

# Chapter 3

## Business Cycle Measurement

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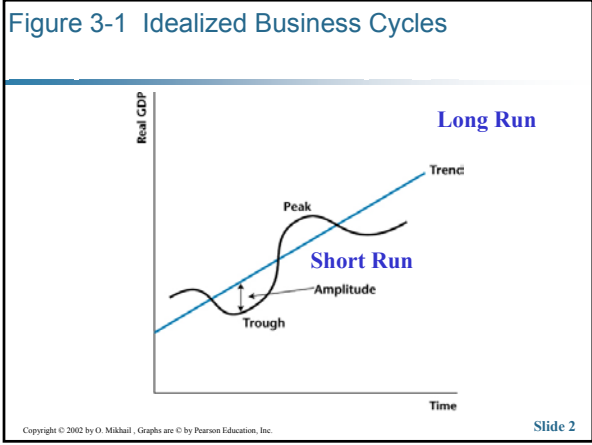
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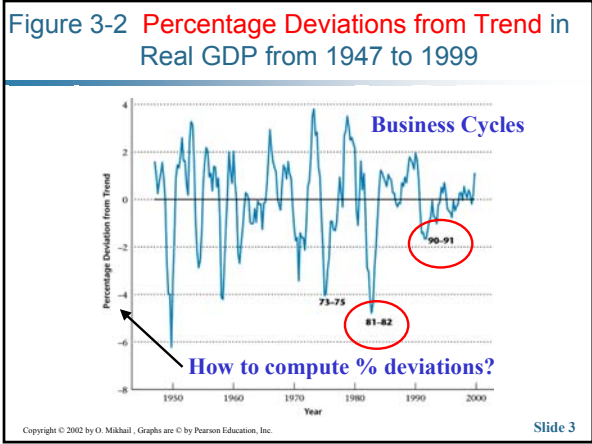
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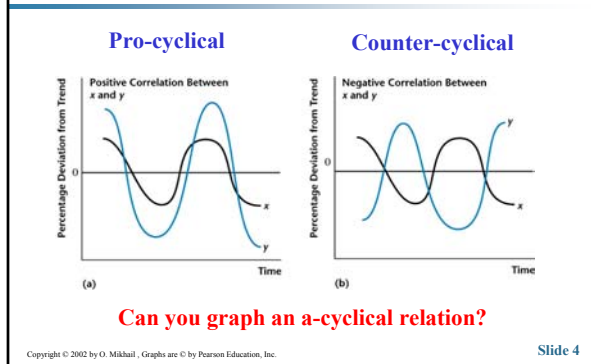
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Figure 3-3 Business Cycle Vocabulary



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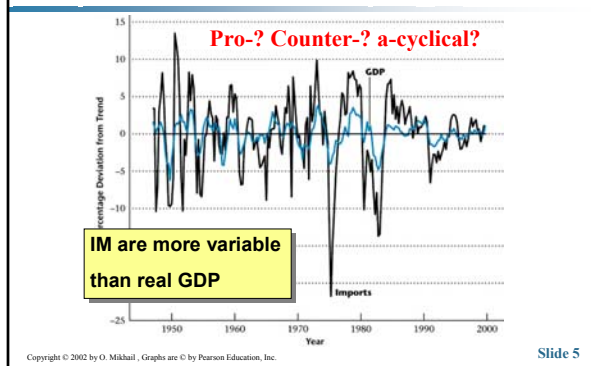
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Figure 3-5 Imports and GDP



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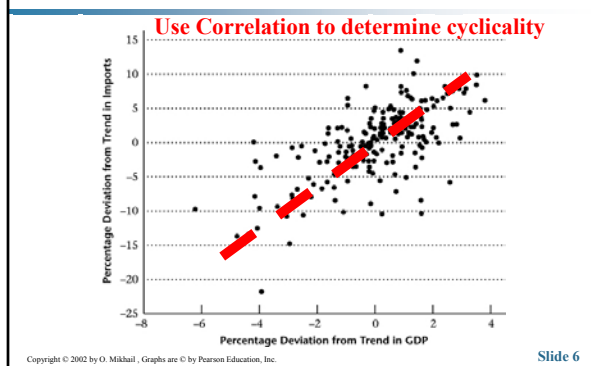
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Figure 3-6 Scatter Plot of Imports and GDP



