Lecture 12: 
Economic Fluctuations

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Short-Run Economic Fluctuations

- Economic activity fluctuates from year to year. In some years, the production of goods and services rises. In other years, normal growth does not occur, sometimes leading to recession.
- This is called the “Business Cycle”.
Long Run GDP

- If we were to plot real GDP over time, we would see a cyclical line representing actual GDP.
- Through this line we can define the long run trend of GDP, which represents the economy’s growth rate over the long term.
- Deviations from this trend represent the phases of the business cycle.
Long Run vs. Short Run

GDP

Long Run (trend)

Short Run (fluctuations from trend)

Time
Long Run GDP Level

- The trend represents the “long run” (LR) in the economy.
- LR real GDP grows on average at 2-3%, which is represented by the slope of the trend line.
- As we have seen previously, this growth rate is determined by long run growth in productivity.
As we have also seen previously, the potential output of the economy at a point in time is determined by:

- technology

- Factors of production available:
  - Labour Supply (L)
  - Capital (K)
  - Resources (R)

- Human capital workers have
  - Education
  - Health
Using the production function, in the long run we define *Potential GDP* as

\[ Y = A(L, K, R) \]

*Potential GDP* (Long Run or Trend GDP) is the point of reference used to compare the economy’s performance to. It describes long run real GDP possible given technology and factors of production available at a point in time. It also describes the real output the economy will tend toward.
Short-Run Economic Fluctuations

- Real GDP in the Short Run does not always equal Potential GDP.
- If actual Real GDP is above potential GDP, then we call such a period of time a “boom”.
- If Real GDP is below potential GDP, or if growth in real GDP slows, then we call such a period of time a “slowdown”.
- If Real GDP is falls for two consecutive quarters (6 mos.), then we call such a period of negative growth a “recession” (shaded areas on next diagram).
Figure 9-1: Real GDP Growth in the United States

- **Real GDP growth rate**
- **Average growth rate**

Percentage change from 4 quarters earlier

Year

Real GDP Growth in the United States

**Long Run vs. Short Run**

- The *long run* refers to a period of time long enough that *ALL prices can adjust* to some economic shock.
  - Output will tend to equal potential GDP assuming no other shock occurs.
- The *short run* refers to a period of time short enough such that *ALL prices do NOT adjust* to some economic shock.
  - Output usually differs from Potential GDP in the short run.
Three Key Facts About Economic Fluctuations

① Economic Fluctuations are Irregular and Unpredictable in occurrence and duration.
② Most Macroeconomic Variables Fluctuate Together
③ As Output Falls, Unemployment Rises
  ♦ Changes in real GDP and the unemployment rate are inversely related.
The Basic Model of Economic Fluctuations

- Two variables are used in developing a model to analyze the short-run fluctuations:
  1. The economy’s output of goods and services, measured by real GDP
  2. The overall price level, measured by the CPI or GDP deflator.

- The Model: Aggregate Demand and Aggregate Supply
The Aggregate Demand and Aggregate Supply Model

Price Level

Aggregate Supply (AS)

Aggregate Demand (AD)

Quantity of Output

QE

PE

Q^E
**Aggregate Demand and Aggregate Supply**

- The *Aggregate Demand Curve* shows the quantity of real GDP all households, firms and government are willing to buy at different price levels in the economy.

- The *Aggregate Supply Curve* shows the amount of real GDP created by all firms at different price levels in the economy.

- Together they determine GDP and the price level.
The Aggregate Demand Curve

- The aggregate demand (total expenditure) for goods and services may be referred to as:

\[ AD = C + I + G + NX \]

- Why is the aggregate demand curve downward sloping?
  1. Pigou’s Wealth Effect
  2. Keynes’ Interest Rate Effect
  3. Mundell-Fleming’s Exchange Rate Effect
  4. The Quantity Theory
Four Reasons for the Downward Slope of the Aggregate Demand

- *Pigou’s Wealth Effect:* A decrease in the price level makes consumers feel wealthier, which stimulates the demand for consumption goods.”
  - The increase in consumer spending means a larger quantity of goods and services (total real GDP) demanded.
    - High rates of growth in the past few years have been attributed to this effect as prices have not risen quickly relative to historic inflation rates.
Four Reasons for the Downward Slope of the Aggregate Demand

- Keynes’ Interest-Rate Effect: “The lower the price level, the less money households need to hold to buy the goods and services they want.”
  - A lower price level (or lower inflation) reduces the interest rate, encourages greater spending on investment goods, and thereby increases the quantity of goods and services demanded.
Four Reasons for the Downward Slope of the Aggregate Demand

- Mundell-Fleming’s Exchange-Rate Effect: “When our price level rises, the U.S. dollar appreciates and the foreign currency price of U.S. goods goes up. Foreigners buy fewer of our goods, while Americans purchase more of their goods.”
  - Overall: net exports (NX) falls.
  - Example: The Asian crisis reduced fears of overheating (inflation due to higher than potential output occurring) in the US economy in 1997 for this reason.
Four Reasons for the Downward Slope of the Aggregate Demand

- Quantity Theory:
  As P increases, assuming M and V are fixed, Y must decrease to maintain
  \[ MV = PY \]
  The result is a downward sloping curve in the short-run.
Factors that might shift the Aggregate Demand Curve

- Shifts in the aggregate demand curve may arise because of:
  1. Expectations changes causing changes in spending plans by consumers or firms.
  2. Changes in fiscal or monetary policy.

