LECTURE NOTES

Chapter 14: Exchange Rates and International Monetary System

1. The U.S. Balance of Payments Accounts

- Balance of payment accounts: records economic transactions between the U.S. and foreign residents in both goods and assets
    - Credits: all earnings from the foreign activities of U.S. residents and the U.S. government
    - Debits: Expenditures abroad are reported as debits
    - Each credit has to be matched by a credit (and vice versa) –*the balance always balances*
- Subcategories:
    - (1) The Current Account
        - Merchandise exports (+) and imports (-)
        - Service transactions (net)
        - Transfers (net)
    - (2) The Financial Account
        - Private capital inflows (+)
        - Private capital outflows (-)
    - (3) Statistical Discrepancy
        - Errors and omissions: It has been growing in recent years
    - (4) Official Reserve Transactions
        - Increase in official U.S. official reserves assets
        - Increase in foreign official assets in the U.S.

TABLE 14-1 U.S. Balance of Payments, 2010 (billions of dollars)

	Credit (+)	*Debit (−)*	*Balance (−) Deficit (+)Surplus*
Current account			
Merchandise exports (+) and imports (−)	1,288.7	−1,934.6	−645.9
Service transactions (net)	311.1		
Transfers (net)		−136.1	
Current account balance			−470.9
Financial Account			
Private capital inflows (+) and outflows (−)[a]	909.7	−1,003.3	
Financial account subbalance			−93.6
Statistical discrepancy			216.5
Official reserve transactions			
Increase in U.S. official reserve assets(−)			−1.8
Increase in foreign official assets in the United States			349.8
Total official reserve transactions			348.0

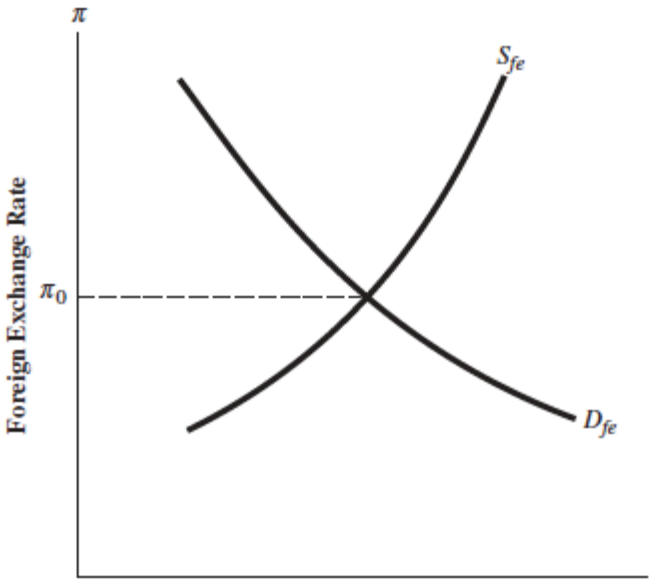
[a]Includes increases in U.S. government foreign assets other than official reserve assets.

SOURCE: *Survey of Current Business, September 2011*. Data are on a slightly different basis (coverage and timing) from U.S. census data shown elsewhere in the book.

2. Exchange Rates and the Market for Foreign Exchange

- The foreign exchange market: Market at which national currencies are exchanged for one another
- Assume that national currencies are only used domestically
    - Then before each international exchange takes place, importers need to sell USD in the foreign exchange market to the national currency of the exporter
    - This is usually done by a financial intermediary (bank, broker, etc.)
    - Total U.S. residents expenditures abroad represents
        - A demand for foreign currencies
        - The supply of USD in the foreign exchange market
    - Total U.S. residents foreign earning represents
        - A demand for USD
        - The supply of foreign exchange
- Demand and Supply in the Foreign Exchange Market
    - The nominal exchange rate is defined in the foreign exchange market
    - Nominal exchange rates are usually expressed in terms of how many units of a foreign currency are necessary to buy one USD, $e_{EUR} = \frac{2USD}{1EUR} \rightarrow e_{EUR} = 0.50$
    - Be careful:
        - If the nominal exchange rate rises, the USD has depreciated (and the EUR appreciated)
        - If the nominal exchange rate falls, the USD has appreciated (and the EUR depreciated)
    - Demand for foreign exchange is downward sloping
        - A rise in the exchange rate makes the EUR more expensive (in terms of USD) and therefore imports (from the U.S.) decrease
        - A fall in the exchange rate makes the EUR less expensive (in terms of USD) and therefore imports (from the U.S.) increase
        - No defined relationship for assets
            - An increase in the nominal exchange rate does not affect the return of a financial asset
            - Downward sloping demand in the foreign exchange market depends on the effect of the exchange rate on imports and exports of goods and services
    - Supply of foreign exchange is upward sloping
        - An increase in the exchange rate makes U.S. imports by the rest of the world cheaper
        - However, less EUR are received *per* USD exported
        - Therefore, for supply to be upward sloping, the foreign demand for U.S. exports must be more than unit elastic

