Aggregate Demand
Aggregate Supply

15.012 Applied Macro and International Economics

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Class Outline

- The Business-Cycle: Potential and Actual GDP
- Aggregate Demand (AD)
  - The interest-rate effect and slope
- Aggregate Supply (AS)
  - Long-run → potential output, vertical AS
  - Short-run → sticky prices, positive slope AS
- Effects of Policies in AS-AD
Potential and Actual GDP

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

- Potential GDP \( \rightarrow \) estimate of GDP when all factors of production (capital, labor, and technology) are used at “normal” rates
  - Long-run \( \rightarrow \) Growth theory \( Y = Af(K,L) \) \( \rightarrow \) not in 15.012

- Actual GDP \( \rightarrow \) can be different because of booms and recessions
  - These are short-run fluctuations, also called the “business cycle”
  - We will use the AS-AD model to analyze it
Potential and Actual GDP

Output

Time

Boom

Recession

Actual GDP

Potential GDP
IS-LM and AS-AD

IS Curve
Goods market
Y-C-G = I(i, bc)

LM Curve
Money Market
Ms = Md(PY, i)

 Aggregate Demand

Aggregate Supply (sticky prices)

Prices and Output

Graph showing IS-LM and AS-AD relationships.
IS-LM and AS-AD

- AS-AD $\rightarrow$ prices can change
- In the money market... $Ms = Md(i, PY)$
Aggregate Demand

Why is the AD curve downward sloping? (not micro...)

• Wealth effect
  \( \downarrow P \rightarrow \text{wealthier} \rightarrow \uparrow C \rightarrow \uparrow Y \)

• Interest rate effect (LM)
  \( \downarrow P \rightarrow \text{less money needed to buy} \)
  \( \rightarrow \downarrow Md \rightarrow \text{put money in bank} \)
  \( \rightarrow \downarrow i \rightarrow \uparrow I \rightarrow \uparrow Y \)

• Exchange rate effect
  \( \downarrow P \rightarrow \downarrow i \rightarrow \uparrow \text{Capital Outflows} \)
  \( \rightarrow \text{Sell dollars} \rightarrow \text{Dollar Depreciates} \)
  \( \rightarrow \uparrow \text{net exports } X \rightarrow \uparrow Y \)
The interest rate effect

Money Market

\[ \downarrow P \rightarrow \text{less cash needed to buy things} \rightarrow \downarrow \text{Md} \rightarrow \downarrow i \rightarrow \uparrow I \rightarrow \uparrow Y \]
Aggregate Demand

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

Increases in C, I, G or NX will make the AD curve shift to the right.
Monetary Policy and AD

- Expansionary monetary policy,
  \[\uparrow \text{money supply} \rightarrow \downarrow \text{interest rates} \rightarrow \uparrow \text{investment} \rightarrow \uparrow \text{Y and AD}\]
Fiscal Policy and AD

- Expansionary fiscal policy
  \[ \uparrow G \rightarrow \uparrow AD \]
  Or \[ \downarrow T \rightarrow \uparrow C \rightarrow \uparrow AD \]
Demand and Supply

- Monetary and fiscal policies move aggregate demand (AD)
- But final impact on Y and P depends on....
- Aggregate Supply (AS)
  - Long run
  - Short run
AS curve in Long Run

- Long-run (LRAS) $\rightarrow$ capacity to produce by an economy given by $Y=Af(K,L)$

$LRAS = Potential\ Output$

$P$

$Y$

$AD$

$K$ is the capital stock, which depends on savings and investments.

$L$ is the labor force, affected by workers and average number of hours worked.

$A$ is the technology, skills, quality of management.
AS Curve in Short Run

• Completely Flexible prices (classical view)
  – Output is given by potential output
  – Increase in AD lead only to increases in price
    • AS curve is a vertical line
    • Monetary and fiscal policy have no effect on output

\[ \text{Flexible Prices} \]
\[ \text{Actual } Y = \text{Potential } Y \]
AS Curve in Short Run

• Completely fixed prices (Keynesian view)
  – Increases in AD can be met by increases in output
    • AS curve is a horizontal line
    • Monetary and fiscal policy can affect output
AS Curve in Short Run

• New “consensus” view:
  – Upward-sloping AS curve due to “sticky” prices

Sticky Prices $\rightarrow$ firms adjust prices slowly

Why?
• Menu Costs
• Contracts
• Staggered price setting
• Coordination failure
• Customer relations
AS Curve in Short Run

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Curved $\rightarrow$ depends on the degree of slack in the economy (more Keynesian to the left, classical to the right)
AS-AD in equilibrium
Policy example: Expansionary MP

Short-run effects:

\( \uparrow P \) and \( \uparrow Y \)

\( Y_{\text{actual}} > Y_{\text{Pot}} \) \( \rightarrow \) boom or over-employment

inflationary gap
Example: Expansionary MP

Transition to Long - Run

With time, AS moves up as more and more firms adjust their prices

In the LR, $Y_{\text{actual}} = Y_{\text{Pot}}$

Long-run effects:

$\uparrow P$

no change in $Y$
AS-AD and policy analysis

• What is your starting position?
  • Equilibrium
  • Boom
  • Recession

• What is the main shock?
  • Demand or supply?

• Different policies can achieve different things
  • Monetary and Fiscal Policy \(\rightarrow\) target the AD
  • Supply-side policies \(\rightarrow\) target the AS
Demand-shock Recession

Fall in AD $\rightarrow$ $\downarrow$ Y, $\downarrow$ P

-Policy Response?

Expansionary Monetary and/or Fiscal Policy $\rightarrow$ $\uparrow$ Y, $\uparrow$ P $\rightarrow$
restore the equilibrium
If there is an oil price shock that shifts AS in $\rightarrow \downarrow Y, \uparrow P$ (stagflation)

Policy options?

**Option 1:**
Shift AD out to stabilize Y

**Option 2:**
Shift AD In to stabilize P

**Option 3:**
“Supply Side” Economics $\rightarrow$ production incentives to get closer to potential Y $\rightarrow$ try to push LRAS as well
US in the 80’s: Reagan
Remember

• The AS-AD model and transition back to potential output

• Monetary and fiscal policy in the AS-AD model

• Use it for shock and policy analysis:
  – Starting position?
  – Type of shock?
  – Effects of policies? Short-run vs Long-run
Next Class

- So far we have talked about stabilization policies in an closed economy

- Next two classes we will talk more about how the Central Bank operates, introduce exchange rates and discuss financial crises