Lecture 9: IS-LM Model

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Course: Macroeconomics 101

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The Road Ahead

1. Goods Market and IS Relation
2. Financial Market and LM Relation
3. IS-LM Model

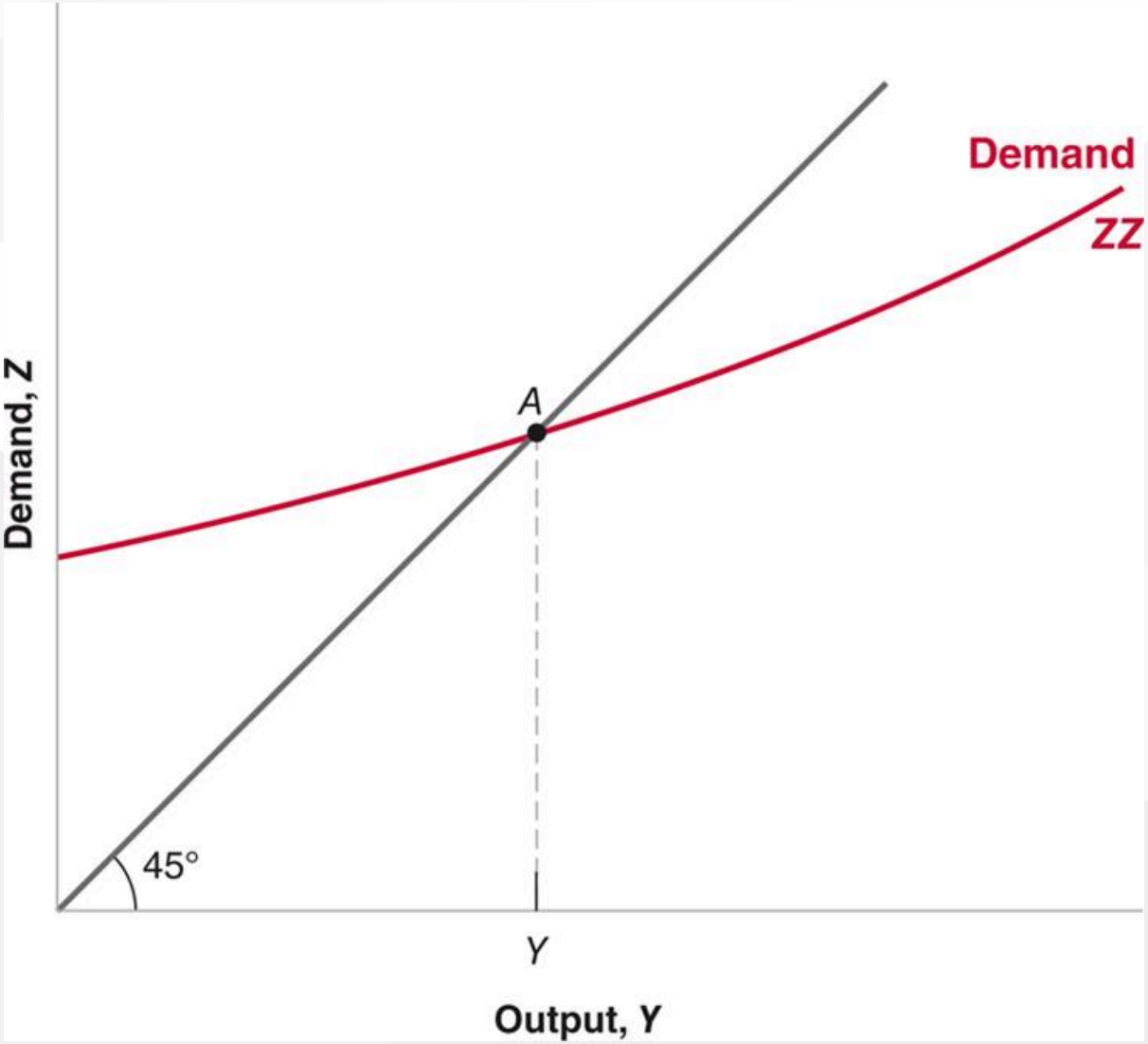
Goods Market Equilibrium Revisited

IS relation: (Y, i)

