

Lecture 8 Goods and Financial Markets: The IS-LM Model

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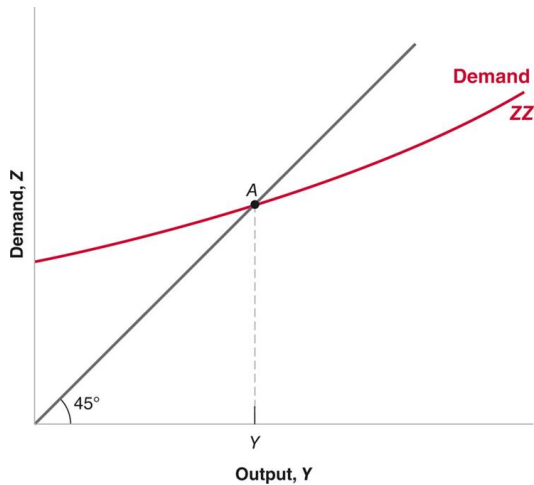
Goods Market Equilibrium Revisited

IS relation: (Y, i)

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

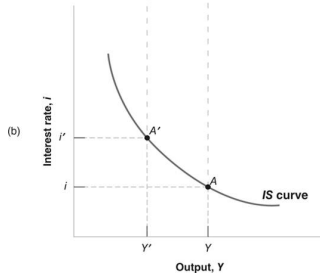
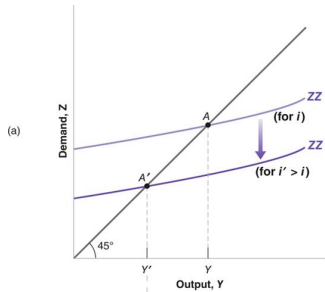
- ▶ Investment (I) depends on two main factors
 - ▶ level of sales, equal to production (Y) under no inventory investment
 - ▶ interest rate (i), **cost/price of borrowing**
- ▶ Some remarks
 - ▶ given i , $Y \uparrow \Rightarrow (C, I) \uparrow \Rightarrow \text{AE} \uparrow$
 - ▶ empirics: $Y \uparrow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

Equilibrium Y Given i

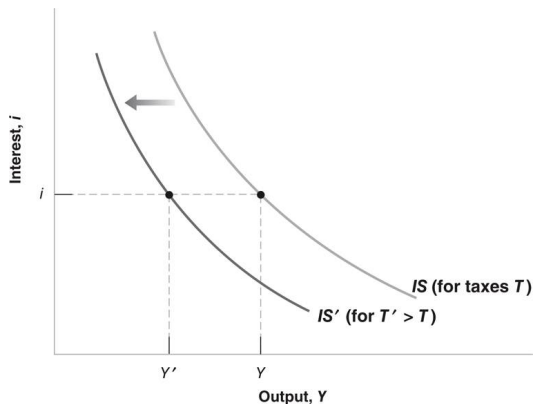


- ZZ curve: aggregate expenditure/demand

Deriving IS Curve



Shift of IS Curve



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

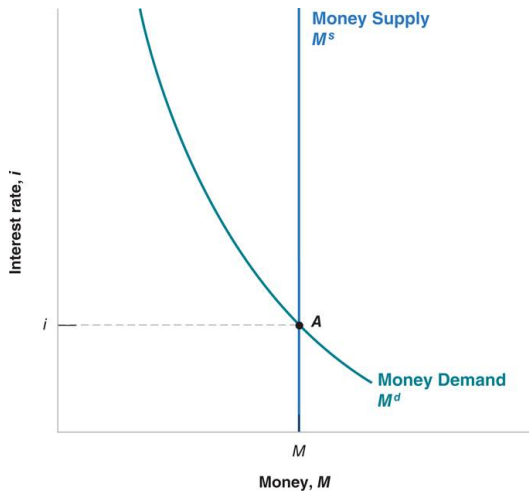
Financial Market Equilibrium Revisited

LM relation: (Y, i)

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

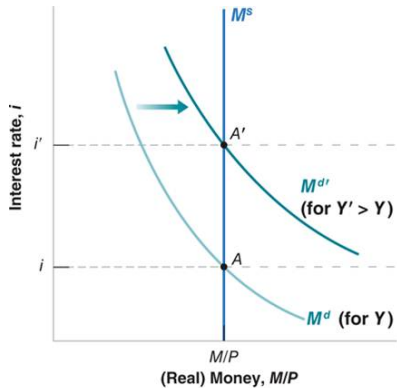
- ▶ Money demand (M^d) depends on two main factors
 - ▶ level of transactions, assumed to be proportional to nominal GDP ($\$Y$)
 - ▶ nominal interest rate (i) on bonds, hence **opportunity cost/price of holding money**
- ▶ Notations
 - ▶ P = price level, e.g. GDP deflator/CPI
 - ▶ M^s/P = real money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