“Anything that causes buyers to want to purchase more or less than before will cause the aggregate demand schedule to shift.”
Factors that might shift the Aggregate Demand Curve

\[ AD = C + I + G + NX \]

- Fiscal Policy changes:
  - if Government expenditure (G) increases, AD goes up at all price levels (outward shift).
  - If taxes are lowered disposable income increases and consumption (C) causes AD to rise at all price levels (outward shift).
Factors that might shift the Aggregate Demand Curve

\[ \text{AD} = C + I + G + NX \]

- Monetary Policy changes:
- Recall the Quantity Theory:
  \[ MV = PY \]
  - an increase in money supply (M) increases the nominal GDP level (PY) since V is fixed.
  - This results in an outward shift of the AD curve (for any given P-level, Y is higher).
Outward shifts caused by higher expectations, government spending, lower taxes or increased money supply.
The Long-Run Aggregate Supply Curve

- In the long-run, GDP level depends on the production function and factors of production available (L, K, R).
  \[ Y = F(K, L, R) \]
- The price level does not affect these variables in the long-run.
- The Long-Run Aggregate Supply Curve is vertical at full-employment GDP (real GDP level where natural rate of unemployment occurs) with respect to the price level.
The Long-Run Aggregate Supply Curve

Long-run Aggregate Supply (LRAS)

Output at Full Employment or when economy is at the “Natural Unemployment” level.
(“Potential GDP” given L, K, R and technology available)
Shifts in the Long-Run Aggregate Supply Curve

- Over time, any change in the factors that determine the long-run aggregate supply will cause the curve to shift (changes in L, K, R or technology).
  - An event that reduces potential output shifts the schedule to the left.
  - Any change that increases the economy’s potential output will shift the curve to the right.
**The Very Short-Run Aggregate Supply Curve**

- In the very short run, prices are “sticky”, that is, they do not have time to adjust to changes in output.
  - Wages and prices may be “sticky” in the short run.
- If all prices do not adjust, the price level would remain constant at all levels of output.
- This creates a horizontal “very” short run supply curve which is relevant in the very short run.
The Short-Run Aggregate Supply (SRAS) Curve

- If some prices change and others don’t, we get an intermediate case, or an AS curve with an upward slope.
- If a firm’s price for it’s good increases, they produce more output.
- An increase in some prices increases the overall level of prices in the economy tends to raise the quantity of goods and services supplied (real GDP).
3 Reasons for the SRAS Curve sloping upward

Sticky wages: wages are set - if prices rise, but wages are fixed due to contracts, etc., firm revenue rises (from the price increase of their good) but labour costs haven’t.

- This increases profits so firms produce more.
- Output rises as prices rise (SRAS is upward-sloped).
3 Reasons for the SRAS Curve sloping upward

Sticky Prices: due to things like menu costs - when prices fall not all firms lower prices right away. When some do and some don’t, firms with sticky (and now relatively higher) prices experience declining sales.

- This decreases profits for these firms so they produce less
- Output falls as prices fall (SRAS is upward-sloped)
3 Reasons for the SRAS Curve sloping upward

Misperceptions (confusion): Producers may mistake an overall decrease in prices for a decrease in their good’s relative price.

- They mistakenly believe this will decrease profits for them (it won’t- if all prices fall, so do their costs) and they produce less.
- Output falls as prices fall (SRAS is upward-sloped).
As time goes on, more and more prices can change and the aggregate supply curve gets steeper until it is vertical in the long run.
Causes of Aggregate Supply Curve Shifts (Short and Long Run):

- Since \( Y = A(L,K,R) \)- Factor changes may lead to a shift in the short-run aggregate supply curve.
  - Changes in Labour Supply (L)
    - As L falls, SRAS shifts inward.
  - Changes in Capital Supply (K)
    - As K rises, SRAS shifts outward.
  - Changes in Resource Supply (R)
    - As R rises, SRAS shifts outward.
  - Changes in Technology (A)
    - Such improvements shift SRAS outward.
Short Run Aggregate Supply Curve Shifts: Expectations

- Expectations may also cause the SRAS to shift.
  - People may expect inflation or deflation.
  - If they expect the price level to rise, they demand higher wages—raising firm costs, and forcing price increases.
  - This results in an upward shift of the SRAS—the same production level occurs at a higher price level.
  - Opposite occurs for expected deflation—the SRAS shifts down because prices and wages fall at every output level.
Shifts in the Aggregate Supply Curve