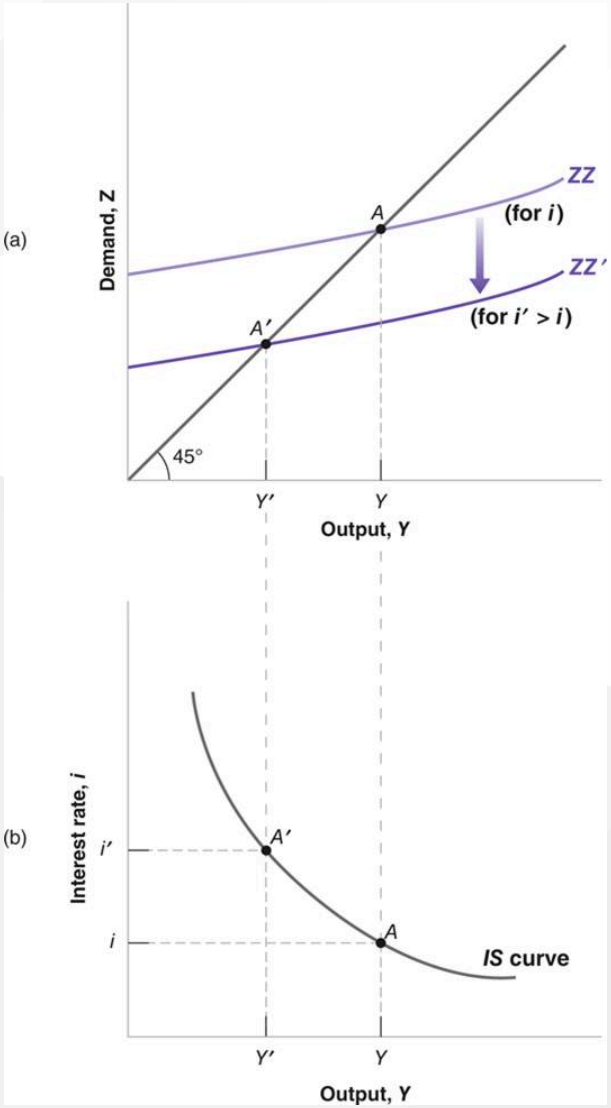
$$\underbrace{Y}_{\text{GDP}} = \underbrace{C(Y-T) + I(Y, i) + G + NX}_{\text{aggregate expenditure (AE)}}$$

- Investment (I) depends on two main factors:
  - level of sales, equal to production (Y) under no inventory investment
  - interest rate (i), **cost/price of borrowing**
- Some remarks:
  - given i, $Y \uparrow \Rightarrow (C, I) \uparrow \Rightarrow$ AE $\uparrow$
  - empirics: $Y \uparrow \Rightarrow C + I \uparrow$ less than one for one

