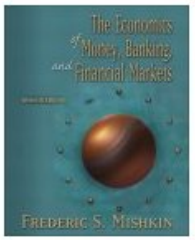
ECON 354
Money and Banking

Professor Yamin Ahmad

Lecture 10: IS-LM Part II

- Factors that shift the IS-LM Curves
- IS-LM in the Long run
- The Relationship Between the IS-LM and the AD-AS models.



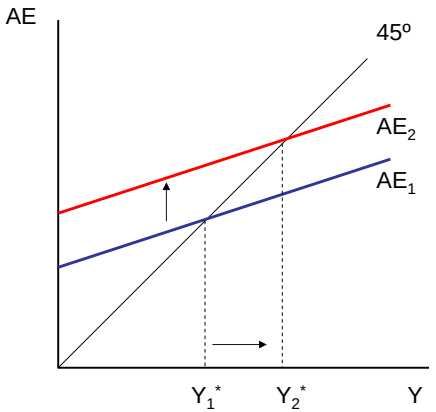
Big Concepts

- Factors that influence the IS-LM Curves
- Effectiveness of Fiscal Policy vs. Monetary Policy
- Effectiveness of Money Supply vs. Interest Rate targeting
- Going from IS-LM framework to the AD-AS framework

Note: These lecture notes are incomplete without having attended lectures

Shifts in the IS Curve

- Lets examine what happens if there is a change in Investment in the AE model:
- Suppose *I* ↑ in the AE model:
  - ceteris paribus (including r), *AE* ↑, *Y* ↑



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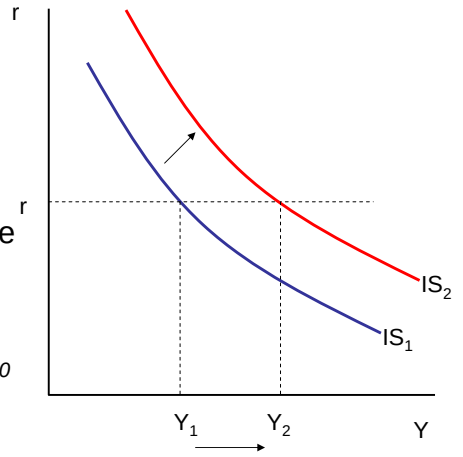
Shift in the IS Curves

- Suppose *I* ↑:
  - In AE model, Y ↑
  - For IS curve: for given *r*, *AE* ↑, *Y* ↑ ⇒ *IS* shifts right
- Other factors that shift the IS curve: C_0,G,T,NX
- Same reasoning when C_0 ↑, *G* ↑, *NX* ↑, *T* ↓



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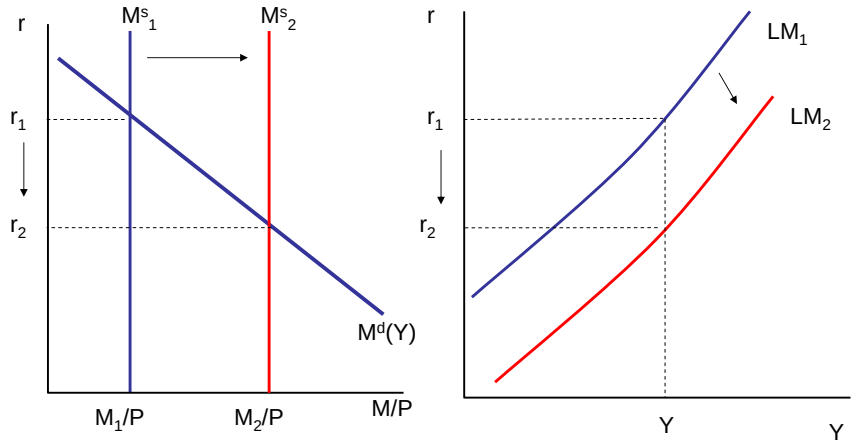
Shifts in the LM Curve

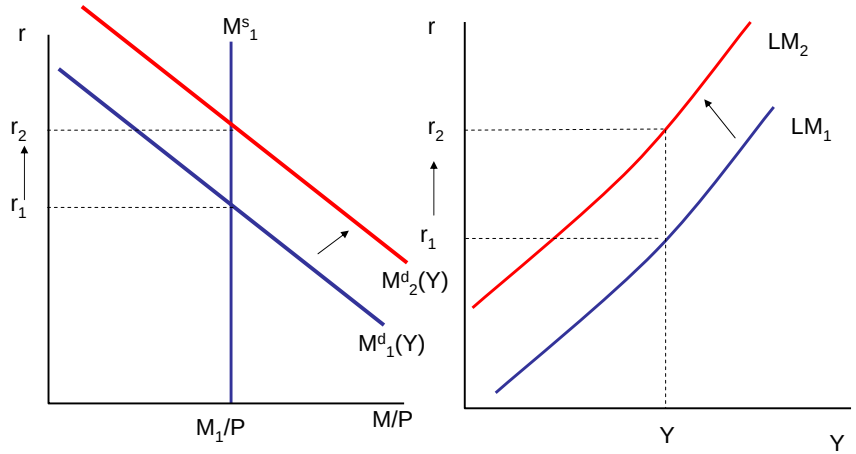
- Factors that shift the supply of real Money Balances:
  - ΔM^s
  - ΔP
- Factors that shift the Demand for real money balances:
  - ΔY
  - $\Delta \pi^e$

