

# 4<sup>th</sup> session

17th March 2016

- Empirical tests of the parity conditions
  - Covered Interest Parity
    - The premium must be approximately equal to the interest rate differential
    - All variables are directly observable.
    - Need to use compatible financial assets when comparing the interest rates (maturity and risk). For example, assets that are issued by the same institution but in different currencies so that the only risk is foreign exchange risk.
    - Findings: without capital controls, parity tends to hold.
    - Transactions cost, differential taxation across countries on the returns from investing in financial markets, and political risk involved in investing in different countries justify deviations from CIP. However, these deviations are small enough to assume that CIP holds true.

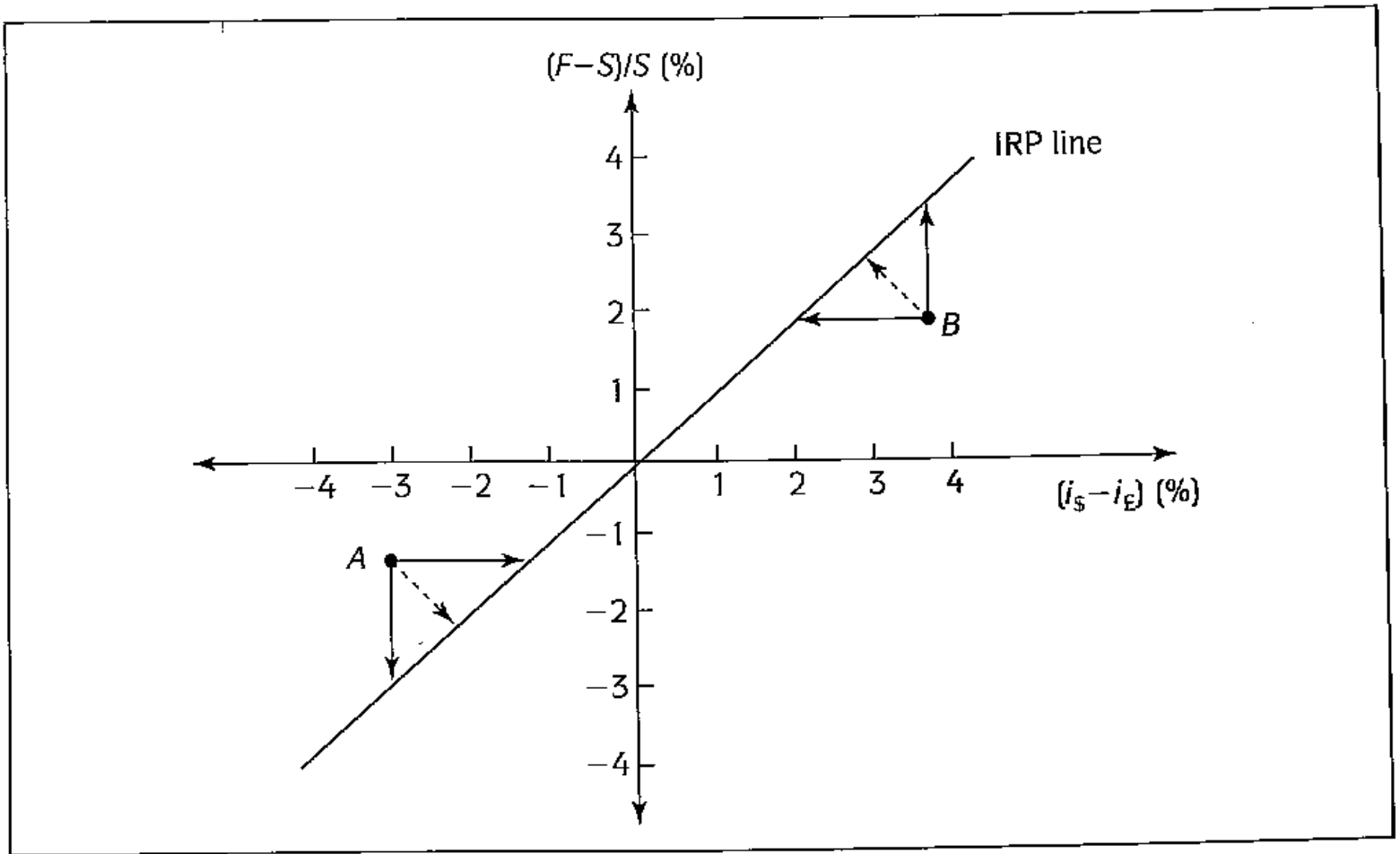
- Transaction Costs

- Taking the case when it compensates to borrow in N to invest in J:  
 $(1+i_j).F(j/n)/S(j/n) - (1+i_N) > 0$

