Class 24

Econ 402

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Class 20 Outline

- Algebraic IS-LM-AD
- More on Fixed v. Floating
- Dornbusch Overshooting Model

$$Y = C(Y - T) + I(r) + G$$

where

$$C(Y - T) = a + b(Y - T)$$

$$I(r) = c - dr$$

$$\Rightarrow Y = \frac{a + c}{1 - b} + \frac{1}{1 - b}G + \frac{-b}{1 - b}T + \frac{-d}{1 - b}r$$

Slope is negative and depends on interest elasticity of investment demand

If d is large, flat IS curve.
If d is small, steep IS curve

Policy and IS Curve

- How does the effectiveness of monetary policy depend on the elasticity of investment demand with respect to interest rates? How does it depend on the marginal propensity to consume?

$$M/P = L(r,Y)$$

where

$$L(r,Y) = eY - fr$$

$$\Rightarrow r = \frac{e}{f}Y - \frac{1}{f}\frac{M}{P}$$

Slope depends on the relative sizes of income and interest elasticities of money demand

If e is small, LM is flat
If e is large, LM is steep

If f is small, LM is steep
If f is large, LM is flat

Policy and the LM Curve

- What does the Quantity Theory of Money imply about the LM Curve?
- What does the theory of liquidity preference imply?
- What do the two theories imply about the effectiveness of fiscal policy?

Aggregate Demand

What is the level of income that satisfies equilibrium in both goods and money markets?

$$Y = \frac{a+c}{1-b} + \frac{1}{1-b}G + \frac{-b}{1-b}T + \frac{-d}{1-b}\left(\frac{e}{f}Y - \frac{1}{f}\frac{M}{P}\right)$$

$$\Rightarrow Y = z\frac{a+c}{1-b} + \frac{z}{1-b}G + \frac{-zb}{1-b}T + \frac{d}{(1-b)(f+de/(1-b))}\frac{M}{P}$$

where

$$z = f/(f + de/(1-b))$$

Liquidity Trap

- At zero nominal interest rates, interest rate elasticity of money demand (f) is infinite
- LM curve is flat and monetary policy has no effect on aggregate demand

Money and the Great Depression

- Not an LM shock (real balances didn't fall, but nominal interest rates and output did)
- Deflation could generate a negative IS shock
- Could money have helped?

