EC 380: Lecture 17

Global Finance: Exchange Rates SR-Med

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Prologue

Recap

- Exchange rates determine price of foreign goods

- Numerous reasons to hold foreign reserves

- Shifts in exchange rates often mirror changes in demand and supply of currencies

- PPP holds only in LR

Today

- SR, Medium exchange rates and ExR Systems

Topics

- Reasons for holding foreign reserves, main institutions

- Effect of $\Delta S, \Delta D$ of foreign currency on home currency

- **Identify short, medium and long term forces that affect currency value**

- Three rules of gold standard

- Compare and contrast various exchange rate systems

- Price changes and real exchange rate interactions

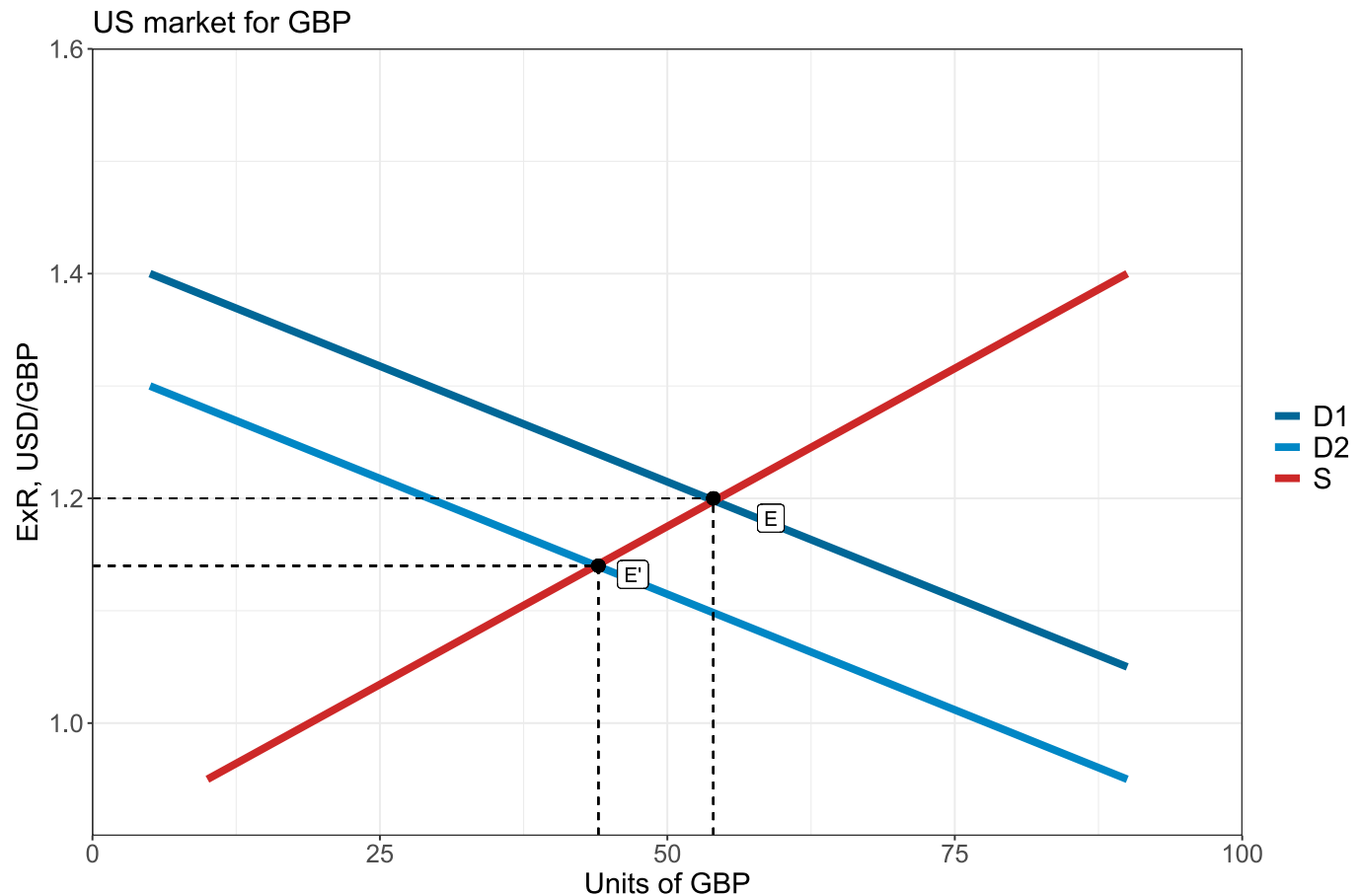- List conditions necessary to form single currency area
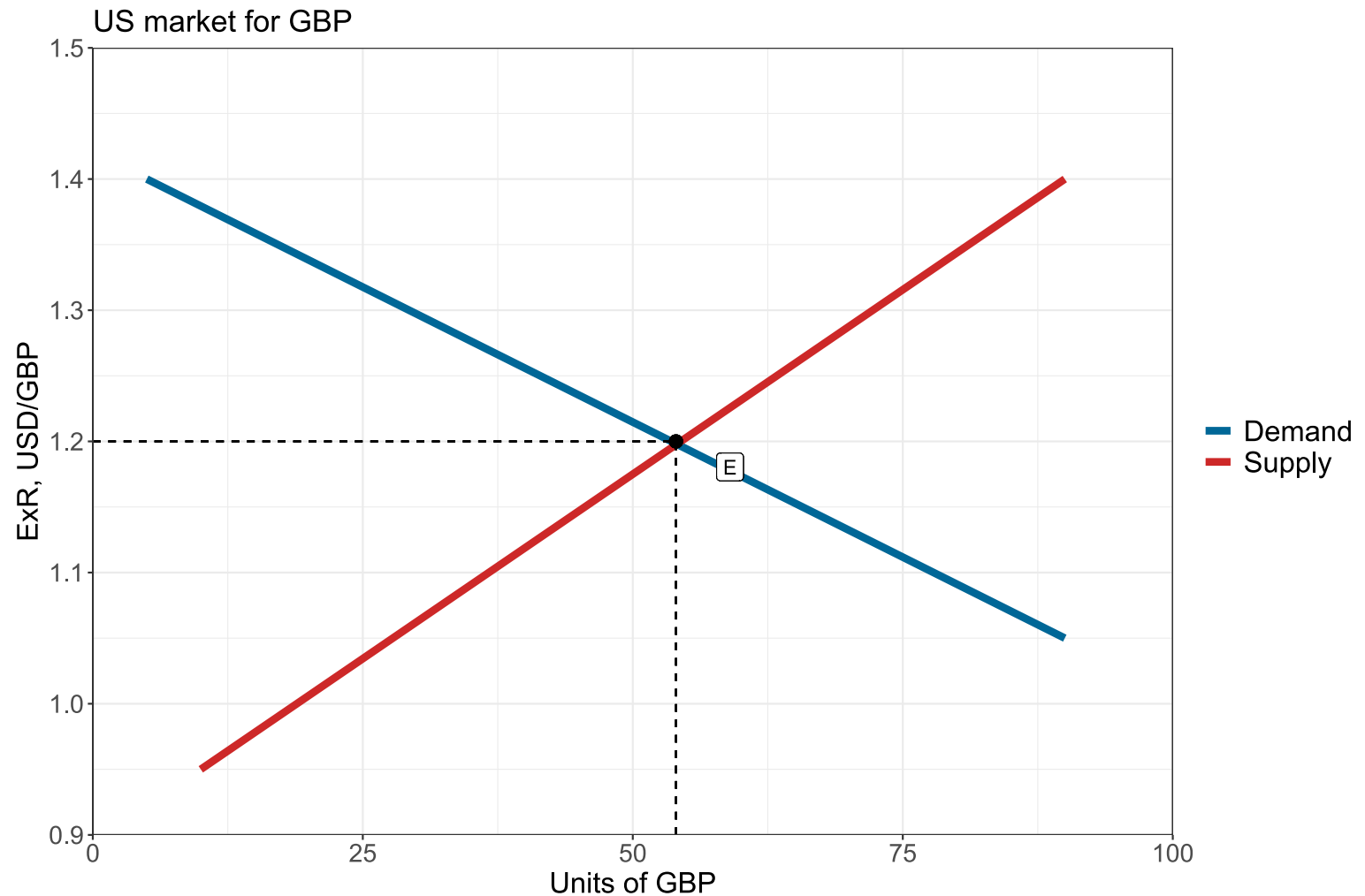
US market for GBP