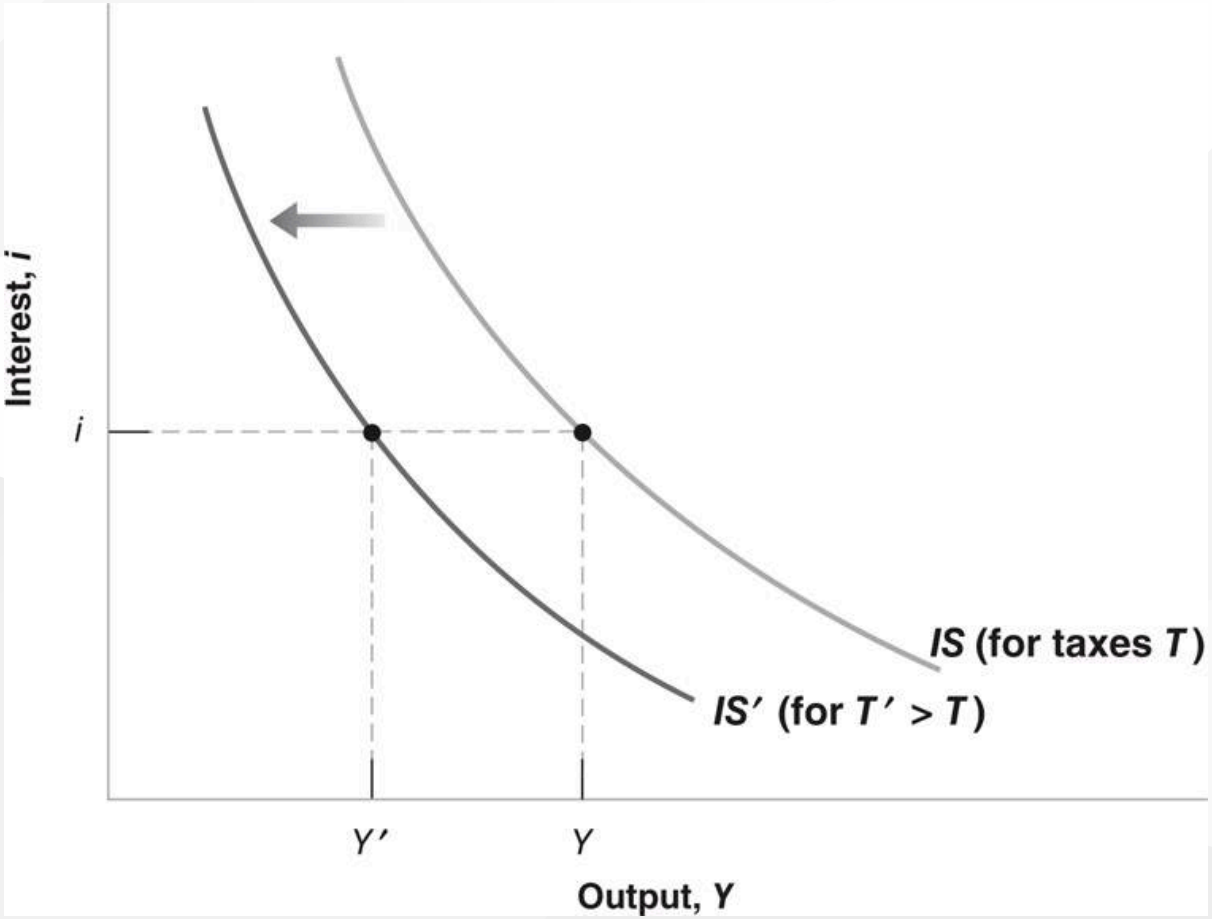
Equilibrium Y Given i



Deriving IS Curve



Shift of IS Curve



- Given $i, T \uparrow \Rightarrow C \downarrow \Rightarrow Y \downarrow$ through multiplier
- IS curve shifts to left