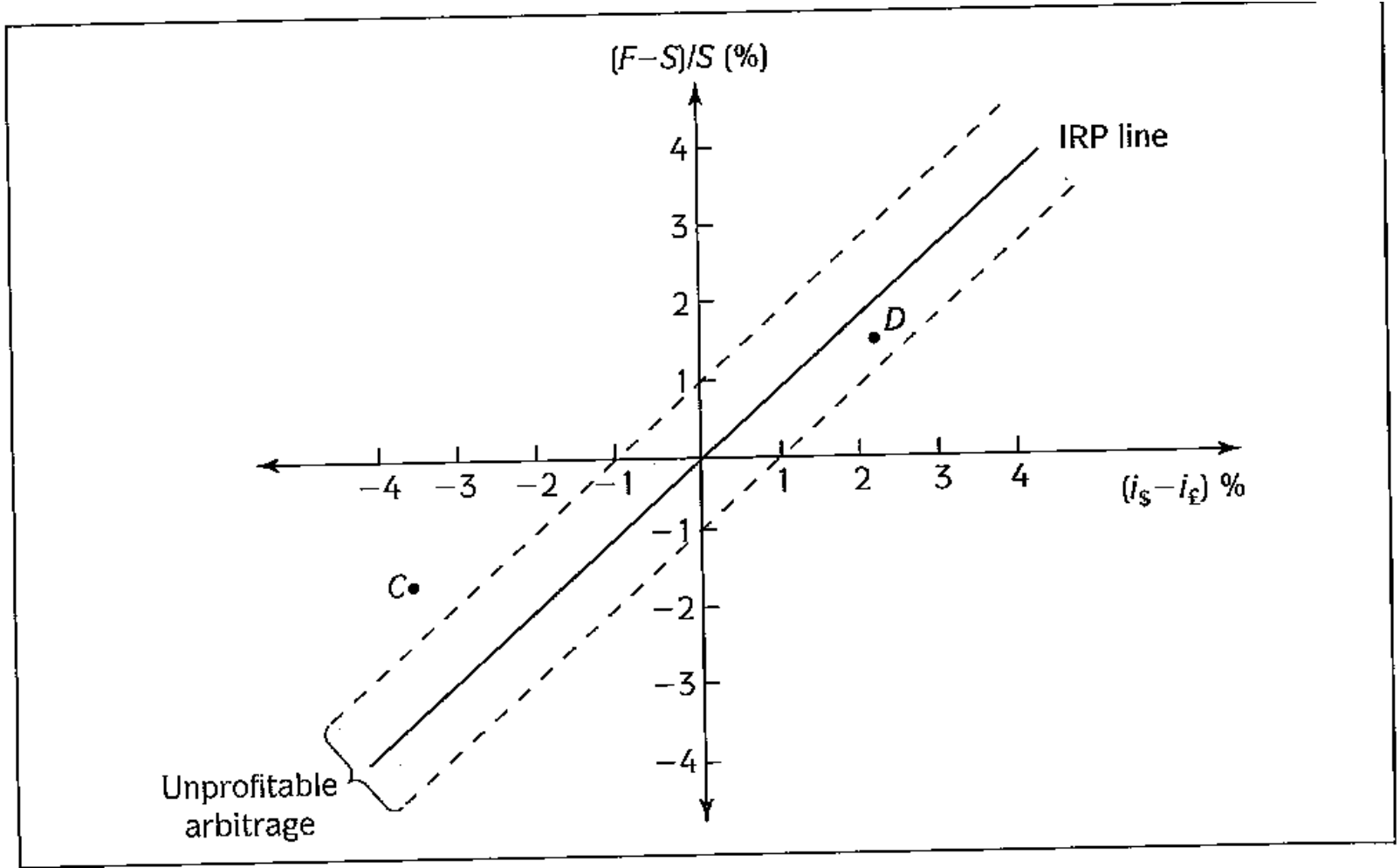
- The arbitrageur borrows at  $i_N^a$  and invests at  $i_j^b$

Also, he purchases currency j spot at a foreign exchange rate  $S(j/n)^a$ , and sells it forward at  $F(j/n)^b$ .

