

Business Cycle Measurement

ECO 305: Intermediate Macroeconomics

1 Introduction

1.1 Goals/Reading

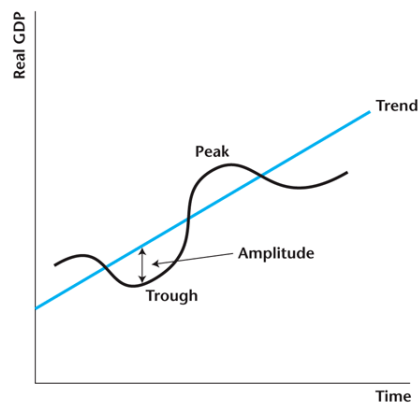
Goals / Reading

- Specific Goals:
 - Identify regularities (and irregularities) in macroeconomic activity.
 - Identify co-movement 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.

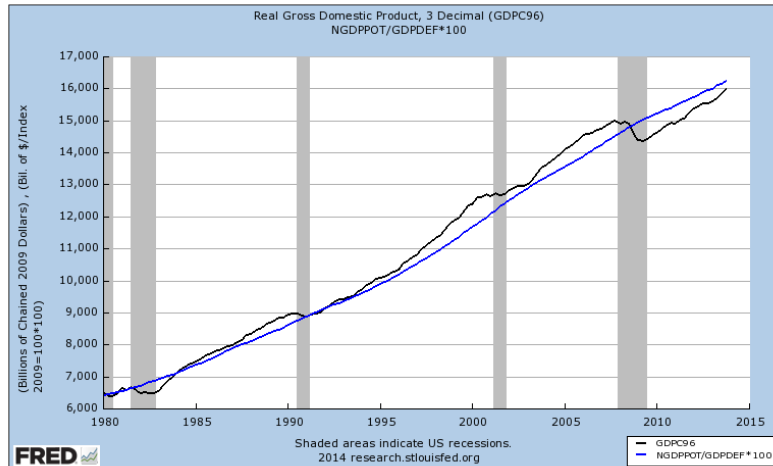


1.3 GDP Fluctuations

GDP Deviations from Trend

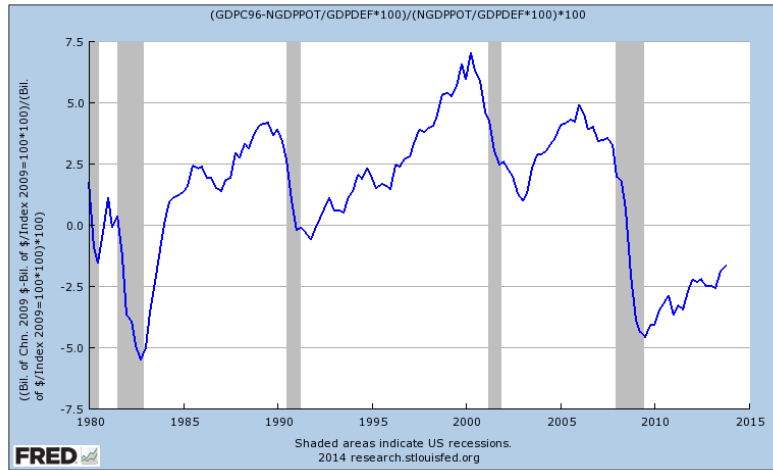
- **Real GDP:** A measure of the *quantity* of all final goods and services produced.
- **Potential GDP:** Value of real GDP if all factors of production are used efficiently. Trend GDP.
- **Output gap:** Percentage deviation of real GDP from potential.
- **Recessionary gap:** output gap that is negative.
- **Inflationary gap:** output gap that is positive.