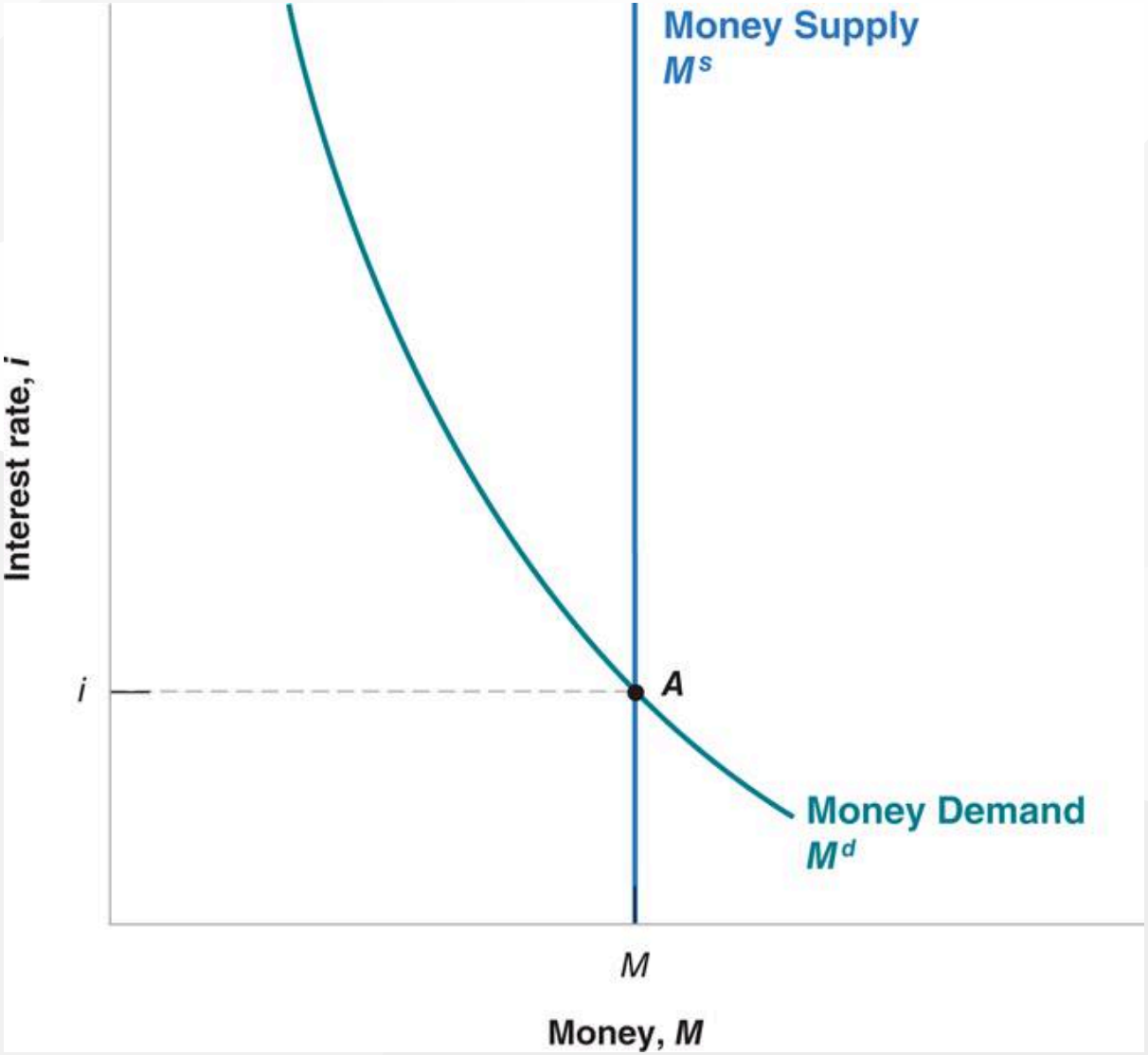
Financial Market Equilibrium Revisited

LM relation: (Y, i)

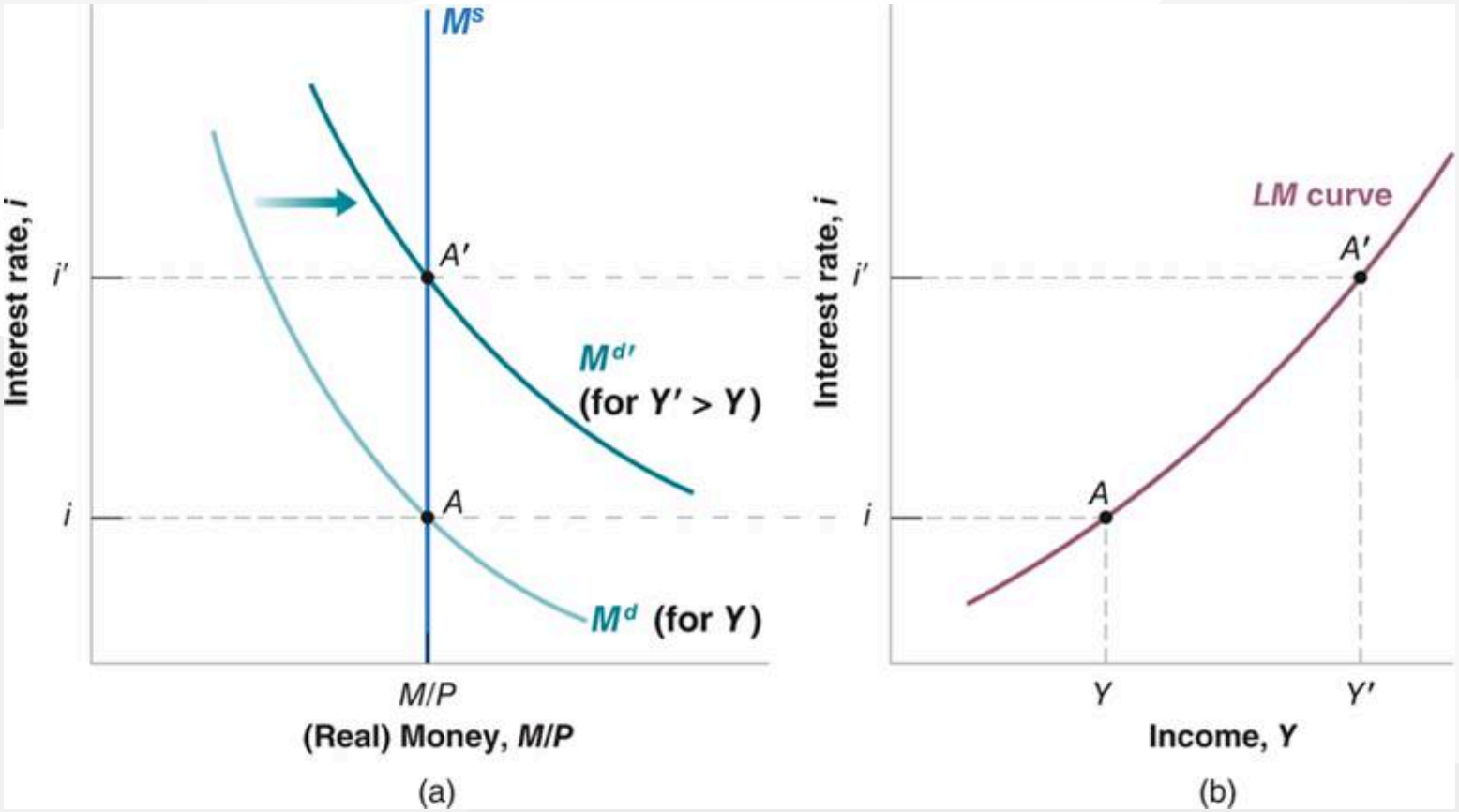
$$M^s = M^d = \$Y \times L(i) \quad \Rightarrow \quad \frac{M^s}{P} = \frac{M^d}{P} = Y \times L(i)$$

