

Finance 4000

Money and Capital Markets

Eighth class

- Foreign Exchange Markets
  - From last time, Purchasing Power Parity is a long-run relationship satisfied by for foreign exchange rates
    - Countries with flexible exchange rates
    - Relative price levels determine exchange rate
    - Shorter time period than decades?
  - A different relationship based on an arbitrage argument
    - Uncovered interest rate parity
      - Interest rate differentials
      - Cannot make riskless profits based on the obvious

- Covered Interest Parity
  - A real arbitrage argument
    - An arbitrage opportunity is the ability to make a **certain** gain at zero risk
    - The argument
      - If covered interest parity did not hold, there would be an arbitrage opportunity
      - Arbitrage opportunities will be relatively rare and will not persist
      - Hence, covered interest parity will hold

- Compare buying bonds issued by domestic and foreign governments
  - domestic bonds denominated in dollars
  - foreign bonds denominated in pounds sterling
  - Suppose a U.S. resident
    - really care about dollar payment received
  
- Buy U.S. bonds worth \$1000
  - Invest \$1000 at  $t$
  - Interest rate in U.S. is  $i^d$
  - Get  $(1+i^d)\$1000$  at  $t+1$

○ *Buy U.K. bonds*

- Sell dollars today for pounds sterling to buy U.K. government bonds
- Exchange rate is  $E_t \in [f/d]$
- Get  $E_t \$1000$  to buy U.K. bonds today
- Get  $(1+i^f)E_t \$1000$  when mature in pounds sterling
  - Could use *future* exchange market to get dollars
  - To avoid risk, use *forward* exchange market
    - \* Today, can promise to sell pounds sterling at  $t+1$
    - \* Someone else promises to give us dollars
    - \* The exchange rate is the forward exchange rate,  $F_t$
- Get dollars equal to  $(1+i^f)E_t \$1000 F_t^{-1}$  when mature

○ So

- $(1+i^d)\$1000$  at  $t+1$  from buying U.S. bonds with no risk
- $(1+i^f)E_t \$1000 F_t^{-1}$  from buying U.K. bonds with no risk
- If these amounts are not the same, I can get certain profits -- arbitrage profits
- Buy bond with higher income and sell the other short
- If I'm willing to assume that there are no arbitrage profits, then
- $(1+i^d)\$1000=(1+i^f)E_t \$1000 F_t^{-1}$

or

- $$i^d + \frac{F_t - E_t}{E_t} \approx i^f$$

- $\frac{F_t - E_t}{E_t}$  is the proportional appreciation of the domestic money

- Uncovered interest parity

- $$i^d + \frac{E_{t+1}^e - E_t}{E_t} \approx i^f$$

- $\frac{E_{t+1}^e - E_t}{E_t}$  is the expected proportional appreciation of the exchange rate

- $E_{t+1}^e$  is the exchange rate at  $t+1$  expected by people at  $t$

- How important is this?

- Covered interest parity is very consistent with the evidence

- Uncovered interest parity is reasonably consistent with the evidence

- Can use covered interest parity to think about the effects of simple changes on exchange rates
  - Graph with
    - $E_t$  on the vertical axis
    - Interest rates and proportional changes in exchange rates on horizontal axis
  - Effect of increase in foreign interest rate with expected exchange rate and domestic interest rate unchanged
  - Effect of increase in domestic interest rate with expected exchange rate and foreign interest rate unchanged
  - Effect of increase in expected exchange rate with domestic and foreign interest rate unchanged

- Asset markets
  - Money markets
    - Term less than or equal to a year when issued
    - Not really “money”
  - Capital markets
    - Term greater than a year when issued
    - Bonds and stocks
  - Mortgage markets
    - Mortgages and securities backed by mortgages
    - Mortgage is a loan secured by real estate

- Common aspects of asset markets
  - Someone receives funds at issuance in exchange for promised payments or possible payments in the future
  - The value today is the stream of payments discounted to today at some interest rate or discount rate
  - People often buy and sell the securities after issuance
  - Sometimes they are re-packaged
    - Securitized
    - Credit card loans and car loans
  - If promised payments, what happens in the event of default?
    - Collateral
    - Guarantees by third parties

- Is prepayment possible?
  - An option for the issuer
    - hence has value to issuer
  - Corporate bonds
  - Mortgages
- How are the securities priced at issuance?
  - Treasury auction
  - Other similar securities exist
  - IPOs and investment banks
    - [theglobe.com](http://theglobe.com)
- How are the securities traded?
  - Organized exchanges
  - Brokers
  - Dealers
- Regulations on information, trading