

Business Cycle Measurement

ECO 305: Intermediate Macroeconomics

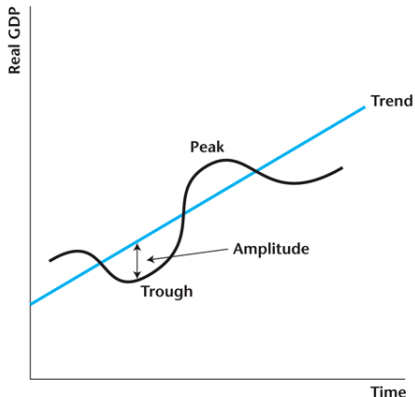
Goals / Reading

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- 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.

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.



GDP Deviations from Trend

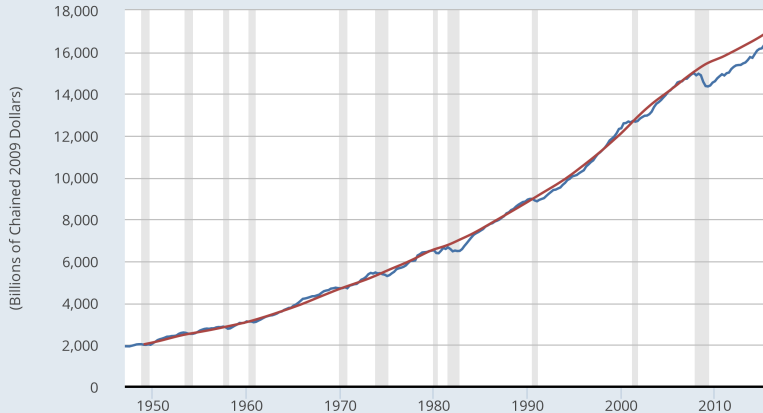
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- **Real GDP:** A measure of the *quantity* of all final goods and services produced.
- **Potential GDP:** Value of real GDP if all factors of production are used efficiently. Trend GDP.
- **Output gap:** Percentage deviation of real GDP from potential.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

Real GDP versus Potential GDP



— Real Gross Domestic Product, 3 Decimal
— Real Potential Gross Domestic Product



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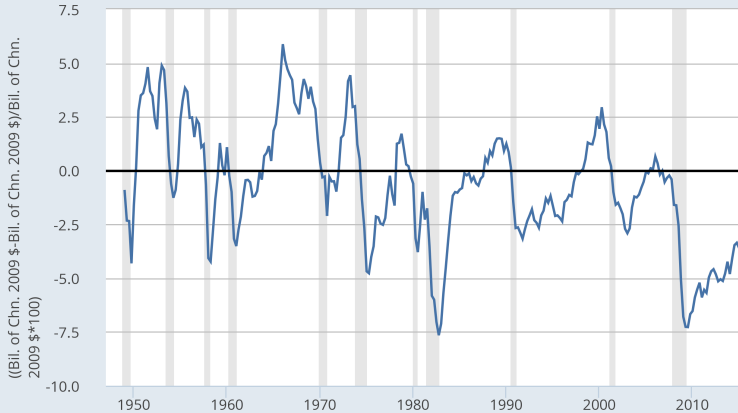
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Output Gap

FRED 

— $(\text{Real Gross Domestic Product} - \text{Real Potential Gross Domestic Product}) / \text{Real Potential Gross Domestic Product} * 100$



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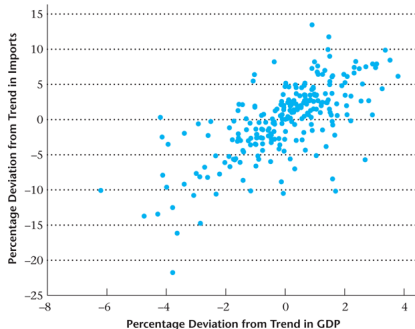
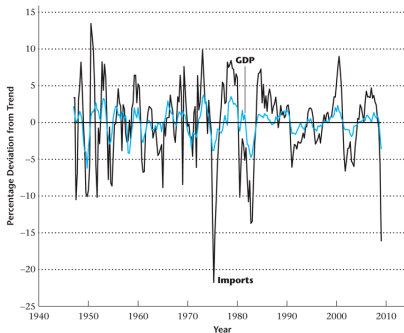
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Co-movement

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- **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*.