- This reduces profits.



The Interest Rate Parity Diagram



**Interest Rate Parity  
with Transaction Costs**

## ■ Uncovered Interest Rate Parity

- The expected appreciation rate of the currency must be approximately equal to the interest rate differential.
- A higher interest rate in one country is compatible with an expected depreciation of that country's currency.
- Not all the variables are directly observable: the expected foreign exchange rate.
- Solutions:
  - Ask.
  - Examine actual returns on uncovered international investments. If expected uncovered returns are usually (on average) at parity, over a large nr of investments the actual uncovered differentials should be approximately zero on average. Frequently, this is not found.

- Studies - UIP does not hold in the data especially for the industrialized countries. Percentage change in expected future spot rate is not equal to interest differential.
- If the two parity conditions hold, then  $F_{t,t+h} = S_{t,t+h}^e$ .
- Explanations for deviations from UIP:
  - **Expectations** Investors are systematically making mistakes in predicting the future value of spot exchange rate. Why especially over longer time periods do investors make big mistakes in a systematic fashion? Over time at least errors should shrink so that deviations from UIP became smaller.
  - **Risk aversion:** there should be a premium to take a risk by not covering the investment. UIP takes into account only expected return.

Uncovered Interest Differential =  $f(\text{risk}, \text{riskaversion})$

- **Limited participation** in the FX market: only a subset of potential investors is active in a given period.

increase in the interest rate of a particular currency → increase in demand for that currency → appreciation of the currency.

But when investors change infrequently their international portfolio positions, they will gradually buy the currency as time goes on, with a gradual appreciation. Meanwhile, deviations exist.

Most of the international portfolios held over the medium run belong to institutions or individuals that are not active in the foreign exchange market.

- Problems in the **statistical analysis** of the data.

Olmo e Pilbeam, UNCOVERED INTEREST PARITY AND THE EFFICIENCY OF THE FOREIGN EXCHANGE MARKET: A RE-EXAMINATION OF THE EVIDENCE *Int. J. Fin. Econ.* (2010)

POSSIBLY, a COMBINATION of FACTORS.



# Presentation of the paper

Hauner, Lee and Takizawa 2010, *In which Exchange Rate models do forecasters trust?*, IMF WP 11/116

By RUI COSTA and TELMA FRUTUOSO

# Monetary model with sticky prices and expectations (Dornbusch 1976) – From SR to LR



*Pugel, chap.18*

- Hybrid :Long Run/ SR model.
- New elements: sticky prices of goods in the SR. Only in LR- PPP: the foreign exchange rate and the interest rates are more volatile than the other variables.
- $M^S = P.L(i, Y)$
- UIP permanently holds .  
(approximately) Expected depreciation rate =  $i - i^*$
- Regressive Expectations  $E(S_{t+1}) = \alpha \cdot S_{LP} + (1 - \alpha) \cdot S_t$  or Rational Expectations
- Full employment.