Shift in the *LM* Curve from a Rise in M^s



- Suppose $M^s \uparrow$: at given Y, $r \downarrow \Rightarrow$ *LM* shifts to the right

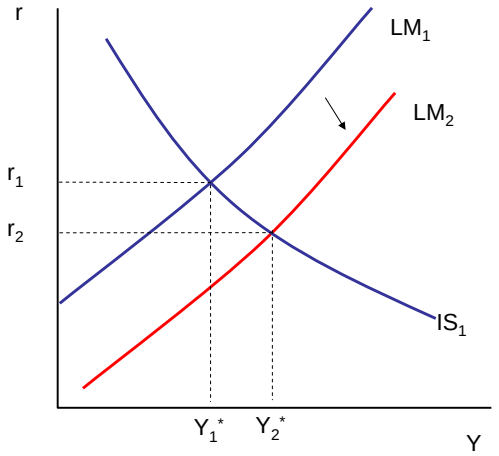
Shift in the *LM* Curve from a Rise in M^d



- $M^d \uparrow$: at given Y, $r \uparrow \Rightarrow$ *LM* shifts to the left

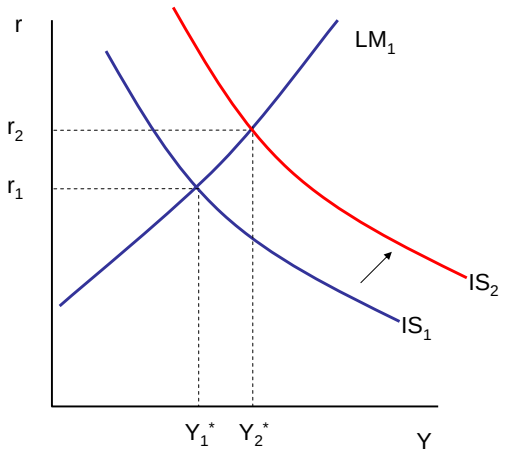
Response to an Increase in M^s

- *Looking at both IS and LM curves, a* $M^s \uparrow$: $r \downarrow$, *LM* shifts right $\Rightarrow$ $Y \uparrow$ $r \downarrow$



Response to Expansionary Fiscal Policy

- *Suppose either G* ↑ or *T* ↓: *AE* ↑, *IS* shifts right ⇒ *Y* ↑ *r*↑



Summary: Factors that Shift *IS* and *LM* Curves

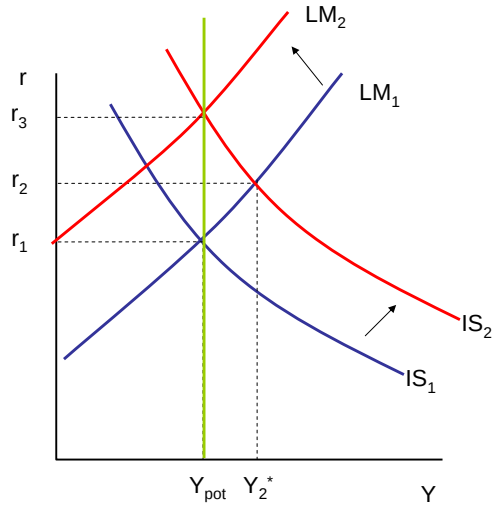
Factor		Shifts	Effect on Y and r
C I G NX	Increases	IS Curve right	*Y* ↑ *r*↑
T	Decreases	IS Curve right	*Y* ↑ *r*↑
M^s	Increases	LM Curve right	*Y* ↑ *r*↓
M^d	Increases	LM Curve left	*Y* ↓ *r* ↑

The *ISLM* Model in the Long Run

- The IS-LM model is a model of the short run. Prices are assumed to be fixed in the short run. What happens in the Long run?
- In the long run, prices can adjust. We can see the impact of a one shot price adjustment in the IS-LM model.
- Consider an increase in Y (above potential GDP, Y_{pot}):
  - ➢ Because of an outward shift of the IS curve
  - ➢ Because of an outward shift of the LM curve

