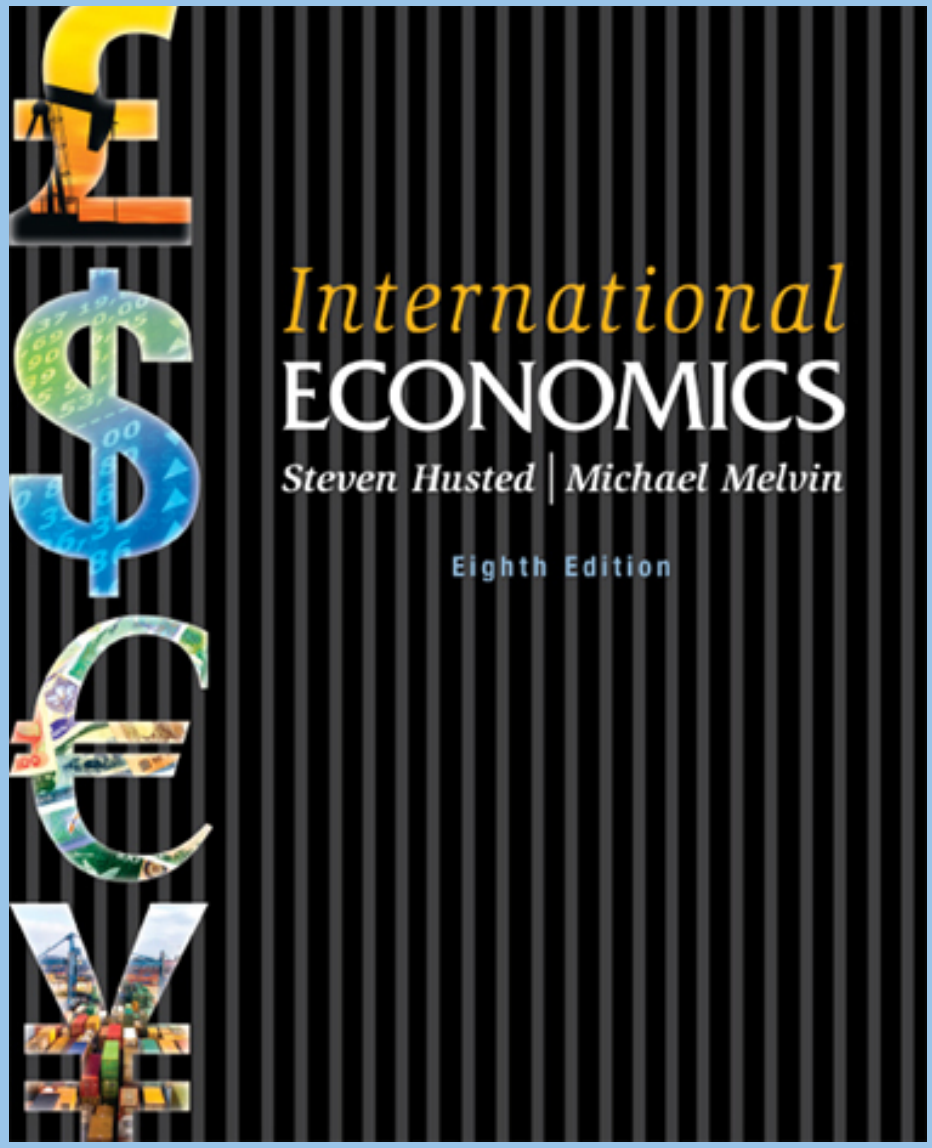
Chapter 18

Exchange Rate Theories (modified version)



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Topics to be covered

Exchange Rate Determination

1. The Elasticities Approach
2. The Asset Approach

2a. The Monetary Approach to the Exchange Rate

2b. The Portfolio Balance Approach

3. Overshooting Exchange Rates
4. Role of News
5. Foreign Exchange Market Microstructure

Understand

- Economic theories help:
- **Understand** the actual behavior of exchange rates in the past
  - *Particular cases*:
  - Why has the CHF appreciated vs the EUR in the last 10 years?
  - Why has it appreciated vs the USD in the last 50 years?
  - *General patterns* (less ambitious):
  - Why are exchange rates more volatile than the general price level
  - Why the nominal and real exchange rate comove strongly positively

Forecast

- **Forecast** rates in the future over various forecasting horizons (short-long); their level, direction (turning points), volatility, …

- Forecasting and understanding may not coincide: Understand without being able to forecast or forecast without understanding (technical analysis).