Real GDP versus Potential GDP



<http://research.stlouisfed.org/fred2>

Output Gap



<http://research.stlouisfed.org/fred42>

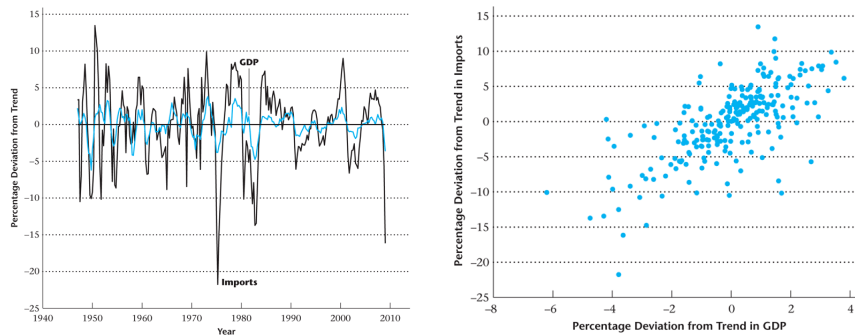
2 Co-movement

2.1 Cyclicality

Co-movement

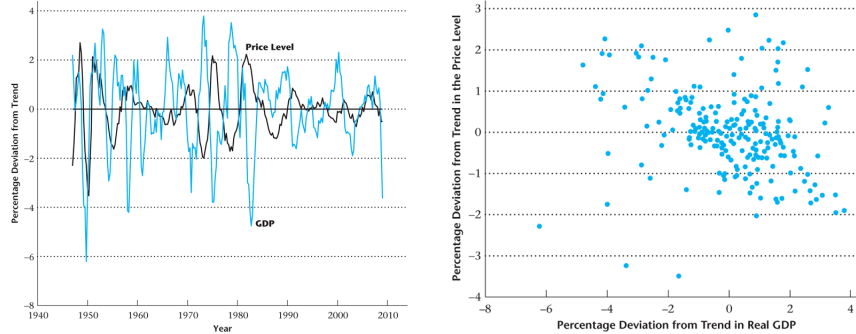
- **Procyclical:** A variable is procyclical if its deviations from trend are positively correlated with the output gap.
- **Countercyclical:** A variable is countercyclical if its deviations from trend are negatively correlated with the output gap.
- **Acyclical:** A variable is acyclical if it is *not procyclical nor countercyclical*.

Co-movement of Imports and GDP



Are imports are procyclical, countercyclical, or acyclical?

Co-movement of Price Level and GDP



Is price level procyclical, countercyclical, or acyclical?

2.2 Leading and lagging variables

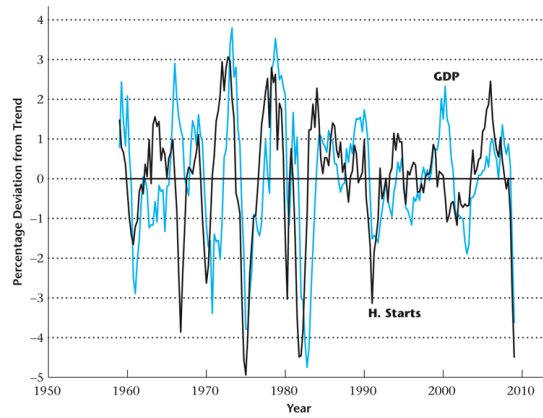
Leading and Lagging Variables

- **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

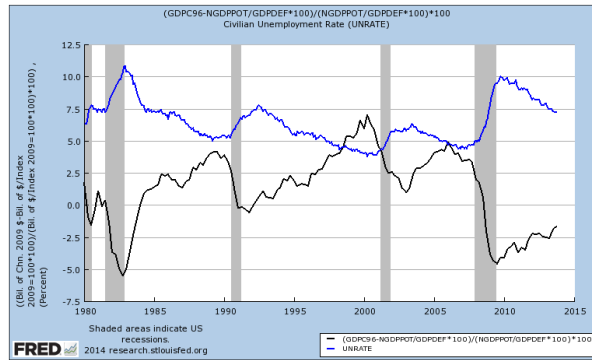
- Light blue: Real GDP
- Dark blue: Housing Starts



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

Unemployment Rate

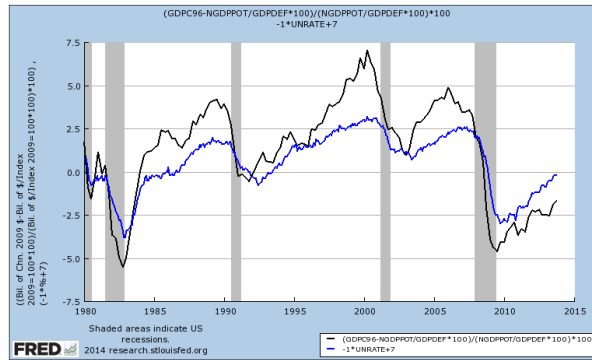
Blue Line: Unemployment rate **Black Line:** Output gap.