- Money demand (M^d) depends on two main factors:
  - level of transactions, assumed to be proportional to nominal GDP ($\$Y$)
  - nominal interest rate (i) on bonds, hence **opportunity cost/price of holding money**
- Notations:
  - P = price level, e.g. GDP deflator/CPI
  - M^s/P = real money supply
  - M^d/P = real money demand

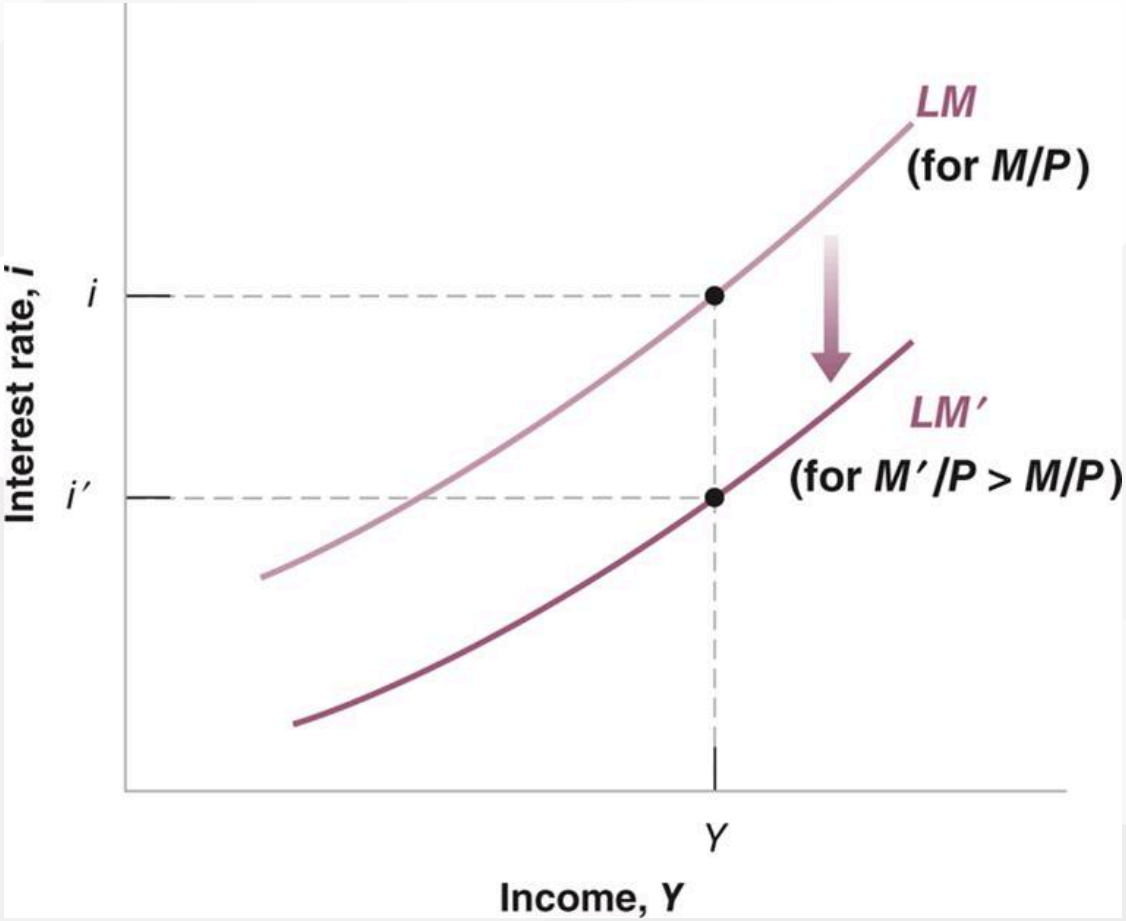
Equilibrium i Given Y



Deriving LM Curve

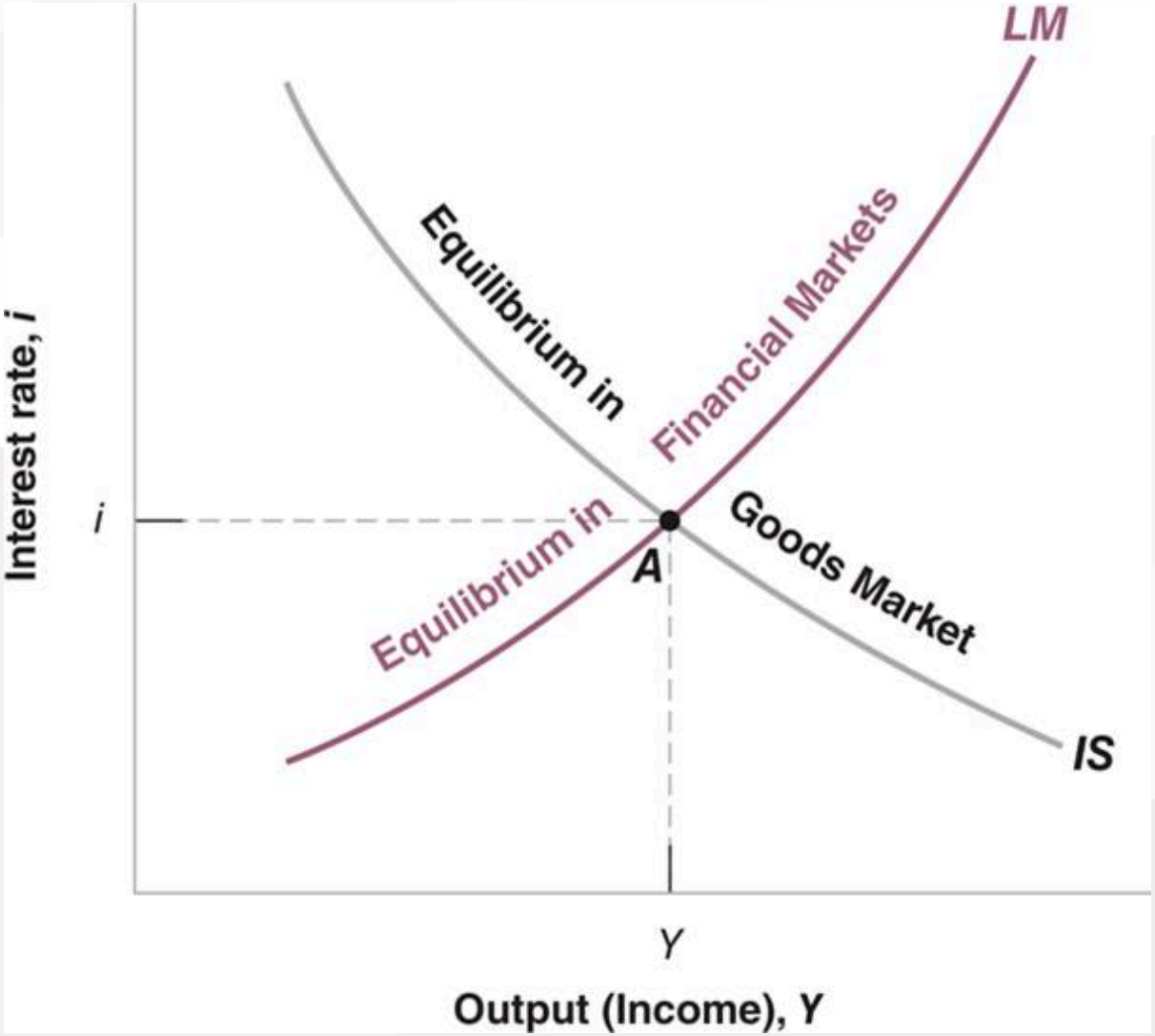


Shift of LM Curve

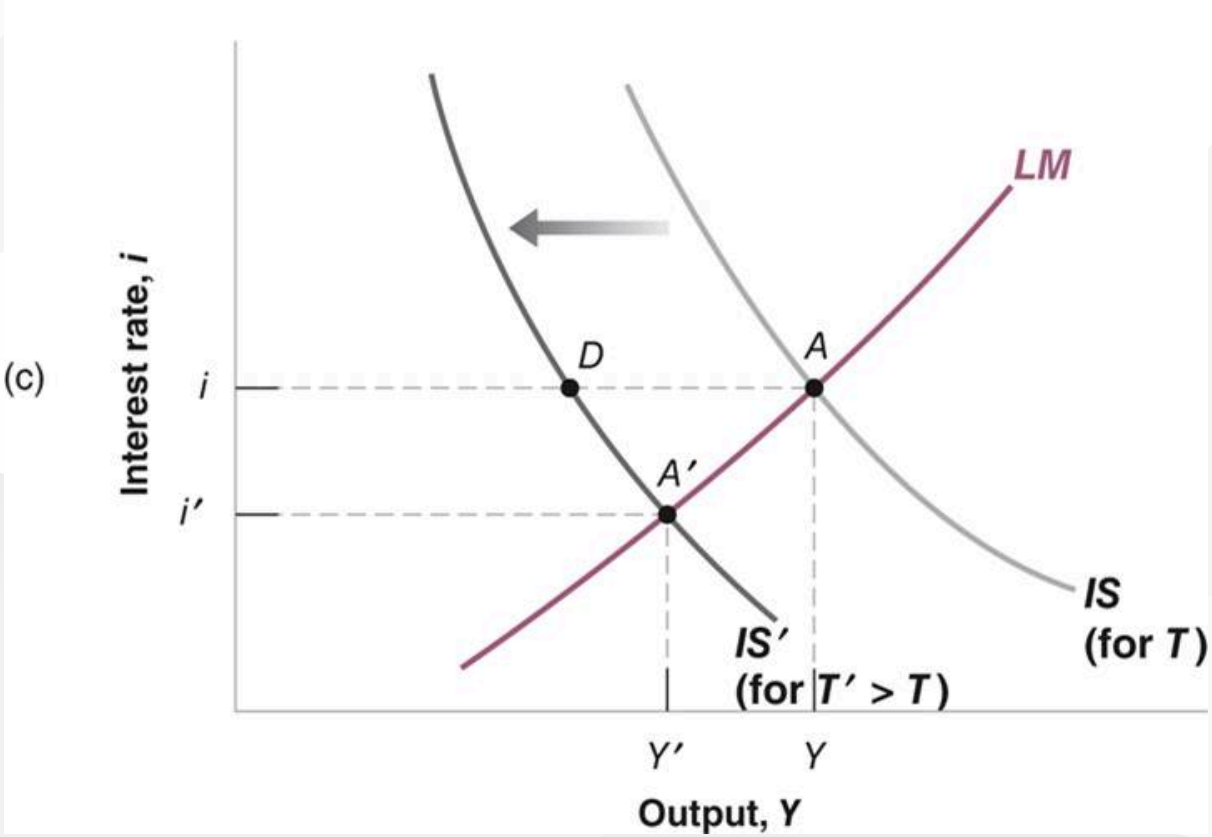


- Given (Y, P), $M^s \uparrow \Rightarrow M^s/P > M^d/P \Rightarrow i \downarrow$
- LM curve shifts down