FX Market: Flexible

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Decreased demand for GBP in USA (D2 ← D1)

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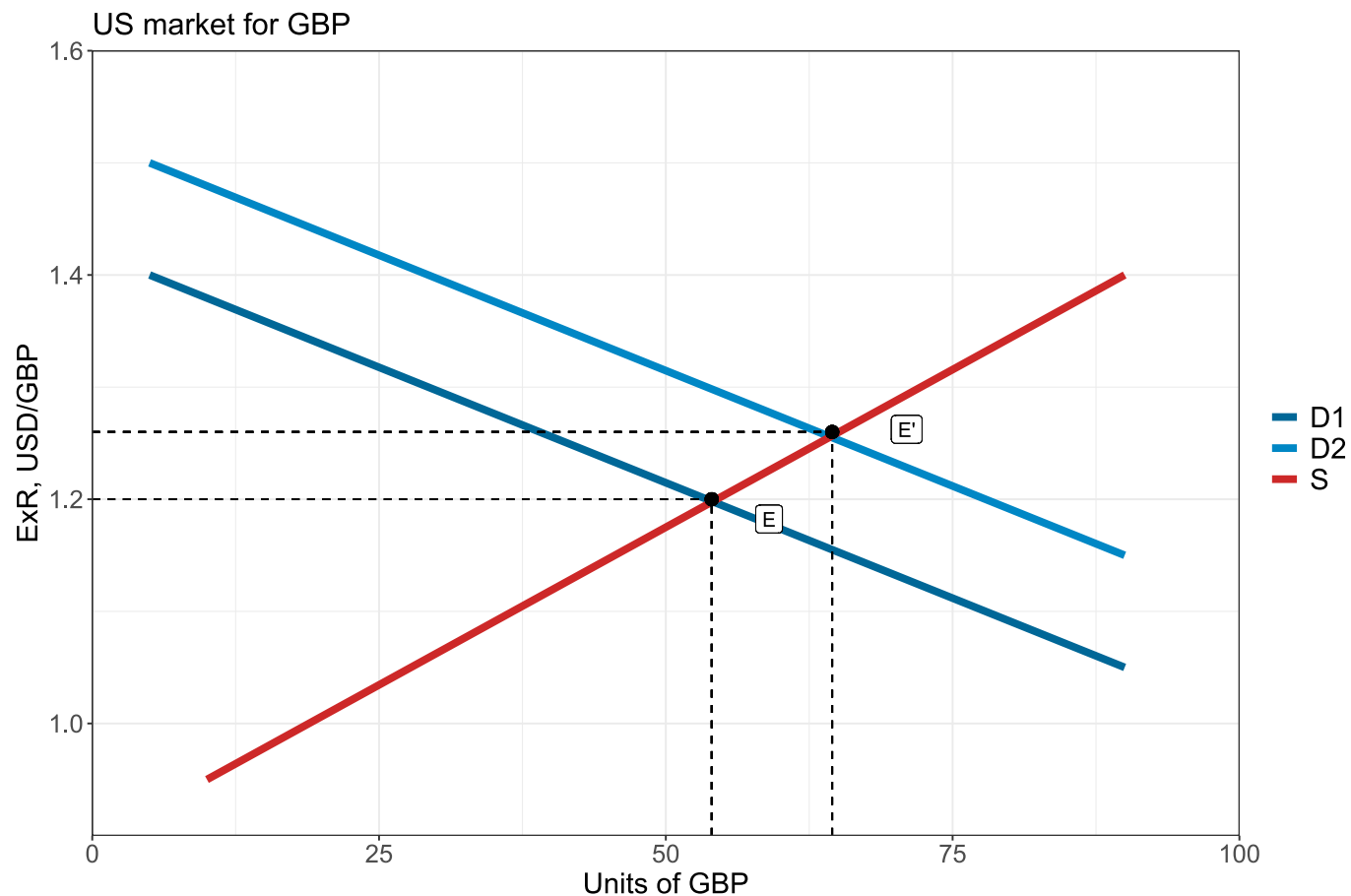
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This implies a greater need for foreign currency.

