Lecture Notes for Chapter 12 of

MACROECONOMICS: An Introduction

The International Economy

06/04/03

In this chapter we will discuss -

- Foreign exchange rates.
- The balance of payments.
- Why exchange rates fluctuate:
  - the impact of inflation
  - *real* exchange rate changes.
- How the twin deficits are linked.
- The benefits of international trade.

What are exchange rates?

- Canada and the U.S. both use “dollars” but they are not the same.
- The cost of one Canadian $ in terms of U.S. $ is the exchange rate.
- Recently: CN$1 = US$0.70.

You are headed to Canada on vacation & your budget is $1,000:

- How many CN$ do you get for US$1,000?
- Rearrange above equation as US$1 = CN$1/0.70 = CN$•1.43
- You get 1.43 CN$ for each US$, or CN$1,430 for your US$1,000!
- Does that mean Canada is cheap?
- Note that exchange rates are two sided!

How is US/Canada exchange rate determined?

- By supply and demand, of course!
- Basic idea:
- Americans want to hold only US $, while Canadians want to hold only CN$.
- Americans buy CN$ to pay Canadians, and Canadians buy US$ to pay Americans.

A foreign exchange dealer buys and sells Canadian dollars.

- Buys CN$ from Canadians for US$ they need to make payments in the US.
- Sells CN$ to Americans who are purchasing things in Canada.
- Keeps an inventory of CN$
- Has a desired level of inventory, like any retailer.

What does dealer do if inventory of CN$ is too high?

- Hold a sale! Cut price of CN$.
- Encourages sale of CN$ to Americans, they find goods in Canada cheaper.
- Discourages sale of CN$ by Canadians, they find U.S. goods expensive.
- Dealer sells more CN$, buys fewer.
- Inventory of CN$ falls to desired level.

If inventory of CN$ is too low,

- Dealer raises the price paid for CN$
- That encourages sale of CN$ to dealer, discourages purchase of CN$ from dealer
- Inventory is restored to desired level.

Equilibrium exchange rate equalizes CN$ sold & bought.

- Equilibrium implies:
- payments to the ROW equal, or “balance”
- payments from the ROW!
- Known as -

The Balance of Payments!

- Key idea:
- Payment to and from the ROW balance because each currency goes home.
- Yen don't stay in Honolulu.
- French francs don't stay in Tokyo.
- Exception:
  Some US dollars stay abroad. Why?

US Balance of Payments

Receipts from ROW		Payments to ROW		Balance
		Current Account		
Merchandise Exports	-	Merchandise Imports	=	Merchandise Trade Balance
Income on U.S. Assets Abroad		Income on For'n Investment		
Services Exports		Services Imports		
Transfers		Transfers		
Exports of Goods and Services	-	Imports of Goods and Services	=	Balance on Current Account
		Capital Account		
Change in For'n Assets in U.S.		Change in U.S. Assets Abroad		
Change in Foreign Official Assets		Change in U.S. Official Assets		
Exports of Capital	-	Imports of Capital	=	Balance on Capital Account
Total Receipts from ROW	-	Total Payments to the ROW	=	Balance of Payments (= 0)

This table tells us that:

- Balance on Current Account
- plus
- Balance on Capital Account
- equals
- Balance of Payments.

But since the Balance of Payments must be zero -

- Balance on Current Account = *negative of* Balance on Capital Account
- Equivalently:
- Net Exports of Goods and Services = *negative of* Net Exports of Capital
- What does our big trade deficit imply?

The U.S. is a net exporter of Capital Assets!

- Trade Deficit is negative Net Exports of G & S so
- Trade Deficit = Net Export of Capital!
- Since international payments must balance, a trade deficit implies a capital account surplus.
- Doesn't surplus sound better than deficit?

U.S. has been trading assets, Treasury bonds, real estate, shares in US firms for Toyotas and crude oil.

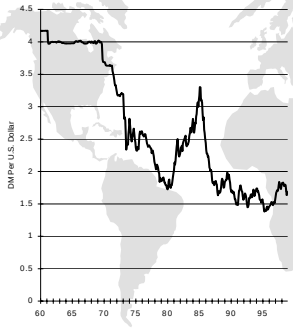
Big Question:

Is this situation bad for the U.S?

Is the trade deficit a loss?