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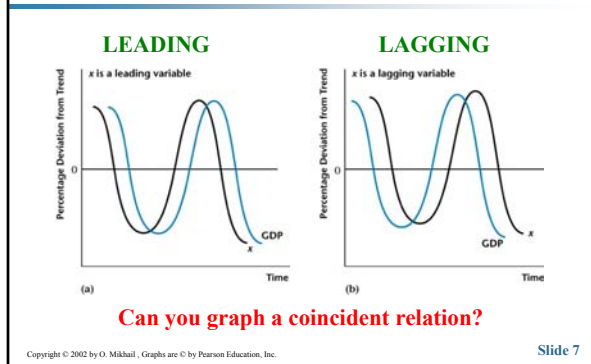
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Figure 3-7 Leading and Lagging Variables




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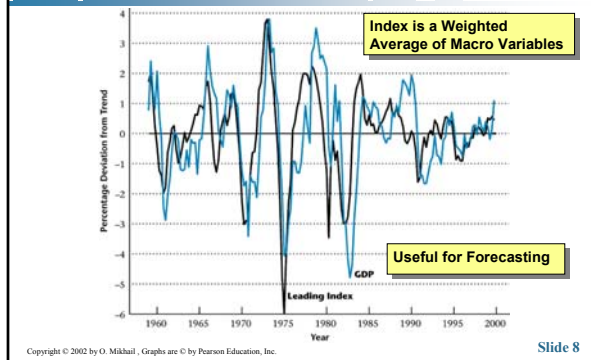
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Figure 3-8 Percentage Deviations from Trend in Real GDP (colored line) and the **Index of Leading Economic Indicators** (black line) for the Period 1959-1999




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**Key Variables and Empirical Regularities**  
**Business Cycle Facts**

- For each variable, study its properties:
  - Procyclical, countercyclical or acyclical.
  - Leading or lagging.
  - More or less variable relative to real GDP.
- Variables of interest:  
C, I, P, M<sup>s</sup> and E.

↑  
← P: Implicit Price Deflator

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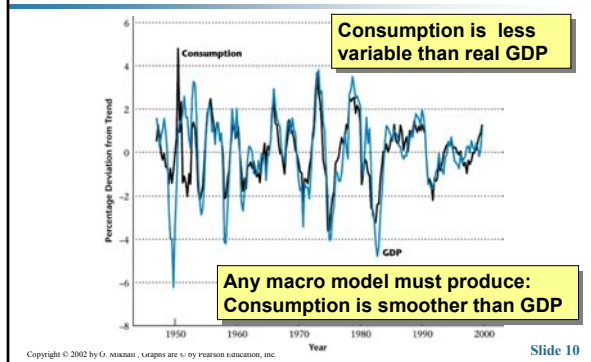
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Figure 3-9 Percentage Deviations from Trend in Real Consumption (black line) and Real GDP (colored line)




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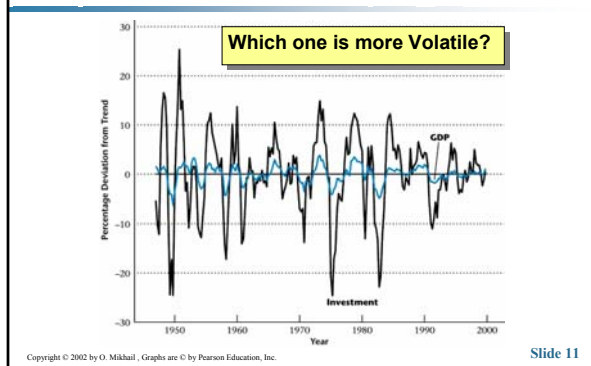
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Figure 3-10 Percentage Deviations from Trend in Real Investment (black line) and Real GDP (colored line)




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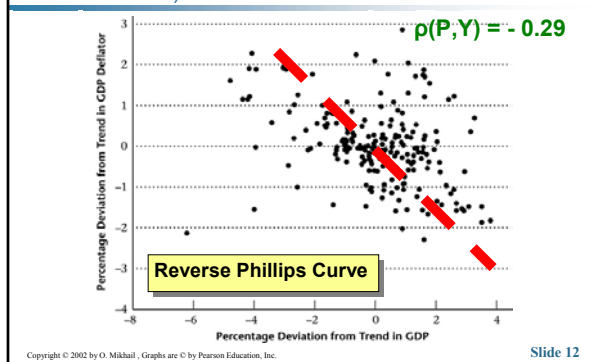
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Figure 3-11 Scatter Plot for the Percentage Deviations from Trend in the Price Level (the Implicit GDP Price Deflator) and Real GDP