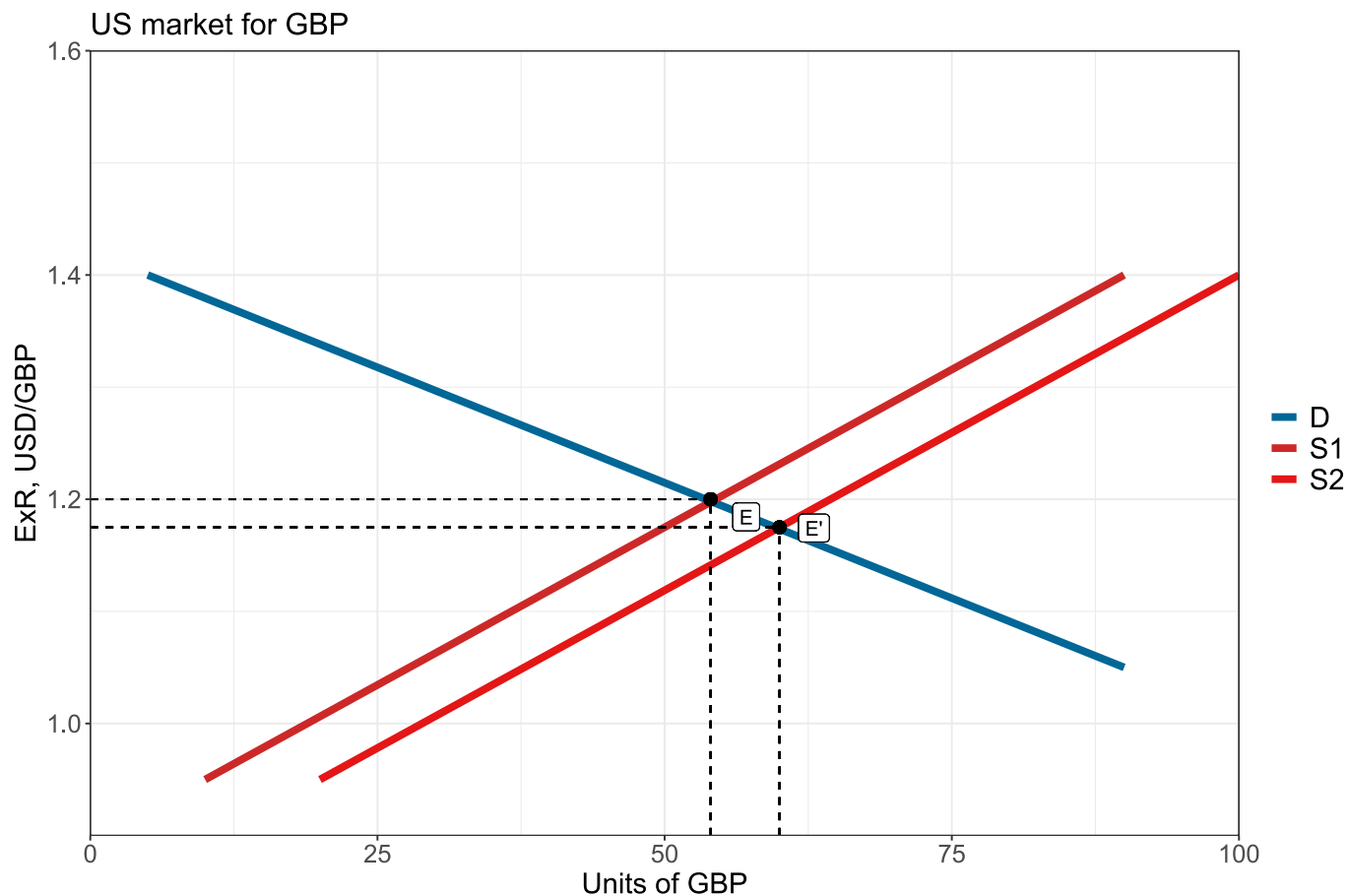# FX Market: Medium Run

Increased demand for GBP in USA (D1 → D2)

FX Market: Medium Run

Suppose UK sees economic boom, increased import of US goods, higher GBP reserves (S1 → S2)