Fundamental principle

- Starting point:

Fundamental principle in economics for thinking about the determination of any price, p: Demand and Supply

- p: D(p) = S(p)

- The exchange rate is the price of foreign exchange, FE
- It is determined by:
- Demand for foreign currency = Supply of foreign currency

Demand and Supply of FE

- What are the determinants of the demand and supply of foreign currency?
- Are they the same in the short and the long term?
- Different theories emphasize different sets of determinants. Their relevance may differ across different horizons, periods, countries,...

Trade based (elasticities)

- Demand and supply of FE derive from the current demand for and supply of imports and exports

- Those in turn depend on domestic, Y, and foreign, Y*, incomes and on the relative price (cheapness) of domestic goods in terms of foreign goods, q (q=s*p*/p)

q: D(q, Y) = S(q, Y*)

- From q and given p and p* get s.
- The emphasis is on trade elasticities

Elasticities

- **Main shortcoming of theory:** Ignoring capital movements (which dwarf trade flows nowadays).
- Trade flows are too smooth in the short run to account for the observed large short term real, q, (and nominal, s) exchange rate volatility.
- The theory may make more sense in the determination of the long term *real* exchange rate.
- How? In the long run: Foreign accounts must balance (a country cannot run a CA deficit or surplus indefinitely; this limits the size of the trade deficit). The real exchange rate, q is determined by this requirement.

Trade

Long run q^{LR}: $CA = TB(q^{LR}, Y^{LR}, Y^{LR*}) + NI^{LR} = 0$

Long run prediction: Countries that have been running sustained trade deficits ("borrowing" from abroad, that is, external debt) will eventually have to experience a currency depreciation in order to make their products more competitive and thus generate future trade surpluses in order to pay back their external debt.

Examples: Greece, USA

The Asset Approach

- The exchange rate is determined by the relative demand and supply of domestic and foreign financial assets.
- An implication of this approach is that exchange rates are more variable –like other asset prices- than goods prices. See Table 18.1.
- The asset approach mostly assumes perfect capital mobility, that is, no barriers to international capital flows.

TABLE 18.1 Standard Deviations of Prices and Exchange Rates[1]

Country	Price	Exchange Rate
Canada	0.014	0.051
Japan	0.012	0.115
United Kingdom	0.019	0.071

[1]The table reports the standard deviations of the percentage changes in the consumer price index and the spot exchange rate of each country's currency against the U.S. dollar for the period 1985 to 2007.

Asset Approach Models

- The exchange rate is determined by relative
- **Monetary Approach to the Exch. Rate**
- money demand and money supply between two countries (see Chapter 17).
- Example: Quantitative easing in the US, Japan and the Eurozone.
- **Portfolio Balance**
- supplies and demands of domestic and foreign bonds.
- Example: CHF appreciation during EZ debt crisis

Monetary vs. Portfolio Balance

- The main difference between the two approaches is that the monetary approach only examines money; this is because it assumes that domestic and foreign bonds are perfect substitutes (IRP holds perfectly)
- The portfolio balance model assumes they are not, so relative supplies matter.
- See Table 18.2

TABLE 18.2 The Asset Approach to the Exchange Rate

Characteristic	Monetary Approach	Portfolio-Balance Approach
Perfect capital mobility (implies covered interest rate parity)	Yes	Yes
Domestic and foreign bonds perfect substitutes (implies uncovered interest rate parity and no foreign-exchange risk premium)	Yes	No

Monetary Approach (MAER)

- The D and S of FE derives from D and S of domestic and foreign money (s is the relative price of monies rather than goods).

s(t):

$M(t)/p(t) = F(i(t), y(t))$ (home)

$M^*(t)/p^*(t) = F(i^*(t), y^*(t))$ (foreign)

- The relevant factors for s are the determinants of the supply of and demand for money.