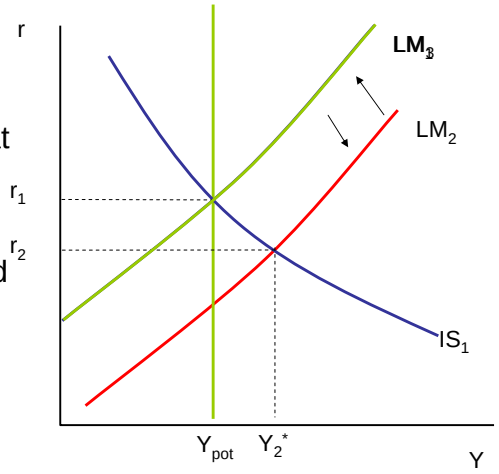
The *ISLM* Model in the Long Run

- *Suppose G* ↑, then, *IS* shifts right to IS_2,
- Hence, at short run equilibrium, $r = r_2$ and $Y = Y_2^*$.
- In the long run, because $Y_2 > Y_{pot}$, *P* ↑, *M/P* ↓, *LM* shifts left to LM_2,
- Hence, at final (long run) equilibrium, $r = r_3$, and $Y = Y_{pot}$



The *ISLM* Model in the Long Run

- *Suppose* $M^s \uparrow$, then, *LM* shifts right to LM_2
- Short run equilibrium is at $r = r_2$, $Y = Y_2$
- In the long run, since $Y_2 > Y_{pot}$, $P \uparrow$, $M/P \downarrow$, and *LM* curve shifts back to LM_1
- Long run equilibrium is where $r = r_1$ and $Y = Y_{pot}$



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IS-LM and Aggregate Demand

- So far, we've been using the *IS-LM* model to analyze the short run, when the price level is assumed fixed.
- However, a change in ***P*** would shift *LM* and therefore affect ***Y*.**
- The **Aggregate Demand curve** (*introduced in Lecture 2*) captures this relationship between ***P*** and ***Y*.**

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Aggregate Demand

- Recall from before, by plugging interest rates from the LM relation into the IS relation, we obtain:

$$Y = \frac{C_0 + I_0 + G - c_1 T}{1 - c_1} - \frac{b}{1 - c_1}\left(\frac{m_0 + kY - M/P}{h}\right)$$

$$= \frac{C_0 + I_0 + G - c_1 T - bm_0/h + bM/hP}{1 - c_1 + bk/h}$$

- Thus demand is decreasing in P (unless b/h=0)
- Why? P↑ ⇒M/P↓ ⇒ LM ↑ ⇒r ↑ ⇒ I↓ ⇒ Y↓ (Keynes Effect)
- Horizontal Shifts in AD from IS/LM analysis.

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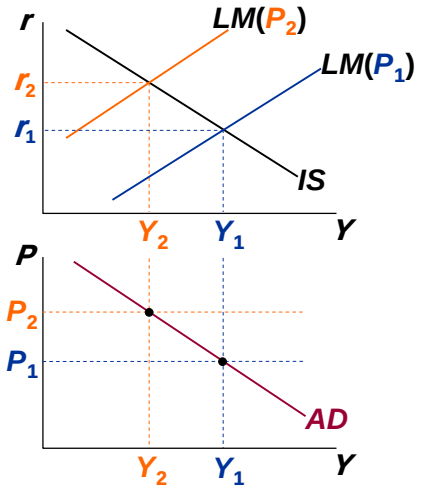
Deriving the *AD* curve

Intuition for slope of *AD* curve:

↑***P*** ⇒ ↓(***M/P***)
⇒ *LM* shifts left
⇒ ↑***r***
⇒ ↓***I***
⇒ ↓***Y***



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Monetary policy and the *AD* curve

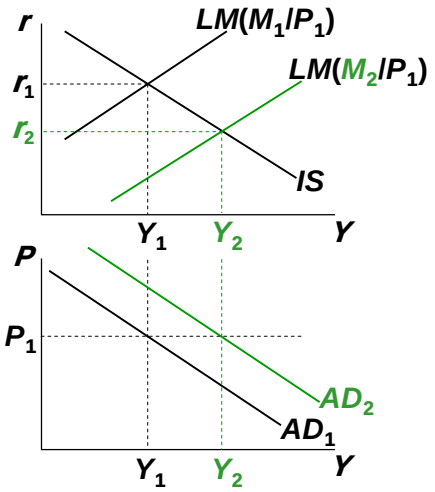
The Fed can increase aggregate demand:

↑***M*** ⇒ *LM* shifts right

⇒ ↓***r***

⇒ ↑***I***

⇒ ↑***Y*** at each value of ***P***



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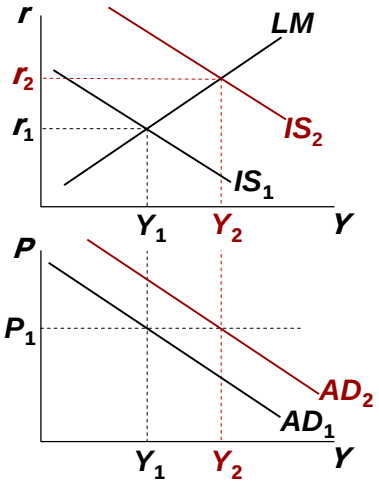
Fiscal policy and the *AD* curve