FX Market: Short Run
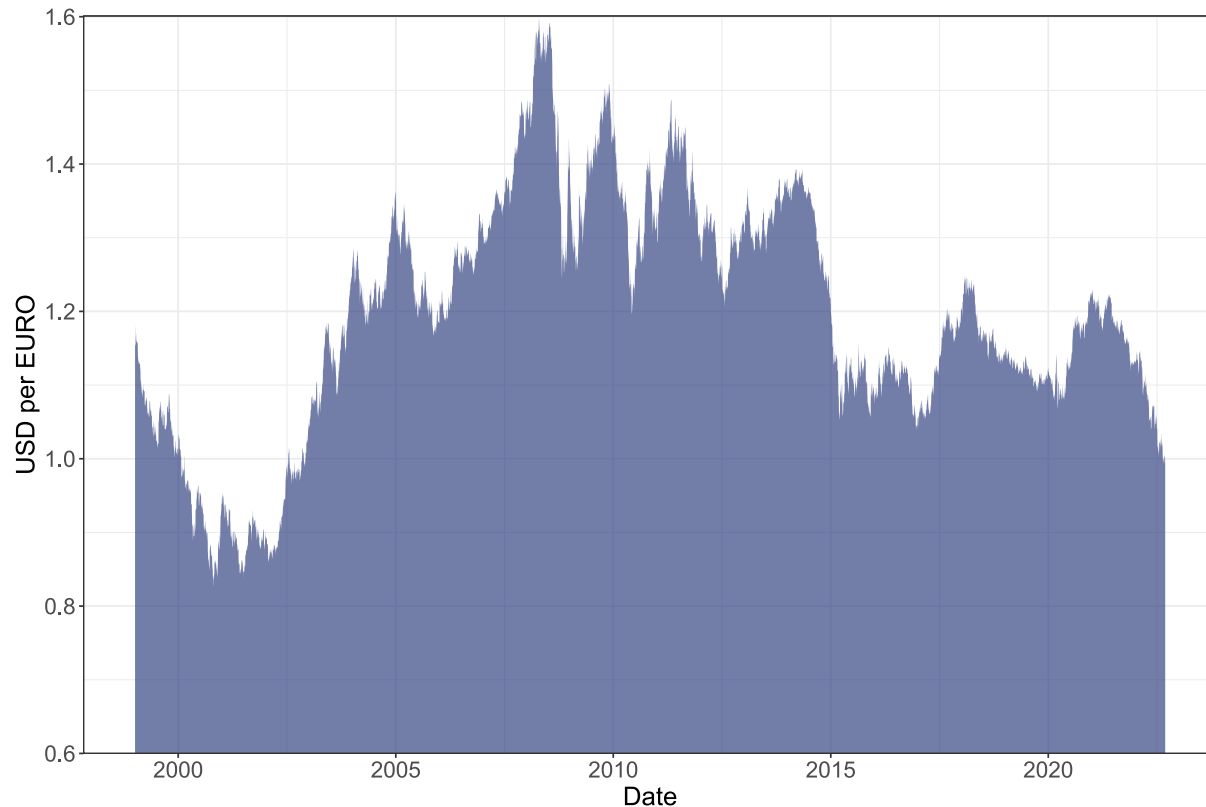
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We observe continuous day-to-day fluctuations in exchange rates.