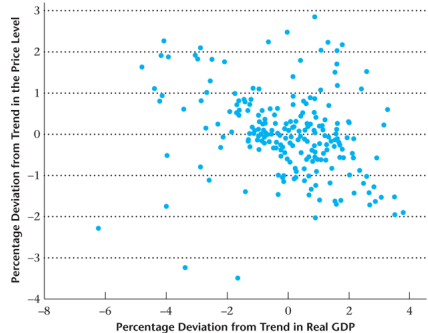
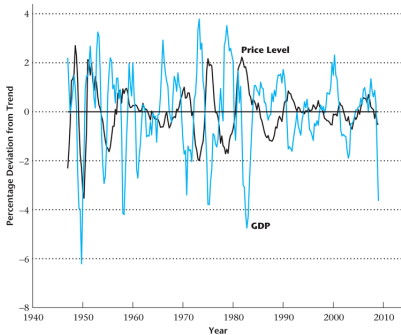
Co-movement of Imports and GDP



Are imports are procyclical, countercyclical, or acyclical?

Co-movement of Price Level and GDP

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Is price level procyclical, countercyclical, or acyclical?

Leading and Lagging Variables

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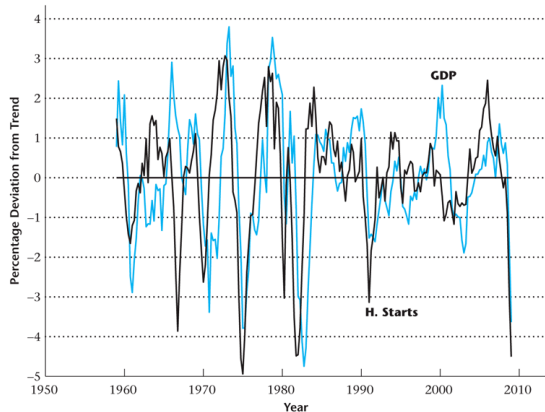
- **Leading:** A variable is leading when it tends to predict upcoming movements in real GDP.
- **Lagging:** A variable is lagging when it tends to follow recent movements in real GDP.
- **Coincident:** A variable is a coincident variable when it is positively correlated with GDP, but not leading or 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.

Housing Starts

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Light blue:
Real GDP

Dark blue:
Housing Starts



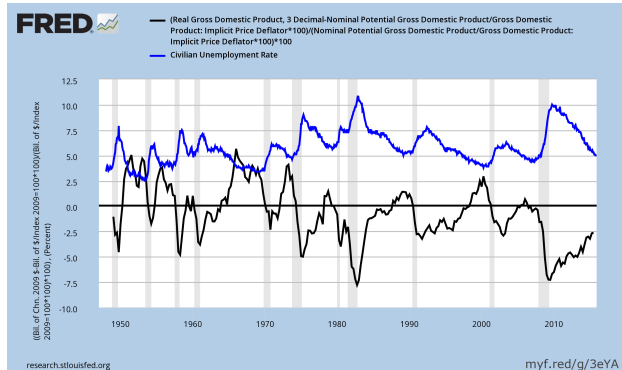
Is 'Housing Starts' a *leading*, *lagging*, or *coincident* economic variable?

Unemployment Rate

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Blue Line:
Unemployment
rate

Black Line:
Output gap.



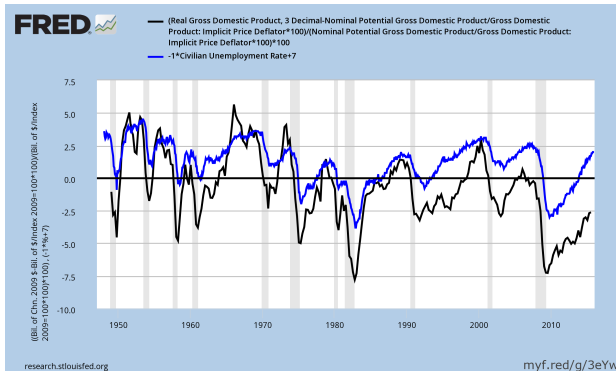
Is the unemployment rate a *leading*, *lagging*, or *coincident* economic variable?

Unemployment Rate

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

Black Line:
Output gap.