Expansionary fiscal policy (↑***G*** and/or ↓***T***) increases Agg. demand:

↓***T*** ⇒ ↑***C***

⇒ *IS* shifts right

⇒ ↑***Y*** at each value of ***P***



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IS-LM and *AD-AS* in the short run & long run

Recall from Lecture 2: The force that moves the economy from the short run to the long run is the gradual adjustment of prices.

In the short-run equilibrium, if	then over time, the price level will
$Y > \overline{Y}$	rise
$Y < \overline{Y}$	fall
$Y = \overline{Y}$	remain constant

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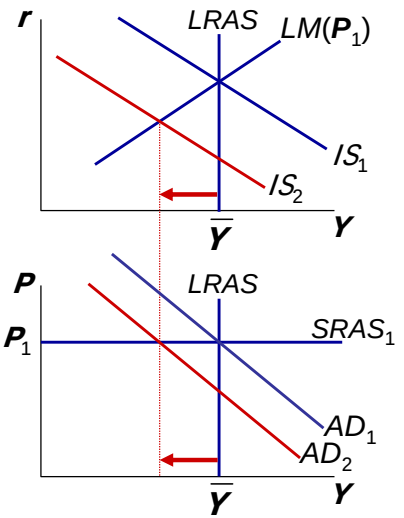
The SR and LR effects of an *IS* shock

A negative *IS* shock shifts *IS* and *AD* left, causing ***Y*** to fall.



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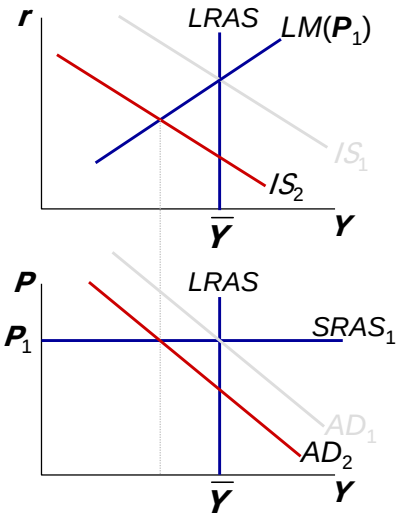
The SR and LR effects of an *IS* shock

In the new short-run equilibrium, $Y < \overline{Y}$

Over time, ***P*** gradually falls, which causes

- *SRAS* to move down.
- ***M/P*** to increase, which causes *LM* to move down.



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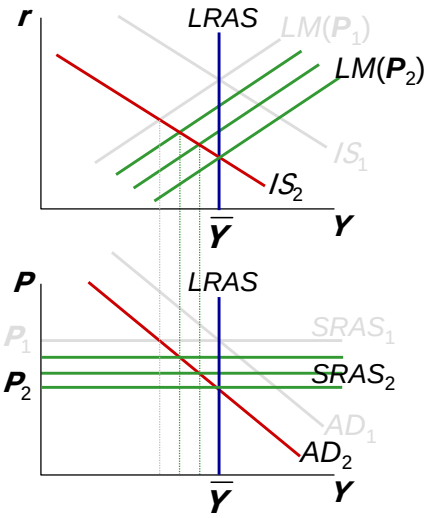
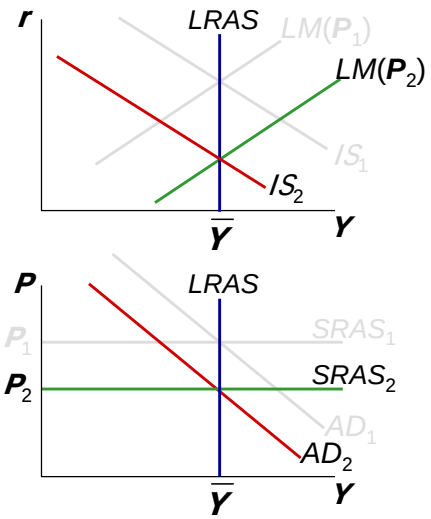


The SR and LR effects of an *IS* shock

This process continues until economy reaches a long-run equilibrium with

$$Y = \overline{Y}$$



EXERCISE: *Analyze SR & LR effects of* ΔM

a. Draw the *IS-LM* and *AD-AS* diagrams as shown here.

b. Suppose Fed increases ***M.*** Show the short-run effects on your graphs.

c. Show what happens in the transition from the short run to the long run.

d. How do the new long-run equilibrium values of the endogenous variables compare to their initial values?