Monetary approach contd

- Important assumptions:
- All prices are flexible (vertical aggregate supply; y and y* do not depend on M, M*).
- Domestic-foreign goods are perfect substitutes (PPP):
- $p(t) = s(t)p^*(t)$.
- Domestic and foreign assets are perfect substitutes (IRP):
- $i(t) - i^*(t) = E\, s(t+1) - s(t)$,
- Fisher equation
- $i(t) = r(t) + E\, p(t+1) - p(t)$, $r = r^*$ given

Implications:

- $M^S \uparrow \quad s\uparrow$ (depreciation)
- $M^S \uparrow i \uparrow s\uparrow$ (depreciation)
- $y\uparrow \; s\downarrow$ (appreciation)
- *In words*: Countries that have high rates of money growth have high inflation, high nominal interest rates and experience a currency depreciation; that grow fast ($y\uparrow$) experience currency appreciation.
- Explanation: Things that increase (decrease) money demand lead to appreciation (depreciation). Things that increase (decrease) money supply lead to depreciation (appreciation).

MAER contd

- Contrast to the prediction of the Keynesian model (IS-LM)
- M ↑ i ↓ s ↑
- Understand the source of disagreement:

i: Fisher equation: $i = r + E\pi$

- Sources of variation in i
- Inflation expectations vs the real interest rate
- With sticky prices i ↑ means r ↑. Domestic currency becomes more attractive, s ↓

MAER (cont.)

- **Empirical evidence**
- The monetary approach gives good results
- 1. when inflation is high
- 2. in the long run

- Example: The USD/DM or USD/CHF or IL/DM,... in the last 50 years. Sustained depreciation

- But in the short run, in low inflation countries, i ↓ s ↑ (the recent exch. Rate experience)

Overshooting Exchange Rates

- Since exchange rates are more volatile and adjust more quickly than goods prices, this differential speed of adjustment can lead to a situation where exchange rates reverse course and end up being very volatile
- This is a case of **overshooting exchange rates**.

- Use IRP and long run PPP to understand overshooting

Overshooting Exchange Rate Model

- Money demand (L) is positively related to income Y and negatively to interest rate i:

$$L = aY + bi \qquad (18.13)$$

- In the short run, as money supply increases, income and price level are constant. Consequently, interest rates must fall to equate money demand and money supply.

Overshooting XR Model (cont.)

- The drop in interest rate will have a direct effect on the exchange rate via the interest rate parity relation:

$$i_A - i_B = (F - S)/S$$

- With the increase in money supply in country A, prices will be expected to rise. This higher future price will imply a higher long run exchange rate to achieve PPP:

$$S_{LR} = P_A / P_B$$

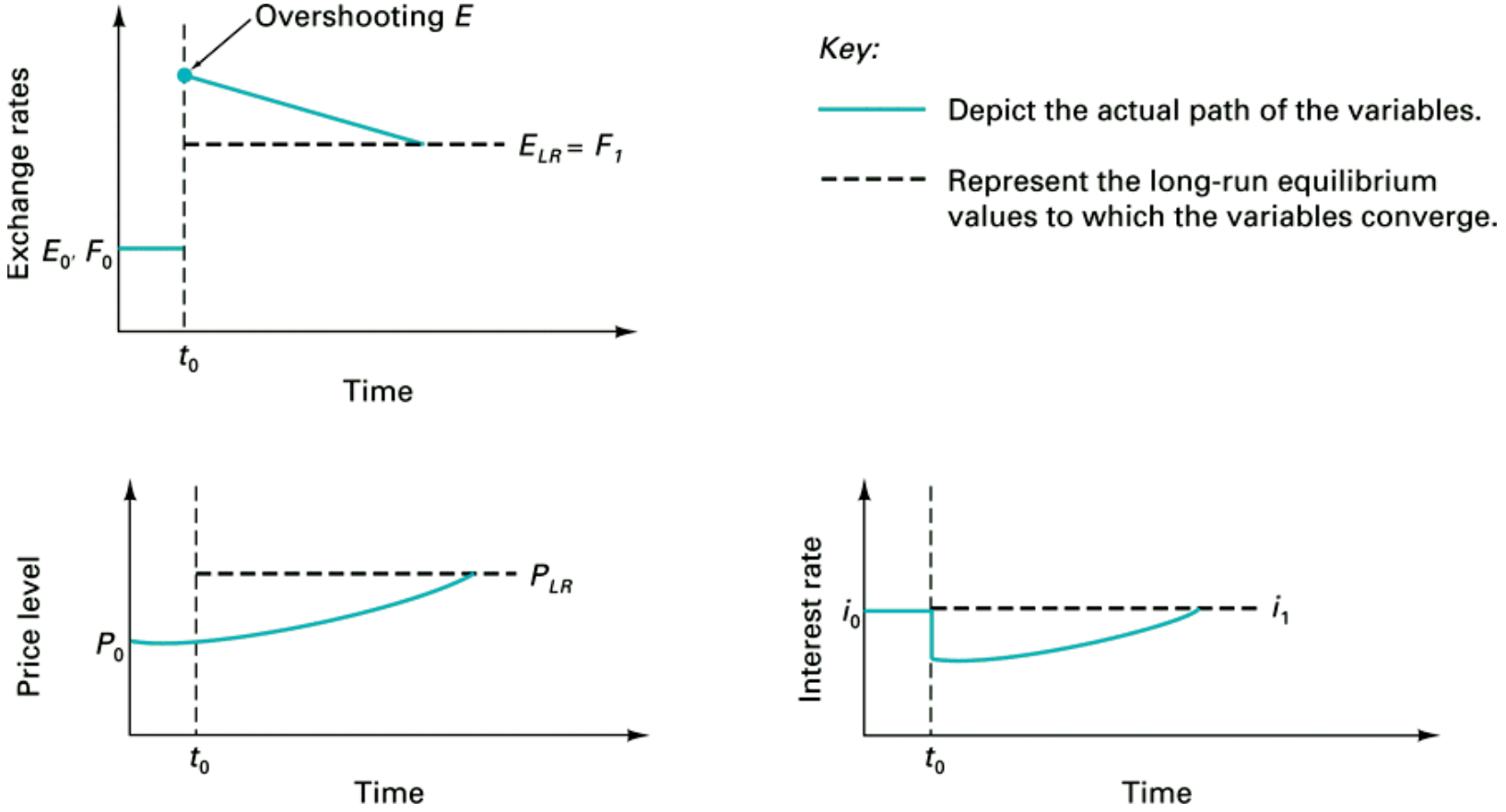
Overshooting XR (cont.)