Shifts outward caused by changes in factors of production (L,K, R), technology, or expectations.
Equilibrium in the Long-Run

- Equilibrium output, employment and price level are determined by the intersection of the aggregate demand curve and the long-run aggregate supply curve.
- Output is at its natural rate and the short-run aggregate supply curve passes through the point of intersection.
Equilibrium in the Long-Run

In the long run, the economy tends toward the natural rate of employment at potential output level of GDP.
Recession in the Short Run

- Two sources from which a recession in the economy may occur:
  - A decrease (leftward shift) in aggregate demand
  - A decrease (leftward shift) in aggregate supply

- Shifts in the aggregate demand or the aggregate supply curves result in fluctuations in the economy’s output of goods and services.
Source of Recession: A Decrease in Aggregate Demand

- For a given price level, a decrease in one or more components of the total spending function (C, I, G or NX) will cause the aggregate demand schedule to shift leftward.
  - Output falls below the full employment output ("cyclical unemployment")
  - Unemployment rises
  - Price levels fall or inflation is reduced
A Decrease in Aggregate Demand

Price Level

Aggregate Supply

Aggregate Demand

Quantity of Output

Q^E

P^E
A Decrease in Aggregate Demand

Price Level

Aggregate Supply

Aggregate Demand

$P^E$

$Q^E$

Quantity of Output
A Decrease in Aggregate Demand

Reduced GDP causes "cyclical" or short run unemployment.
A Reduction in Aggregate Demand

1. A fall in aggregate demand...

2. ...lowers output in the short run...

3. ...but in the long run affects only the price level.
An Increase in Aggregate Demand

1. A rise in aggregate demand...
2. ...raises output in the short run...
3. ...but in the long run affects only the price level.

Price level, $P$

Income, output, $Y$

LRAS

C

A

B

AD₁

AD₂
Source of Recession: A Decrease in Aggregate Supply

- A decrease in short-run aggregate supply (possibly caused by higher input prices) will result in a new equilibrium along the aggregate demand curve at a level of GDP below full employment.
  - A fall in total output below full output
  - An increase in unemployment
  - An increase in prices or inflation
A Decrease in Aggregate Supply

Quantity of Output

Price Level

Aggregate Supply

Aggregate Demand

$P^E$

$Q^E$
A Decrease in Aggregate Supply

Price Level

Aggregate Supply

Aggregate Demand

Quantity of Output

Q^E

P^E
A Decrease in Aggregate Supply

Reduced GDP causes “cyclical” unemployment
A Decrease in Aggregate Supply

- When the aggregate supply curve shifts left, the price level rises and output decreases. This is called *Stagflation*.

- *Stagflation* refers to a simultaneous decrease in real GDP and an increase in prices or inflation.
Actions by Policymakers During Periods of Recession

- Policymakers, when faced by decreasing aggregate demand or supply could:
  - Do nothing, waiting for all prices to adjust in the long run.
  - Take action to increase aggregate demand using expansionary fiscal policy (e.g. increase government spending or decrease taxes).
  - Implement expansionary monetary policy.
Doing Nothing in a Recession

- In a recession, prices are low. This should eventually increase consumption, resulting in higher output and more labour being hired.

- In order for more labour to be hired, or consumption to increase, expectations must improve.

- Improved expectations could take time to form, causing recessions to be long-lasting.
Doing Nothing in a Recession

Price Level

Aggregate Supply

Improved expectations and low prices, including wages may increase AD, ending the recession. This could take time.

Aggregate Demand

Quantity of Output

Q^R, Q^E

P^E, P^R
Expansionary monetary or fiscal policy

- Notice by increasing the money supply or government spending, or reducing taxes, the AD curve shifts outward.
- Such “expansionary” policies could decrease unemployment but also cause inflation.
- This is called the “unemployment-inflation tradeoff”.
Using Aggregate Demand to end a Recession

Expansionary fiscal or monetary policy shifts the AD curve to the right, increasing employment and output.
Expansionary Policy

- Since expansionary policy can shift AD to the left and increase prices causing inflation, it is used sparingly.

- A warning: Continuous deficits caused by higher and higher spending are therefore inflationary as well as bad for growth if government spending does not increase the economy’s capital.
Summary:

- Economic fluctuations can be analyzed using aggregate demand and aggregate supply.
- Slope of the AS function depends on the time-frame.
- In the long run, output and unemployment tend to their potential levels, making the AS vertical. In the short run, AS is flatter.
- AS is shifted by changes in input prices, productivity, or business taxes. AD is shifted by expectations or government action (expansionary fiscal or monetary policy).
- Rightward shifts in AD or AS can cause a recession (reduced output and cyclical unemployment).
- In the case of a recession, the government could do nothing, in which case recessions may be long-lasting, or use expansionary fiscal or monetary policy to shift AD outward.
- Expansionary fiscal and monetary policies face the unemployment-inflation tradeoff.