

Currency Markets and Foreign Exchange

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International Macroeconomics

- Why study international finance?
 - \$3000 billion daily trade in international currency markets.
 - US current account balance = 6% of national income. How and why?
 - Movements in exchange rate affect domestic economy. For example, currently US assets are cheap for the world.
- Basic concepts :
 - Exchange rate and its movements - appreciation/depreciation
 - Fixed/flexible exchange rate regime - implications for trade and finance
 - Balance of Payments - current account, capital account, trade deficit, fiscal deficit

Readings

- From the textbook: Ch. 12 (omit sec. 3) and Ch. 13

International Comparisons

Consider a pair of headphones.

- Cost in the US= $P_{US}=\$10$
- Cost in China= $P_{CH}=\text{CHY } 50$
- Where to buy from? How to compare?
- Define

Exchange Rate: Cost of foreign currency =Price of one currency in terms of another.

$e_{\$/Y}$ = **Number of \$ needed to buy 1 CNY**

$e_{Y/\$} = \frac{1}{e_{\$/Y}}$ = **Number of CNY needed to buy 1\$.**

If $e_{\$Y} = \0.13 per 1CNY then

- US cost of headphones = \$10 = \$10 * $e_{Y\$}(Y/\$) = \text{CNY } 76.9$
- China cost of headphones = CNY 50 = CNY 50 * $e_{\$Y} = \$ 6.5$

That is, **Price of Good in CNY * $e_{\$Y} = \text{Price of good in } \$$**

Suppose $e_{\$Y} = \0.10 per 1CNY then

- US cost of headphones = \$10 = \$10 * $\frac{1}{0.10} = \text{CNY } 100$
- China cost of headphones = CNY 50 * 0.10 = \$ 5

What happened? When \$ price of Yuan fall.....

- Chinese goods get cheaper for Americans
- US goods get more expensive for Chinese!
- Huge implications for trade.

Definition: Depreciation of dollar (“dollar falls” “dollar down”)

- numerical amount $e_{\$/Y}$ increases
- goods priced in Yuan more expensive in Dollars
- real value of dollar down Imports from China fall, Exports to China rise

Definition: Appreciation of dollar (“dollar rises”, “dollar up”)

- numerical amount $e_{\$/Y}$ decreases
- goods priced in Yuan less expensive in Dollars
- real value of dollar up Imports from China rise, Exports to China fall
- “China under-values its currency” => Numerical value $e_{\$/Y}$ LOW or $e_{Y/\$}$ HIGH. Encourages exports, reduces imports

Who sets e?

- Exchange rate is a price of currency in terms of domestic currency.
- Any price determined by equilibrium of supply and demand
- Who supplies forex? Central Banks of those countries
- Who demands? Governments, banks, firms, you and I.

Why Demand Forex?

- **To pay foreigners!** You buy something on ebay from UK. You have dollars but he wants £. Buy pounds, sell dollars.
- **Arbitrage:** Sleepless wall street trader!

Let S=Singapore\$

- * Market close in US $e_{\$/S} = 0.64$ in the US.
- * Buys \$100 worth of S (=S 156.2)
- * Go to sleep, market starts working in Singapore.
- * Wake up to find $e_{\$/S} = 0.7$ in Singapore!
- * Sell S 155.97 in Singapore to buy dollars
- * Get $S156.2 * e_{\$/S} = 156.2 * 0.7 = \$109.34!$
- * Why sleepless? Because everyone in the US will rush to do this once information gets out. So the difference in the value of the \$ in the US and in Singapore (lower) will disappear.

– Hedging:

- * US importer firm buys from UK supplier worth £1000.
- * Payment due tomorrow.
- * Exchange rate today $e_{\$/\pounds} = 1$.
- * Suppose $e_{\$/\pounds} = 1.2$ tomorrow!
- * So if you wait until tomorrow to convert your dollars to pounds, then you pay \$1200 for imports that cost \$1000 today! So if you expect $e_{\$/\pounds}$ to rise tomorrow then buy \$ today!
- * Remember: Rise in $e_{\$/\pounds}$ implies you pay more for £, \$ loses value.
- * Is the story that simple? Is that all that determines demand for pounds in the US? NO! Because your money earns interest.

Interest Rates & Exchange Rates: Currency as an Asset

Case: You import £1000 worth from UK today. Payment due tomorrow. Today $e_{\$/\pounds} = 1$

- Option 1: Keep your money in \$, earn interest $i^{\$}$. Convert into pounds tomorrow at e^e .
- Option 2: Change money into pounds today at $e_{\$/\pounds}$. Earn interest i^{\pounds} .
- % Difference in earnings between the two assets = $i^{\$} - i^{\pounds}$
- % Expected Gains from holding £ instead of = $\frac{e^e - e_{\$/\pounds}}{e_{\$/\pounds}}$
- Remember! Rise in $e_{\$/\pounds}$ means dollar loses value => Pound gains value => $e^e - e_{\$/\pounds}$ is the reward for holding an asset that became more expensive.
- Simple example: Choice between buying car and buying house. Which asset will probably increase in value tomorrow? How to allocate your money since mortgage rate maybe higher than car loan rate.

Uncovered Interest Rate Parity

- If $i^{\$} - i^{\pounds} > \frac{(e^e - e_{\$/\pounds})}{e_{\$/\pounds}}$ then US interest rate high enough to compensate for increase in value of holding $\pounds \Rightarrow$ Keep money in \$.
- If $i^{\$} - i^{\pounds} < \frac{(e^e - e_{\$/\pounds})}{e_{\$/\pounds}}$ then US interest rate NOT high enough to compensate for increase in value of holding $\pounds \Rightarrow$ Convert to \pounds now!
- If $i^{\$} - i^{\pounds} = \frac{(e^e - e_{\$/\pounds})}{e_{\$/\pounds}}$ then difference in interest rates same as expected gains from holding $\pounds \Rightarrow$ Do nothing \Rightarrow Equilibrium. (Analyze why)

Note: Observe how we define equilibrium as a situation where there is NO incentive to change portfolio of assets.

Example 1: Let $i^{\$}=2\%$, $i^{\pounds}=1\%$, $e_{\$/\pounds} = 1$ and $e^e = \$1.2/\pounds$. Amount of Imports from UK to be paid for= $\pounds 1000$. Question: Is it possible to change portfolio held today to earn profits? Ans: Should choose option 2- Change into \pounds today.

Example 2: Let $i^{\$}=2\%$, $i^{\pounds}=1\%$, $e_{\$/\pounds} = 1$ and $e^e = 1.01$. What to choose now?

Example 3: Let $i^{\$}=3\%$, $i^{\pounds}=1\%$, $e_{\$/\pounds} = 1$ and $e^e = 1.01$. What to choose?

Covered Interest Parity: Similar concept as UIP using Forward Exchange Rate.