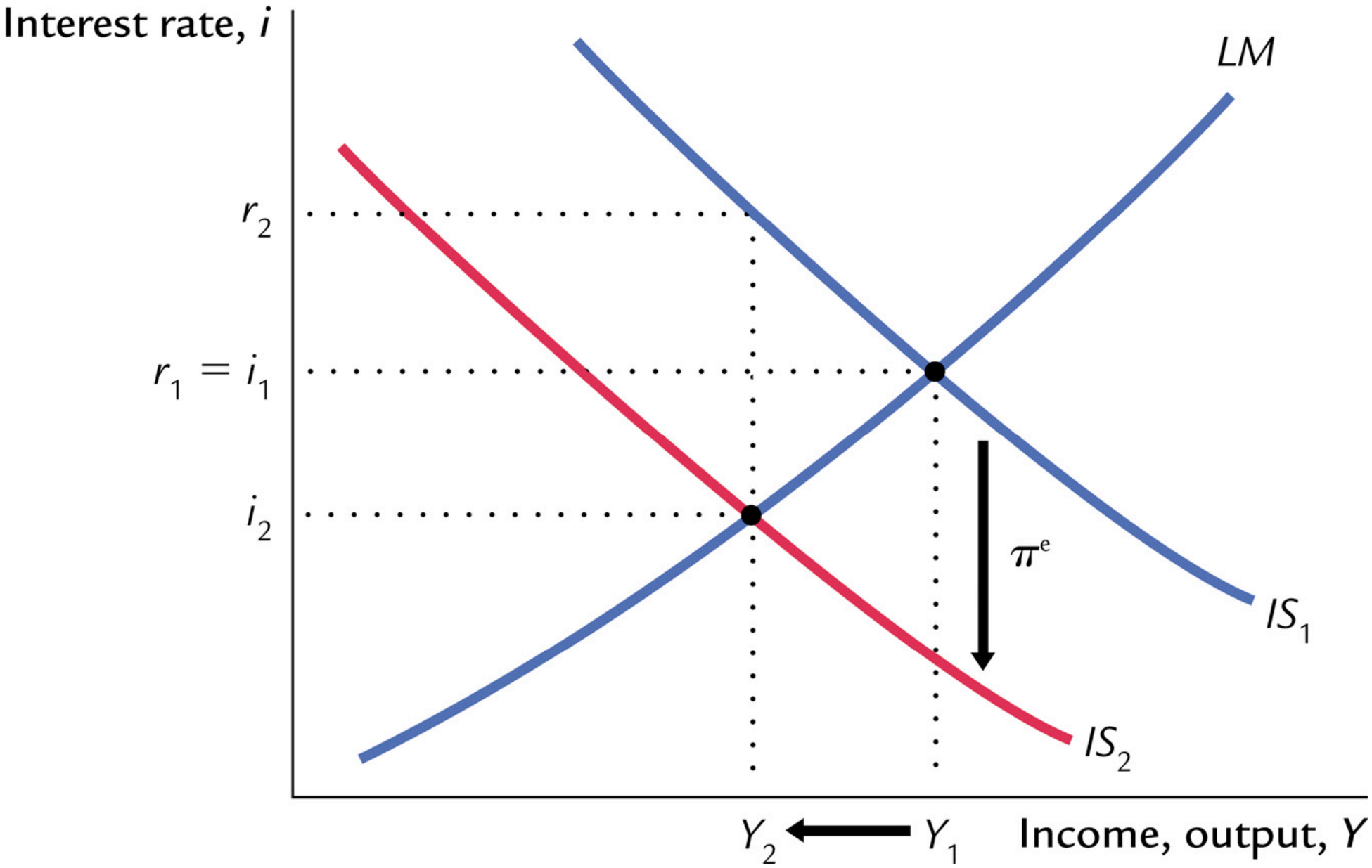

Figure 11.8 Expected Deflation in the IS-LM Model
Mankiw: Macroeconomics, Sixth Edition

TABLE 11-2

What Happened During the Great Depression?

Year	Unemployment Rate (1)	Real GNP (2)	Consumption (2)	Investment (2)	Government Purchases (2)
1929	3.2	203.6	139.6	40.4	22.0
1930	8.9	183.5	130.4	27.4	24.3
1931	16.3	169.5	126.1	16.8	25.4
1932	24.1	144.2	114.8	4.7	24.2
1933	25.2	141.5	112.8	5.3	23.3
1934	22.0	154.3	118.1	9.4	26.6
1935	20.3	169.5	125.5	18.0	27.0
1936	17.0	193.2	138.4	24.0	31.8
1937	14.3	203.2	143.1	29.9	30.8
1938	19.1	192.9	140.2	17.0	33.9
1939	17.2	209.4	148.2	24.7	35.2
1940	14.6	227.2	155.7	33.0	36.4

Source: Historical Statistics of the United States, Colonial Times to 1970, Parts I and II (Washington, DC: U.S. Department of Commerce, Bureau of Census, 1975).
Note: (1) The unemployment rate is series D9. (2) Real GNP, consumption, investment, and government purchases are series F3, F48, F52, and F66, and are measured in billions of 1958 dollars. (3) The interest rate is the prime Commercial

Table 11.2
Mankiw: Macroeconomics, Sixth Edition

Year	Nominal Interest Rate (3)	Money Supply (4)	Price Level (5)	Inflation (6)	Real Money Balances (7)
1929	5.9	26.6	50.6	–	52.6
1930	3.6	25.8	49.3	−2.6	52.3
1931	2.6	24.1	44.8	−10.1	54.5
1932	2.7	21.1	40.2	−9.3	52.5
1933	1.7	19.9	39.3	−2.2	50.7
1934	1.0	21.9	42.2	7.4	51.8
1935	0.8	25.9	42.6	0.9	60.8
1936	0.8	29.6	42.7	0.2	62.9
1937	0.9	30.9	44.5	4.2	69.5
1938	0.8	30.5	43.9	−1.3	69.5
1939	0.6	34.2	43.2	−1.6	79.1
1940	0.6	39.7	43.9	1.6	90.3

Paper rate, 4–6 months, series ×445. (4) The money supply is series ×414, currency plus demand deposits, measured in billions of dollars. (5) The price level is the GNP deflator (1958 = 100), series E1. (6) The inflation rate is the percentage change in the price level series. (7) Real money balances, calculated by dividing the money supply by the price level and multiplying by 100, are in billions of 1958 dollars.

Table 11.2 (continued)

Gold Standard and the Great Depression

- Countries that left the gold standard recovered faster
- Exchange rate transmission, end of deflationary expectations and liquidity trap

Fixed v. Floating

- Fixed? Lower transaction costs (micro); ties hands of activist policymakers (macro); but fixed regimes fail
- Floating? Potentially helps avoid liquidity traps, importing inflation; financial price "shock absorber" for IS shocks by countering effects of sticky prices; but volatile

Exchange Rate Volatility

- Why are exchange rates so volatile?