IS-LM Model

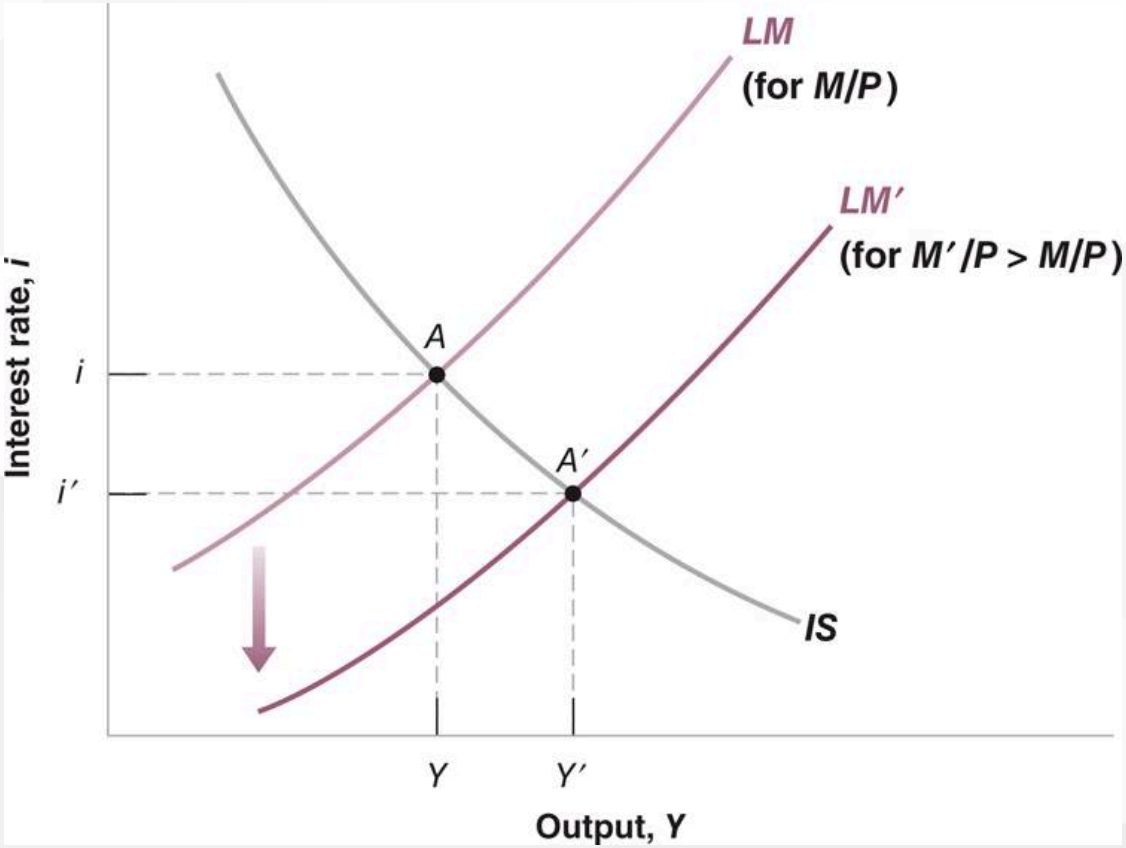

LM
Equilibrium in
Financial Markets
Interest rate, i
i
Equilibrium in
A
Goods Market
IS
Y
Output (Income), Y

Effects of Fiscal Contraction



- Fiscal contraction/consolidation: decrease in $G - T$
- Consider $T \uparrow \Rightarrow$ IS curve $\leftarrow$, LM curve unchanged
- In equilibrium, $Y \downarrow, i \downarrow$ (Explain!)

Effects of Monetary Expansion



- Monetary expansion: increase in M^s (How?)
- $M^s \uparrow \Rightarrow$ IS curve unchanged, LM curve $\downarrow$
- In equilibrium, $Y \uparrow, i \downarrow$ (Explain!)

Readings & Exercises

- Readings
  - BJ: lecture 4
- Exercises
  - Graphically illustrate effects of fiscal expansion or monetary contraction on equilibrium output and interest rate. EXPLAIN your results.