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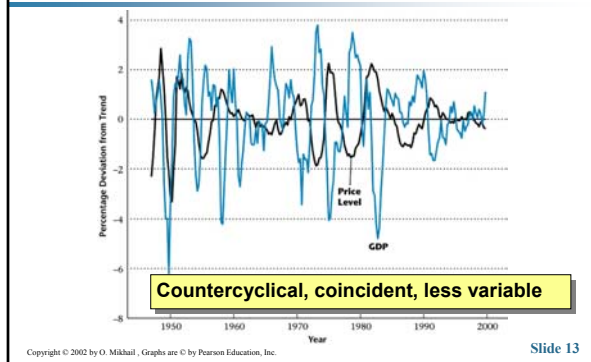
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Figure 3-12 Price Level and GDP



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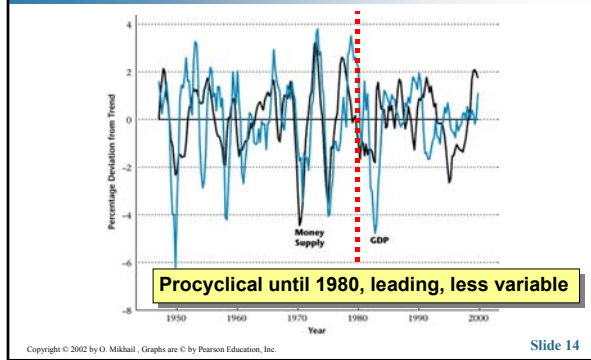
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Figure 3-13 Percentage Deviations from Trend in the Money Supply (black line) and Real GDP (colored line) for the Period 1947-1999



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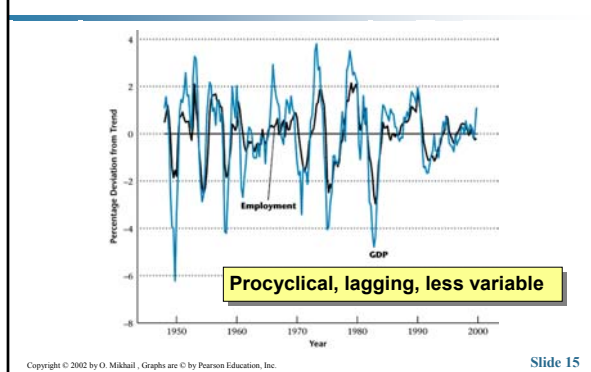
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Figure 3-14 Percentage Deviations from Trend in Employment (black line) and Real GDP (colored line)



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### Table 3-1 Cyclicality and Volatility

**Table 3.1 Correlation Coefficients and Variability of Percentage Deviations From Trend**

	Correlation Coefficient (GDP)	Std. Dev. (% of S.D. of GDP)
Consumption	0.76	76.1%
Investment	0.84	464.4
Price Level	-0.29	56.2
Money Supply	0.37	77.9
Employment	0.80	58.7

Cyclicality

Volatility

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Slide 16

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### Table 3-2 Empirical Regularities

#### Empirical Regularities (Stylized Facts)

**Table 3.2 Summary of Business Cycle Facts**

	Cyclicality	Lead/Lag	Variability Relative to GDP
Consumption	Procyclical	Coincident	Smaller
Investment	Procyclical	Coincident	Larger
Price Level	Countercyclical	Coincident	Smaller
Money Supply	Procyclical	Leading	Smaller
Employment	Procyclical	Lagging	Smaller
Real Wage	Procyclical	?	—

Can you propose a model that generates these facts?

Behavior is crucial to discriminate between different theories in Chapters 10 and 11

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Slide 17

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### ASSIGNMENT III

- Consider the following data, which are observations on x and y over several periods of time:

Period	X	Y
1	100	500
2	200	500
3	200	1000
4	100	1000
5	50	500
6	50	250
7	100	250

- Construct a scatter plot of y against x. (Hint: similar to Slides 6 and 12) Is y pro-, or counter-cyclical with respect to x?
- Graph the time series of x and y (on the same graph). (Hint: Similar to Slide 5) Is y a leading, lagging, or coincident variable with respect to x?

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Slide 18

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