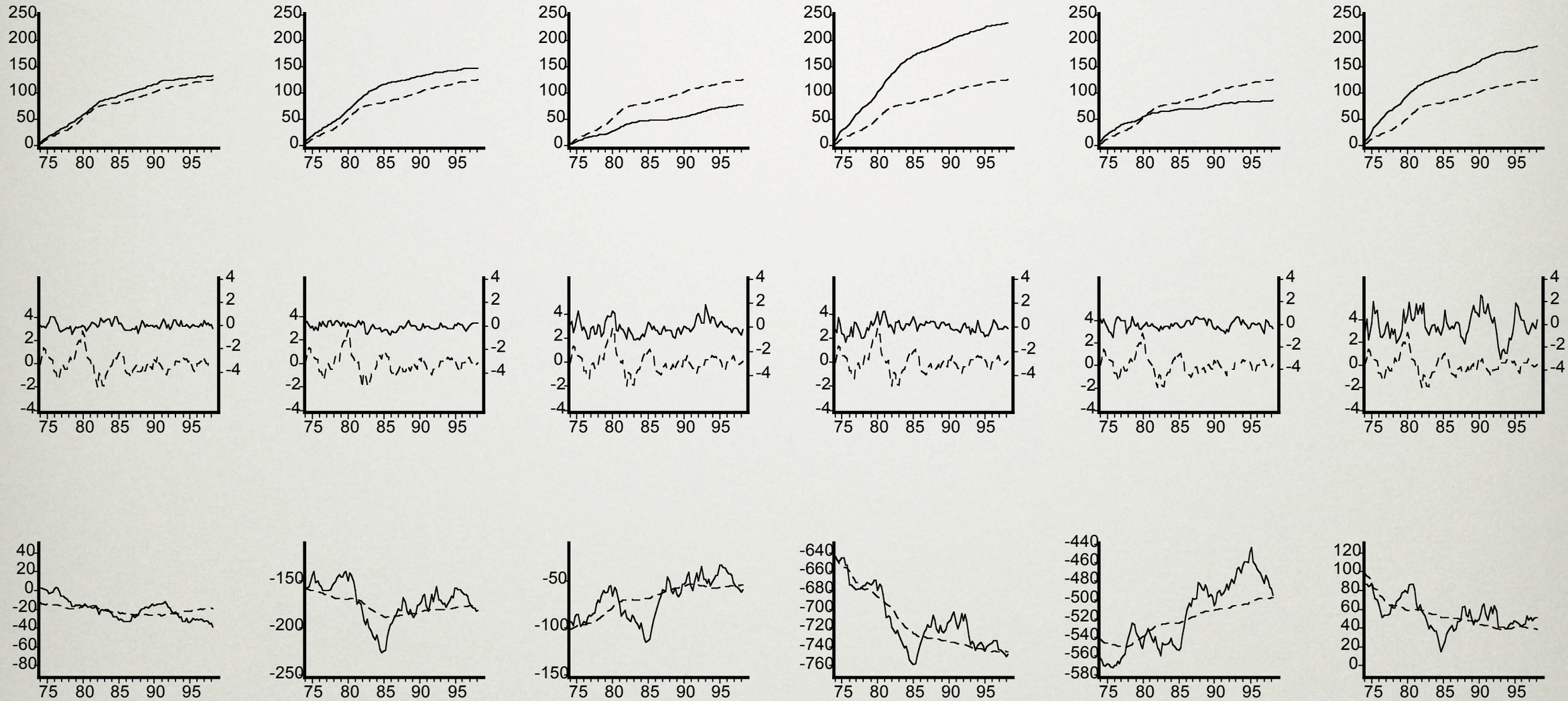

Fig. 2 - Price Components and Exchange Rates for the Seven-Country Model

Dornbusch Overshooting Model

- Perfect capital mobility, rational expectations
  => Uncovered Interest Rate Parity (UIP)
- Sticky Prices and long-run PPP generate exchange rate overshooting to monetary policy shocks

$$r = r^* + \theta$$

Uncovered Interest Rate Parity

$$r_t = r_t^* - E_t[\Delta\varepsilon_{t+1}]$$

$$\Rightarrow i_t - i_t^* = -E_t[\Delta e_{t+1}]$$

If $i_t < i_t^*$, then $E_t[\Delta e_{t+1}] > 0$.

In words, if domestic interest rates are relatively low, then the exchange rate must be expected to appreciate.

Monetary Policy Shock

- In the long run, a permanent increase in M produces a permanent increase in P (Quantity Theory of Money) and a permanent decrease in e (long-run PPP)
- In the short run, when prices are sticky, an increase in M => an increase in M/P => a fall in interest rates => exchange rate is expected to appreciate (UIP)

Predictions

- Exchange rate is a "jump" variable that overshoots its long-run depreciation so that there can be an expected appreciation in order to maintain UIP
- Speed of adjustment of exchange rate appreciation to PPP is determined by stickiness of prices

Reality

- PPP Puzzle: While exchange rates are volatile, as predicted by Dornbusch model, they are too slow to adjust to PPP to be explained by sticky prices
- Also, UIP doesn't seem to hold

- Material also covered in Chapter 5 of Romer in the reading package (Section 5.3)

- Next time: The "Missing Third Equation" (Chapter 13 in Mankiw)