- The spot exchange rate will increase above the long run equilibrium exchange rate due to a need to maintain interest parity.
- Over time, as prices increase, the interest rate rises, and the exchange rate converges to its new equilibrium level.
- Refer to Figure 18.2

Overshooting XR : Implications for Int'l Competitiveness

- **Monetary policy, the exchange rate and international competitiveness**
- A central bank may be able to manipulate the real exchange rate (sp^*/p) in the short run if prices are sticky.
- In this case, if $i \downarrow$, $r \downarrow$ $s \uparrow$, $sp^*/p \uparrow$ i.e. relatively cheaper domestic goods.
- Can't do it in the long run

FIGURE 18.2 The Time Path of the Forward and Spot Exchange Rate, Interest Rate, and Price Level after an Increase in the Domestic Money Supply at Time t_0



THE BALASSA-SAMUELSON (B-S) HYPOTHESIS

- Fast growing countries should experience a real (s p*/p) exchange rate appreciation
- Rich countries will have higher prices for non-traded goods (haircuts, meals, theater tickets,..) than poor countries
- Theory: Cross country differences in productivity growth in traded goods industries relative to non-traded goods industries
- Higher productivity implies higher wages and hence higher nontraded goods prices

B-S cont'd

- Real appreciation and implications for international competitiveness
- Does the experience of a country like Greece fit to the B-S framework?
- Productivity growth vs government spending. Government spending is concentrated mostly on domestic non-traded.

The Role of News

- The real world is characterized by unpredictable shocks or surprises. As such, predicting future spot rates is difficult because the exchange rate is partly determined by unforeseen events.
- Exchange rates are more sensitive, and respond more quickly, to expectations and new information (e.g., unemployment rates).

Foreign Exchange Market Microstructure

- At the micro level, exchange rates can be determined by interactions among traders.
- A foreign exchange trader may be influenced to change his exchange rate quotes even in the absence of news regarding exchange rate fundamentals.

FEM Microstructure Effects

- **Inventory control effect**—traders will want to have no inventory at the end of the day, so that their quotes reflect this desire.
- **Asymmetric information effect**—traders fear that they are trading with agents who have better information than they do.

Other theories

- Animal spirits, speculative bubbles
- Emphasis on arbitrary -perhaps self-fulfilling- expectations of market participants

General remarks

- A broad distinction: Fundamentals vs non-fundamentals (arbitrary beliefs, beliefs about the beliefs of others, etc..)
- Most models focus on macroeconomic fundamentals (inflation, output growth, trade balance...)
- Fewer focus on microeconomic behavioral fundamentals (strategic interactions between traders, informational asymmetries, heterogeneous beliefs...)