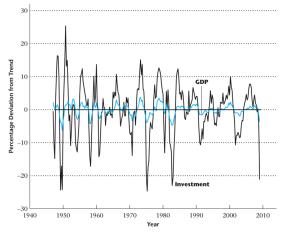   **Light blue:**   Real GDP
    Dark blue: Consumption

Consumption Volatility = 75%.

3.3   Investment

Investment Volatility
    Light blue: Real GDP
    Dark blue: Investment

Investment Volatility = 473%.

4

4.1   Coming up!

Coming Up!

- Next class: One-period model of the macroeconomy.

- Please read Chapter 4!

- Homework due Tuesday, Sept 13: Williamson, Chapter 3 problems: 2-6.

    - Convert any Word documents to PDF.
    - File name convention: lastname_firstname_hw1.pdf.
    - Type up answers and upload to D2L dropbox.