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- Speculation, driven by exogenous shocks to the state of the economy (e.g. political scandal in Brazil, discovery of natural gas deposits off Cypriot coast, COVID outbreak at Chinese ports)

This latter cohort contribute to a mechanism known as **price discovery** in exchange rates.

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If correct, currency moves towards equilibrium and speculators are rewarded through arbitrage profits.

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These stakes deliver a strong incentive to make the correct decision, bolstering the speed of market adjustments in the process.

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$$i - i^* = \frac{(F - R)}{R}$$

where i is the home interest rate, i^* is the foreign interest rate, F is expected future exchange rate and R is the current exchange rate.

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Suppose the 1-year US bond has a price of 1000 USD.

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$$\mathbf{P} \times (1 + i)^n$$

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German bond requires careful thoughts.

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Suppose exchange rate today is **1.2 USD per EUR**.

Investor can buy **833.33 EUR** in exchange for **1000 USD**.

$$\text{EUR bond} = 833.33 \times (1.02)^1 = 850 \text{ EUR}$$

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Expect return of foreign investment: $i' = \left[\frac{E(F)}{R} \times (1 + i^*) \right] - 1$

Compare i and i' to decide investment!

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Market moves towards interest rate parity $i - i^* = \frac{(F-R)}{R}$

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Let us return to our previous example to see this in action.

FX Market: Interest Parity

US bond, USD	German bond, EUR	F (USD per EUR)	German bond, USD	Purchase
1030	850	0.7	595	US
1030	850	0.8	680	US
1030	850	0.9	765	US
1030	850	1.0	850	US
1030	850	1.1	935	US
1030	850	1.2	1020	US
1030	850	1.3	1105	German
1030	850	1.4	1190	German
1030	850	1.5	1275	German
1030	850	1.6	1360	German
1030	850	1.7	1445	German
1030	850	1.8	1530	German
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Think of GBP market, expect USD to **appreciate** under these conditions.

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A change in expectations about future exchange rates can lead to a similar change in the spot rate.

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2) Uncovered interest parity (UIP)

> Assume investor accepts risk involved and purchases with E(F) in mind.

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In that case, investors are **indifferent** between either bond since their real returns are the same.

Allows us to pin down the F necessary to achieve CIP

$$F_{\text{USD/EUR}} = R_{\text{USD/EUR}} \frac{1 + i}{1 + i^*}$$

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We can calculate today's spot rate if we know market expected exchange rate and these two respective interest rates.

Evidence of UIP

Taking both our previous equations, and dividing one into the other on **both sides**.

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Under the assumption of both types of investors (risky and riskless) exhausting all arbitrage opportunities, expected exchange rates should be equal to forward exchange rates.

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Using previous equation, test described as checking whether the **expected rate of depreciation** is equal to the **forward premium**