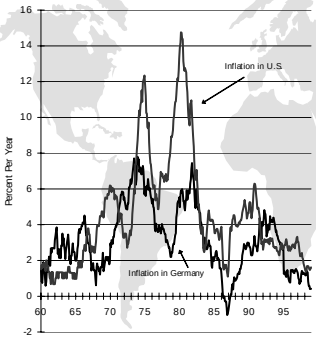
Is the trade surplus a gain?

US-Germany Exchange Rate



- Deutsche Marks/ US$.
- Cost of a dollar in DM.
- Constant before 1969.
- At Bretton Woods 1944 U.S.$ became benchmark currency
- Broke down in 1970s
- Euro replaced DM 1/99

Why did the dollar fall?



- Germany had lower inflation than US.
- purchasing power of US$ fell relative to DM.
- suggests US$ should become less valuable relative to DM.
- it did!

The "Law-of-One-Price"

- A good should sell for same price everywhere.
- A hamburger should have the same price in Chicago as in Hamburg, Germany.
- If the price is higher in Hamburg, firms will ship burgers from Chicago to Hamburg.
- The price in Hamburg will fall and the price in Chicago will rise until they are the same.

But the law of one price is approximate due to:

- Transportation costs,
- Trade barriers, and
- Tariffs

Exploiting a difference in price is called "arbitrage."

- Buy where the price is low.
- Sell where price is high.
- Arbitrage enforces the law of one price.

How well does law-of-one-price hold for -

- US T bonds
- gold
- haircuts
- land
- The Economist magazine
- The Big Mac™

What does law of one price imply about exchange rates?

- Law of One Price says cost of market basket in US, converted to DM, should be same as in Germany.
- If goods costing $250 in US cost DM 1,000 in Germany, then exchange rate should be
- $1 = 4DM (or we say 4DM/$) since
- 4 DM/$ • $250 = DM 1,000, same cost.

Suppose US price level doubles, market basket now costs $500, but Germany has no inflation.

- Law of One Price implies that the dollar must fall to 2DM/$ because that equalizes cost of market baskets:
- 2 DM/$ • $500 = DM 1,000.

When exchange rates adjust to equate costs there is purchasing power parity, or "PPP."

- If PPP holds, differences in inflation rates account for all change in exchange rates.
- Does PPP explain the DM/$ rate?
- To answer this -

Define Real Exchange Rate: (Nominal Exchange Rate) • (CPI^{US}/CPI^{G})

- This is real value of the US$ vs DM.
- Why?
  - If the nominal exchange rate rises, you get more DM per dollar.
  - If CPI^{US} rises, it is cheaper to acquire dollars in the US by labor or sale of G&S or assets.
  - If CPI^{G} falls, the dollar buys more in Germany.

The Real Exchange Rate is constant if PPP holds

- PPP implies any change in CPI^{US}/CPI^{G} is exactly offset by change in nominal exchange rate.
- But we don't expect PPP to be exact, so real exchange rate can vary.

Top two interpretations of the real exchange rate:

1. Relative cost of the market basket in the U.S. vs. Germany.

- Rearrange (DM/$) • ($CPI^{US}/CPI^{G}$) as CPI^{US} / (CPI^{G}/DM/$)
- Cost of Market Basket in US, divided by $ Cost in Germany
- When it is high, will Americans find travel in Germany cheap or expensive?

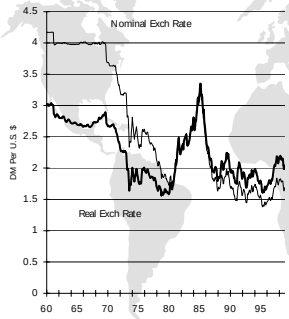
2. Ratio of purchasing power of $ spent in Germany vs. spent in U.S.

- Rearrange (DM/$) • ($CPI^{US}/CPI^{G}$) as [(DM/$)/CPI^{G}] / [1/CPI^{US}]
- Purchasing Power of $1 in Germany divided by Purchasing Power of $1 in US.
- When it is high, dollar is “strong.”

Real exchange rate is relative rather than absolute.

Always equal to the nominal exchange rate in CPI base period.

DMs/$: Nominal & Real



- Implies PPP not exact.
- Why? Many items in CPI basket not traded.
- But, the *real* rate has moved much less than the *nominal* DM/$.
- So inflation does explain some variation in DM/$ rate, specially 1970s.

Conclusion: inflation accounts for much, but not all, of "decline of the dollar"

- Decline in the real value of the US$ also reflects Germany's recovery from WWII.
- But why was US$ so strong in early 1980's?

