Topics for Today

1.) Defining Business Cycles

2.) Characteristics of Business Cycles

3.) A Preliminary Analysis of Business Cycles
   - Aggregate Demand/Aggregate Supply
   - Keynesians vs. Classical
"In the long-run we are all dead. Economists set themselves too easy, too useless a task if in tempestuous seasons they can only tell us that when the storm is passed the ocean is flat again."

—John Maynard Keynes (1923)
Real GDP Growth in Canada and the United States

In Canada the growth rate in real GDP averages around 3.1 percent per year, as indicated by the green line in Panel (a). But there is a wide variation around this average. Recessions are periods during which real GDP falls—that is, during which real GDP growth is negative. U.S. GDP is shown in Panel (b). Clearly business cycles in the two economies are closely connected. But the state of the U.S. economy is not the only important thing for Canada.

Figure 9.8
Cyclical behaviour of the unemployment rate
The unemployment rate is countercyclical and very sensitive to the business cycle. It rises rapidly in contractions but falls more slowly in expansions.
Source: monthly unemployment rate, seasonally adjusted; Canadian Economic Observer, Statistical Summary or CANSIM D980745.

Figure 9.9
Cyclical behaviour of average labour productivity
Average labour productivity, measured as real output per person employed, is procyclical and leading.
Source: monthly GDP at factor cost and monthly employment, both seasonally adjusted; Canadian Economic Observer, Statistical Summary or CANSIM i56001 and D980595.
Cyclical behaviour of industrial production

Industrial production, an aggregate of production in all industries, is procyclical and coincident with the business cycle. The peaks and troughs of the business cycle are shown by the vertical lines $P$ and $T$. The shaded areas represent recessions.

Source: monthly industrial production, seasonally adjusted: Canadian Economic Observer, Statistical Summary or CANSIM 156010.

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Cyclical behaviour of consumption and investment

Both consumption and investment are procyclical. However, investment is more sensitive than consumption to the business cycle, reflecting the fact that durable goods are a larger part of investment spending than they are of consumption spending.

Source: consumption and business fixed investment, real, quarterly, and seasonally adjusted: Canadian Economic Observer, Statistical Supplement or CANSIM D15372 and D14851.
Table 9.1 Canadian Business Cycle
Turning Points and Durations

<table>
<thead>
<tr>
<th>Trough</th>
<th>Expansion (Months from Trough to Peak)</th>
<th>Peak</th>
<th>Contraction (Months from Peak to Next Trough)</th>
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<tr>
<td>May 1879</td>
<td>38</td>
<td>Nov. 1873</td>
<td>66</td>
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<td>Mar. 1885</td>
<td>23</td>
<td>July 1882</td>
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<td>29</td>
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<td>July 1890</td>
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<td>Aug. 1896</td>
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<td>Aug. 1895</td>
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<td>22</td>
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<td>Mar. 1910</td>
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<td>Jan. 1915</td>
<td>36 (WWI)</td>
<td>Nov. 1912</td>
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<td>Apr. 1919</td>
<td>14</td>
<td>Jan. 1918</td>
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<td>June 1920</td>
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<td>June 1923</td>
<td>14</td>
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<td>Mar. 1933</td>
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<td>Apr. 1929</td>
<td>47 (Depression)</td>
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<td>Oct. 1938</td>
<td>80 (WWII)</td>
<td>June 1945</td>
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<td>Oct. 1948</td>
<td>11</td>
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<td>Sep. 1949</td>
<td>44 (Korean War)</td>
<td>May 1953</td>
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<td>Apr. 1990</td>
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2 Key Questions

1.) What causes business cycles?

2.) How should government policy respond to business cycles?
Characteristics of Business Cycles

1.) Comovement. "Business cycles are all alike."

2.) Recurrent but not periodic

3.) Persistence
Measuring Business Cycles

Like technological progress and productivity, business cycles are usually measured as a residual.

\[
\text{Observed Output} = \text{Trend} + \text{Cycle} + \text{Seasonal}
\]
Structure of Business Cycle Theories

Business Cycles = Shocks + Propagation Mechanisms

- Oil prices
- Innovations
- Weather
- Govt. policy
- Wars
- Expectations?

- Installation lags
- Adjustment costs
- Inventories
- Consumption smoothing
- Fixed costs (Hysteresis)
- Decision lags

Reduced Form Model

\[ Y_t = a_1 Y_{t-1} + a_2 Y_{t-2} + \epsilon_t \]

\( \text{propagation} \)

\( \text{shock} \)
**The AD/AS Model**

**AD** : Combinations of \((P, Y)\) consistent with equilibrium in the goods and asset markets.

**AS** : Combinations of \((P, Y)\) consistent with equilibrium in the labor market.
Why Does AD slope down?

\[ Y \uparrow \implies \text{Demand for real balances} \left( M^*_p \right) \uparrow \]

\[ \implies \text{For a given } M, P \text{ must fall to maintain equilibrium in the money market} \]
A Simple Model of the AD Curve

Quantity Equation: \( MV = PY \)

If \( M \) and \( V \) are constant, then \( P \uparrow \Rightarrow Y \downarrow \)

\[ \text{AD} (V, M) \]

\( M \uparrow \Rightarrow \text{AD shifts right} \)

\( V \uparrow \Rightarrow \text{AD shifts right} \)
The Keynesian Model

Keynes: What if prices don't adjust?

Then supply adjusts to the given level of demand.

Output is demand determined
Business Cycles in the Keynesian Model
The Classical Model

Classical Model: Prices adjust to ensure AD equals the given AS. Output is determined by supply. Demand only affects the price level.

$$\text{AS: } Y = F(L, E)$$
Business Cycles in the Classical Model

![Graph showing Business Cycles in the Classical Model](image-url)
Initially, $M \uparrow \Rightarrow Y \uparrow$

After awhile, $P$ gradually rises and $Y \downarrow$. In the Long-Run, prices rises proportionally to $M \uparrow$, and output remains unchanged.
The Dilemma of AS Shocks

Dilemma: At point 2, do you stabilize output by increasing the $M^s$, which shifts out $AD$?

Or do you allow prices to gradually fall to their original level, but at the cost of a temporary recession?

Output Stabilization vs. Inflation Stabilization
The 1990s (?)

Positive Supply Shock lowers inflation and raises output. "Win/Win".
An Integrated View

Basic Keynesian Assumption

$Y > LRAS \implies$ Prices + Wages Rise
SRAS curve shifts up

$Y < LRAS \implies$ Prices + Wages Fall
SRAS curve shifts down