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

Unemployment Rate

Blue Line: Unemployment rate (multiplied by -1, scaled 7 percentage points). **Black Line:** Output gap.

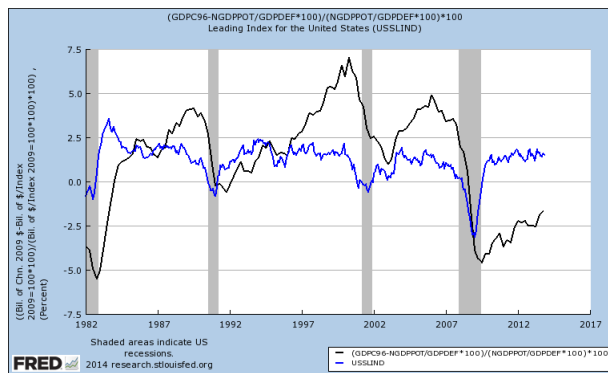


Is the unemployment rate a *leading*, *lagging*, or *coincident* economic variable?

FRB Philadelphia National Leading Index

Blue Line: Leading Index

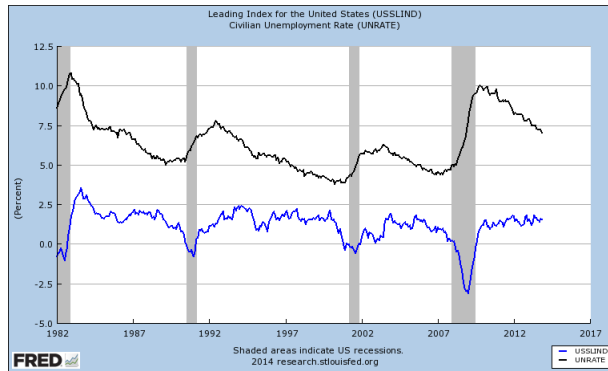
Black Line: Real GDP Growth



FRB Philadelphia National Leading Index

Blue Line: Leading Index

Black Line: Unemployment Rate



3 Volatility

3.1 Measure of variance

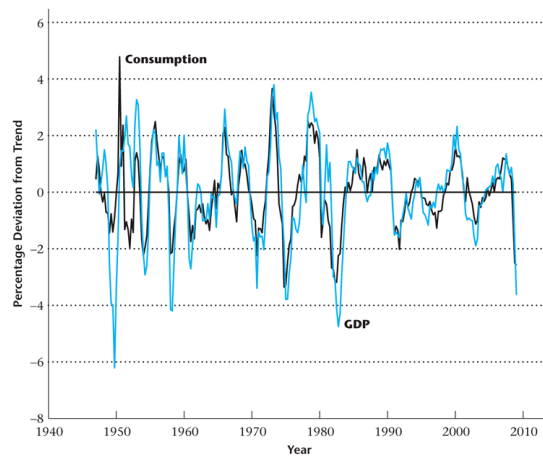
Volatility

- **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 deviation from its trend, as a ratio of the variance of the output gap.

3.2 Consumption

Consumption Volatility

Light blue: Real GDP
Dark blue: Consumption

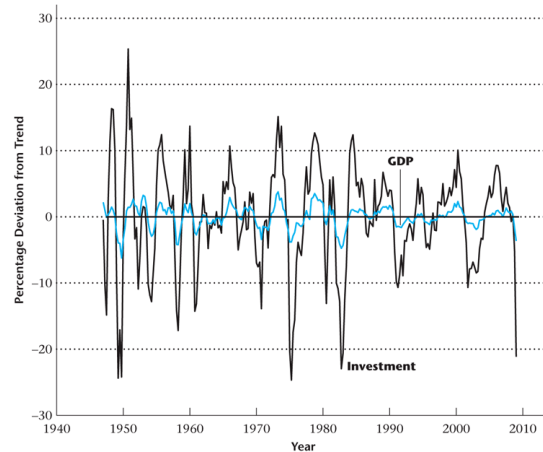


Consumption Volatility = 75%.

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 Thursday, February 5
 - Convert any Word documents to PDF.
 - Type up answers and upload to D2L dropbox.