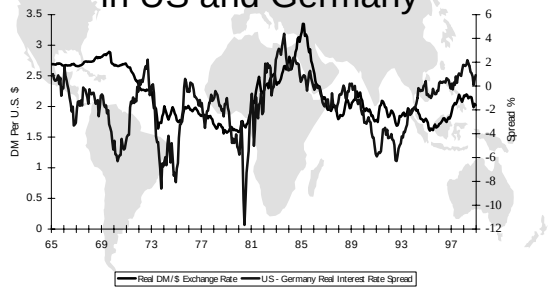
Why did real DM/$ rate soar in the early 1980's?

- *Not* because of differences in inflation, since the real exchange rate already reflects that.
- *Not* because of demand for US exports, since that was when our trade deficit widened.
- Perhaps the dollar was in demand by investors wanting to buy US assets.
- Why?

How Real Exchange Rates Link the Twin Deficits:

- Federal deficit pushed US real interest rate up.
- Foreign investors bought US$ to buy T bonds.
- Strong demand for US$ drove up its value, in nominal and real terms.
- Strong $ made US exports costly, imports cheap.
- Large trade deficit was the result.
- ROW savings then balanced Federal deficit, S=I.
- All the pieces fit together!

Real DM/$ reflects spread between real interest rates in US and Germany



When a currency is weak, central bank may boost interest rates to "defend" it.

- European countries in 1992.
- Mexico in 1994.
- Russia in 1998!
- And recession follows. Why?
- Is it worth the cost of a recession to "defend" your exchange rate?

Germany raised interest rates in 1992

- Response to inflation after reunification
- But Monetary Union fixed exchange rates, so all obliged to follow Germany's policy.
- Sweden raised one-day interest rate to 500%!
- Britain and France gave up, to avoid recession.
- European Monetary Union left in shambles.

Lesson of 1992:

- Fixed exchange rates mean loss of monetary policy
- Only alternative is capital controls.
- A country cannot have together:
  - free movement of capital
  - fixed exchange rates
  - independent monetary policy
- Called "unholy trinity" of monetary policy.

Europe now has a single currency, the Euro.

- What are the advantages?
- The disadvantages?
- Monetary Union seems on track:
  - countries have met fiscal goals (deficit reduction)
  - But Britain and others have chosen not to join.

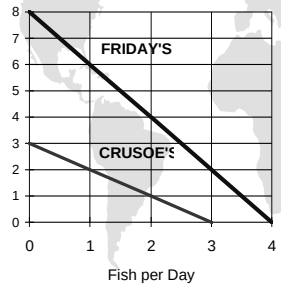
International Trade

- Highly controversial
- NAFTA, WTO hot political topics.
- Why do countries trade?
- Why don't you make your own shoes?
- Because there is a gain from trade.

The principle of "Comparative Advantage":

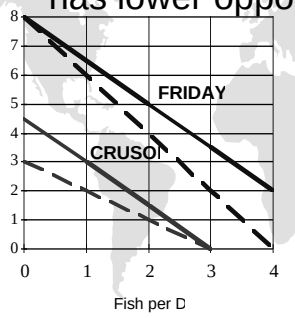
- A good should be produced where the opportunity cost is the lowest.
- Each country should do what it is relatively good at.
- True of individuals too!
- What is your comparative advantage?

Friday has an "absolute advantage" over Crusoe



- Should Crusoe do the fishing or gather coconuts?
- He is lousy at both!
- If they don't trade, their consumption is limited to what they each produce.

If each specializes where he has lower opportunity cost -



- Producing 1 fish costs Friday 2 coconuts,
- producing 1 fish costs Crusoe only 1 coconut.
- Crusoe's comparative advantage is in fishing,
- By specializing and trading, both achieve a higher standard of living.

Dates from David Ricardo 1817!

- So why don't people like free trade?
- Clinton campaigned against NAFTA then backed it when President.
- Latest GATT agreement was barely ratified.
- Agreements to make trade freer are always controversial, elicit strong opposition.
- Why?

Is there a downside to lowering trade barriers?

- Some workers lose job, seniority.
- Firms with specialized capital also lose.
- Losses easy to see: layoffs, closures.
- Gains harder to see:
  - new hires at Microsoft due to exports.
- Not easy to see connections between wider range of goods at lower cost and free trade.


The End!
Good luck on the final!