Equilibrium i Given Y

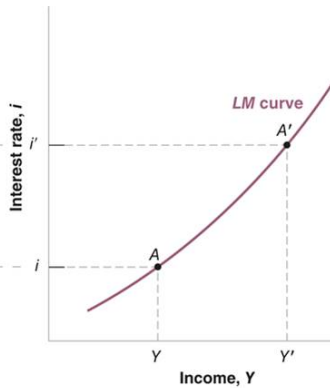


- M^s is set/controlled by Fed

Deriving LM Curve

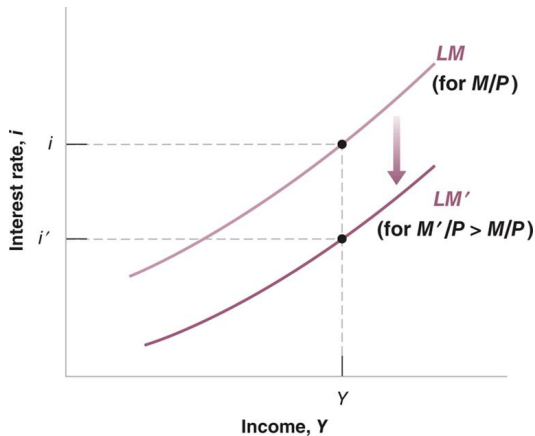


(a)



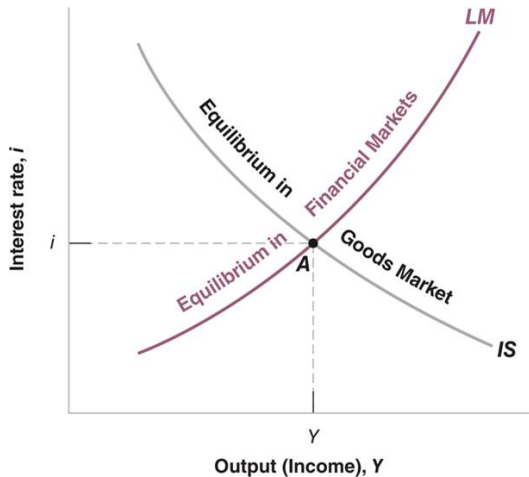
(b)

Shift of LM Curve



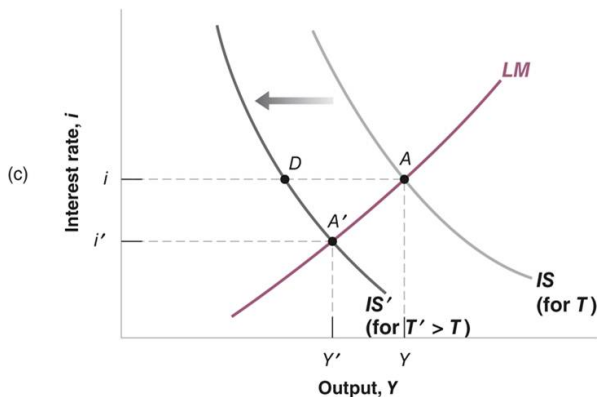
- ▶ given (Y, P) , $M^s \uparrow \Rightarrow M^s/P > M^d/P \Rightarrow i \downarrow$
- ▶ LM curve shifts down

Joint Determination of (Y, i)



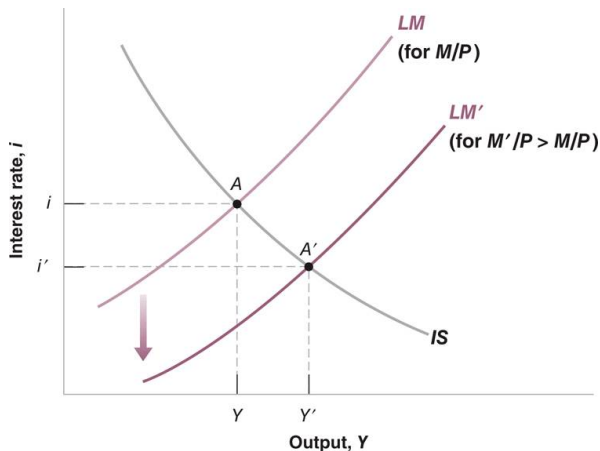
- Simultaneous equilibrium of goods and financial markets

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
 - ▶ In-class quiz: Graphically illustrate effects of fiscal expansion or monetary contraction on equilibrium output and interest rate. EXPLAIN your results.