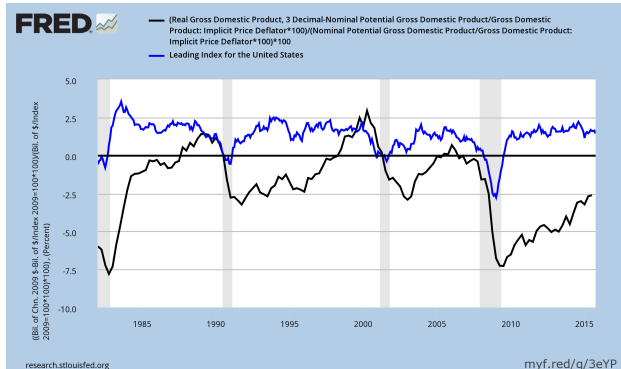


Is the unemployment rate a *leading*, *lagging*, or *coincident* economic variable?

FRB Philadelphia National Leading Index

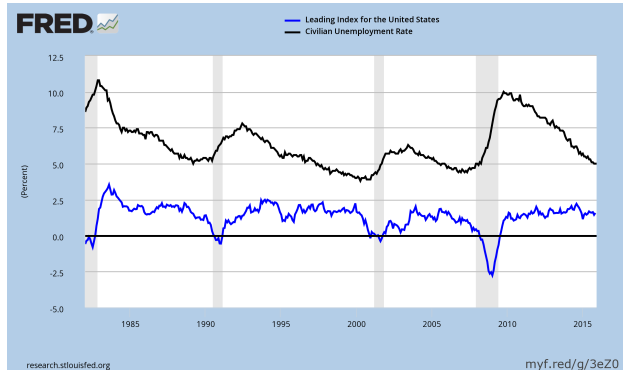
Blue Line:
Leading Index

Black Line:
Real GDP Growth



FRB Philadelphia National Leading Index

Blue Line:
Leading Index
Black Line:
Unemployment
Rate

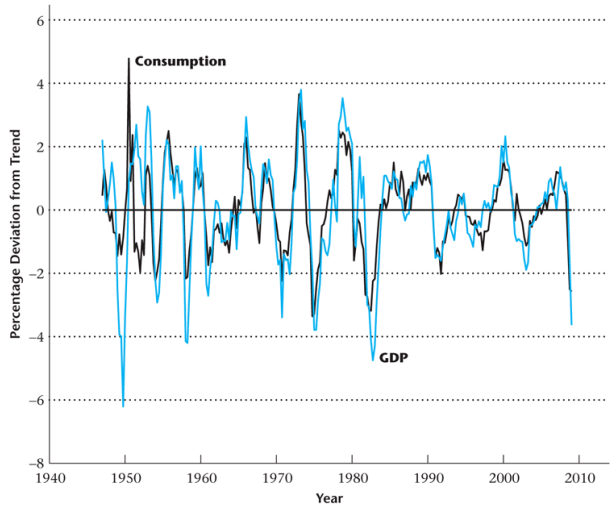


Volatility

- **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.

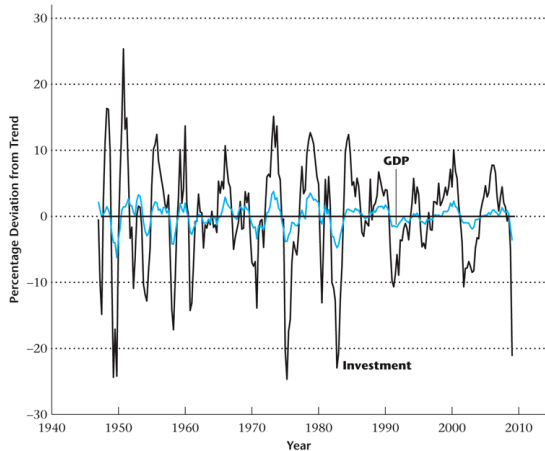
Consumption Volatility

Light blue:
Real GDP
Dark blue:
Consumption



Investment Volatility

Light blue:
Real GDP
Dark blue:
Investment



Investment Volatility = 473%.

Coming Up!

- Next class: One-period model of the macroeconomy.
- Read Chapter 4
- Homework
 - Convert any Word documents to PDF.
 - Type up answers and upload to D2L dropbox.