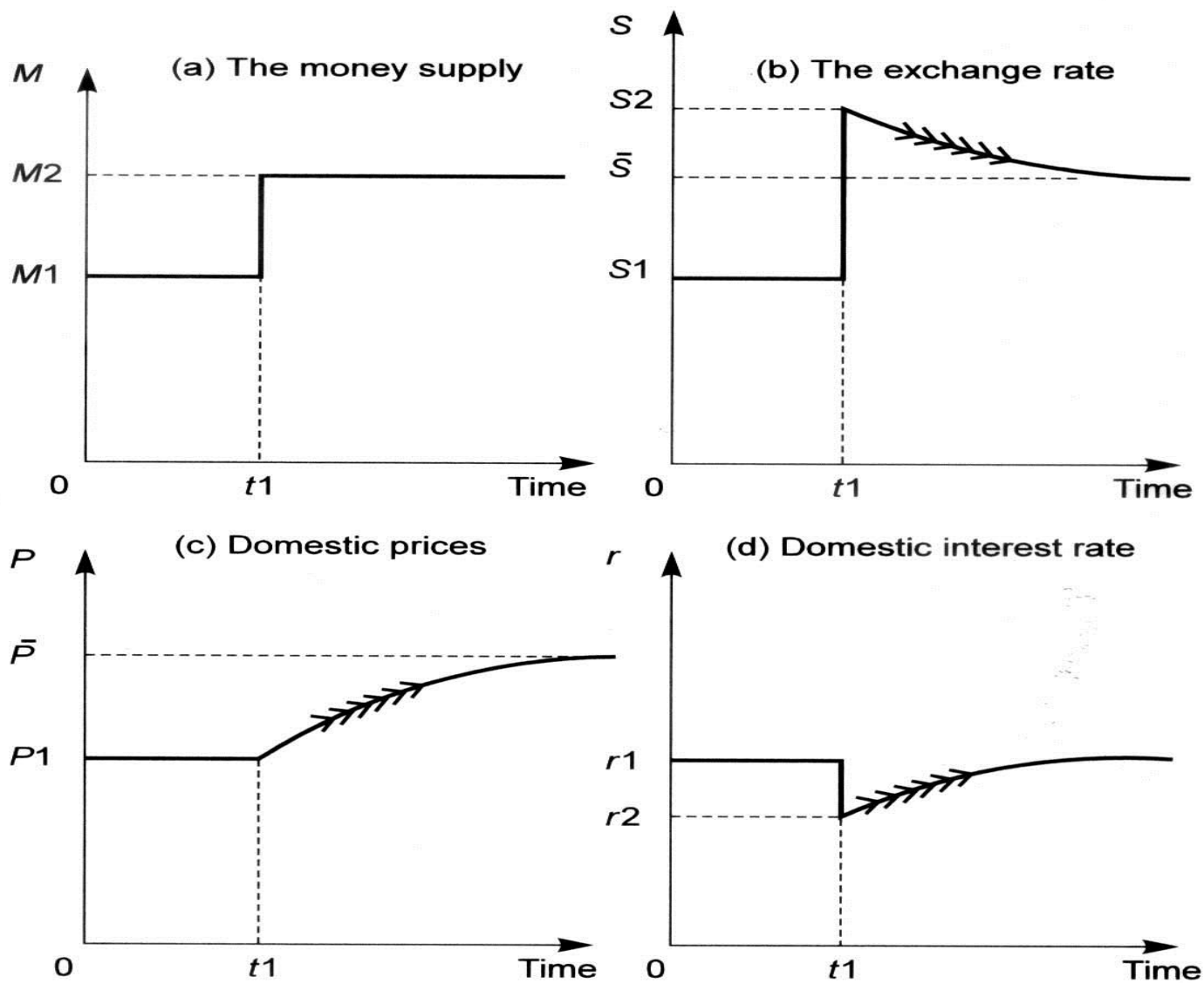


Figure 7.2 *The dynamics of the Dornbusch overshooting model*

- Expansion of  $M^s \rightarrow$  (sticky P)  $M^s/P$  increases.  $\rightarrow$  interest rate decreases.
- Capital outflows and currency depreciates. (**departure from PPP**)
- Investors know that this currency depreciation is not lasting. According to the UIP, if  $i - i^* < 0$ , that must be compensated by an expected appreciation. (foreign exchange rate overadjusted)
- In the LR, P start rising, as a consequence of the rise in demand. (The demand rises because of  $\downarrow i$  and because of the currency depreciation) .
  - $\nearrow P$  will reestablish PPP.
  - $\nearrow P \rightarrow \downarrow M^d/P \rightarrow \nearrow i$
  - The currency slowly appreciates to its LR values.

- This model shows how the foreign exchange rate may be highly volatile in the SR, even converging to the PPP in the LR.
- Movements apparently inconsistent with the fundamentals may be part of LR sensible adjustment process. Exchange rate volatility is needed to temporarily equilibrate the system in response to monetary shocks

## Exercise

- In the discussion of short-run exchange rate overshooting, we assumed that real output was given (fixed). Assume instead that an increase in the money supply raises real output in the short run. How does this affect the extent to which the exchange rate overshoots when the money supply first increases?

# Forward-looking nature of Exchange Rates

- Quantity Theory oriented models

Exchange Rate – passive role of balancing the Money Market; No role for Exchange Rate expectations.

- Expectations oriented asset-market models

Spot Exchange rate adjusts to events that have not materialized but are already anticipated.

(The same as the prices of other assets)

UNANTICIPATED vs ANTICIPATED changes



News

## Exercise

- In the discussion of short-run exchange rate overshooting, we assumed that real output was given (fixed). Assume instead that an increase in the money supply raises real output in the short run. How does this affect the extent to which the exchange rate overshoots when the money supply first increases?



- Meese & Rogoff (1983) Empirical exchange rate models of the seventies: do they fit out the sample?, *J. International Economics*, 14, pp.3-74