$$\underbrace{\frac{F_{\text{USD/EUR}}}{R_{\text{USD/EUR}}} - 1}_{\text{Forward Premium}} = \underbrace{\frac{E(F)_{\text{USD/EUR}}}{R_{\text{USD/EUR}}} - 1}_{\text{Expected Rate of Depreciation}}$$
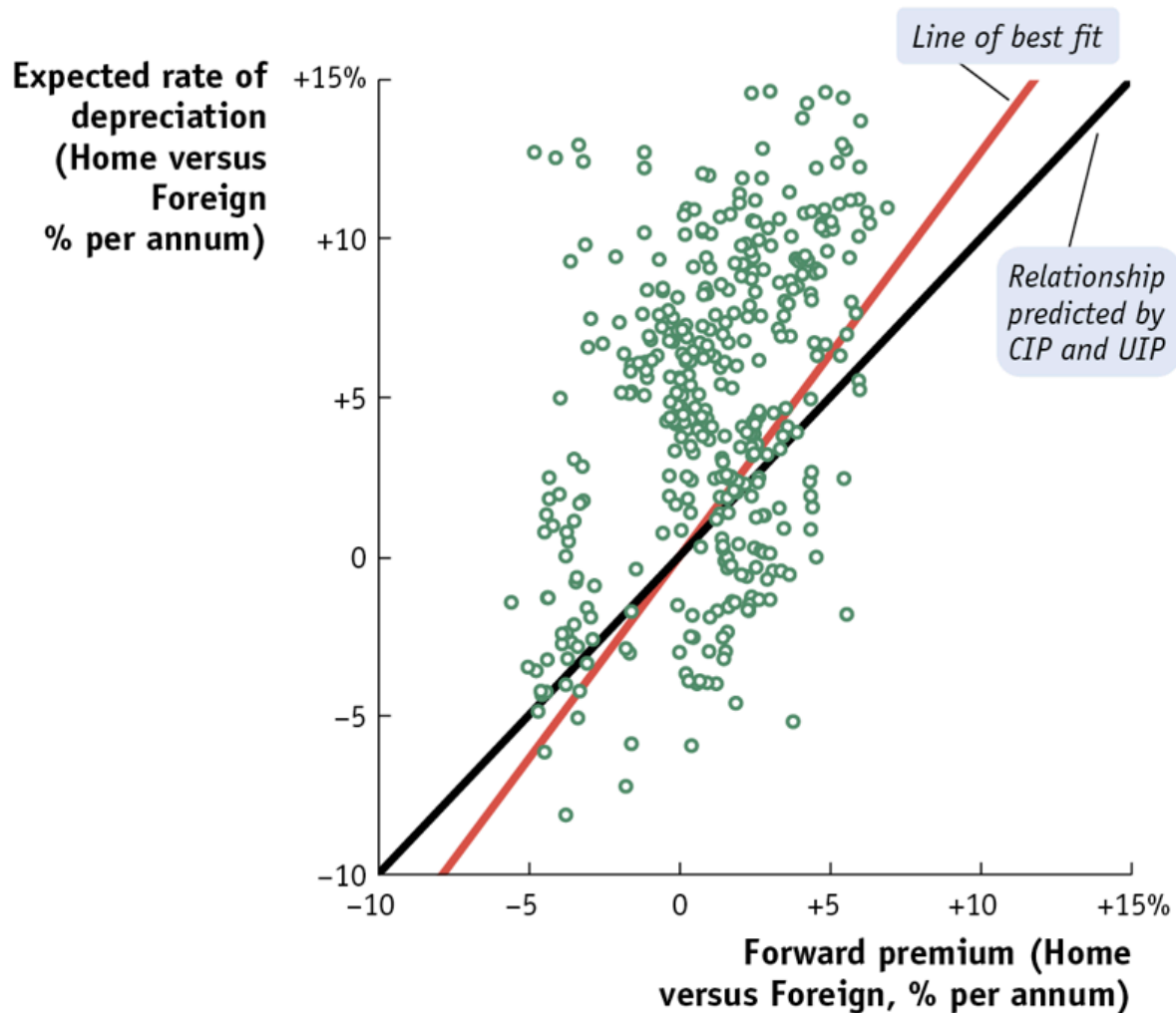
Summary

Recap

- FX market mechanisms in the medium run driven by business cycles

- Short run variation in exchange rate attributed to monetary policy and speculation

- Parity relationships allow us to identify breakeven points at which investment decisions are made

Next Time

- ExR Systems and single currency areas