FIGURE 14-1 Foreign Exchange Market

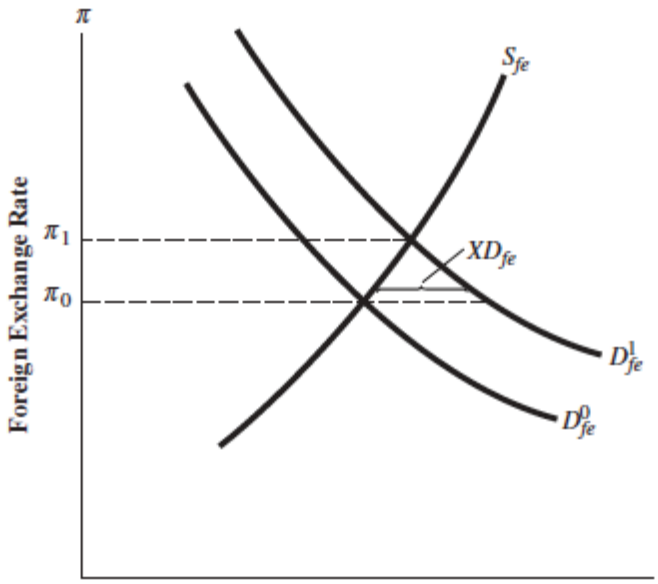


Supply of and Demand for Foreign Exchange

The demand schedule for foreign exchange is downward sloping because the demand for foreign exchange to finance imports falls as the exchange rate rises, making foreign goods more expensive. The supply schedule for foreign exchange is upward sloping, reflecting the assumption that the foreign exchange proceeds from export sales rise as the exchange rate rises, making domestic goods less expensive to foreign buyers. The equilibrium exchange rate is π_0, the rate that equates demand and supply.

- Exchange Rate Determination: Flexible Exchange Rates
    - Flexible exchange rate system or floating rate system: No central bank intervention
    - Assume imports increase
        - Then demand for foreign exchange (i.e. EUR) increases (shifts to the right)
        - As the nominal exchange rate increases, quantity imported decreases
    - In a flexible exchange rate system the nominal exchange rate is defined purely by the market
        - Assume there is no central bank

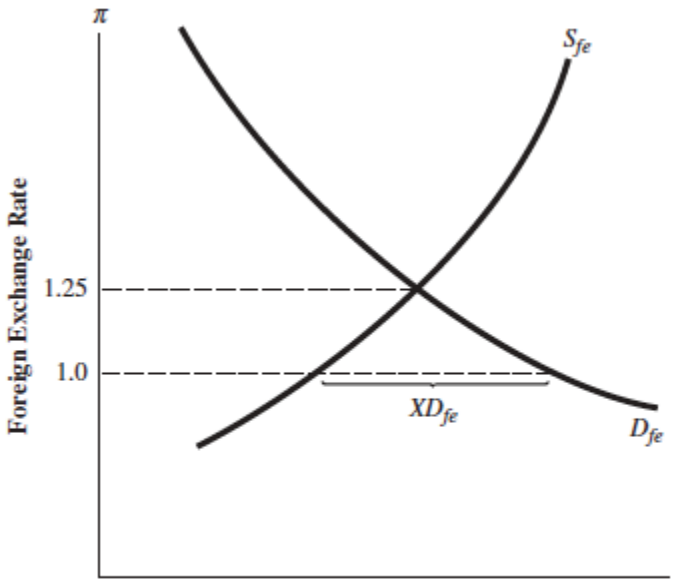
FIGURE 14-2 Effect in the Foreign Exchange Market of an Increase in the Demand for Imports



An autonomous increase in import demand shifts the demand schedule for foreign exchange from D_{fe}^{0} to D_{fe}^{1}. At the initial equilibrium exchange rate, there is an excess demand for foreign exchange (XD_{fe}). The exchange rate rises to π_1 to reequilibrate supply and demand in the foreign exchange market.

- Exchange Rate Determination: Fixed Exchange Rates
    - The monetary authority intervenes as demand or supply in the foreign exchange market in order to keep the exchange rate fixed, either because there is a law with that mandate or because that's what the central bank considers the appropriate policy
    - Fixed Exchange Rate example: Bretton Woods
        - The U.S. would maintain a convertibility of the USD to gold
        - Other countries would fix (peg) their currencies to the USD [fix exchange rate]
        - The IMF was founded to administer the Bretton Woods system
    - Pegging (fix) the exchange rate
        - Assume the nominal exchange rate is below (above) the equilibrium level. Then the USD is overvalued (undervalued) and the EUR is undervalued (overvalued)
        - If the exchange rate is below (above) the equilibrium level, then the U.S. central bank has to sell EUR (USD) and buy USD (EUR) until the exchange rate returns to the equilibrium level
        - Alternatively, the European Central Bank can be the one selling EUR (USD) and buying USD (EUR) until the exchange rate returns to the equilibrium level
        - Note: The exchange rate <u>does not depend</u> on only one big player
        - Note: Central banks cannot sell unlimited amounts of foreign exchange currencies. Central banks have a limit of how much the can appreciate their currency <u>with this policy</u>
- Implications of intervention
    - If the U.S. central bank sells EUR, then there is a reduction in the U.S. official reserves assets
    - If the European central bank supplies the EUR, then there is an increase in the European official reserves assets
    - In the U.S. balance of payments, the sum of (1) the reduction in the U.S. official reserves assets and (3) the increase in the European official reserves assets equals the U.S. balance of payments *deficit*
        - Deficit: The difference between spending abroad and earnings from abroad
        - For the exchange rate to be maintained at its level, the deficit has to be supplied by the central bank
        - A fix exchange rate is not sustainable with persistent deficit in the balance of payments (unless the EUR is supplied by other central banks)

FIGURE 14-3 Foreign Exchange Market with a Fixed Exchange Rate



In a fixed exchange rate system, if the official exchange rate ($\pi = 1.0$) is below the market equilibrium rate ($\pi = 1.25$), there will be an excess demand for foreign exchange, XD_{fe}. To keep the exchange rate from rising, domestic or foreign central banks must supply foreign exchange.

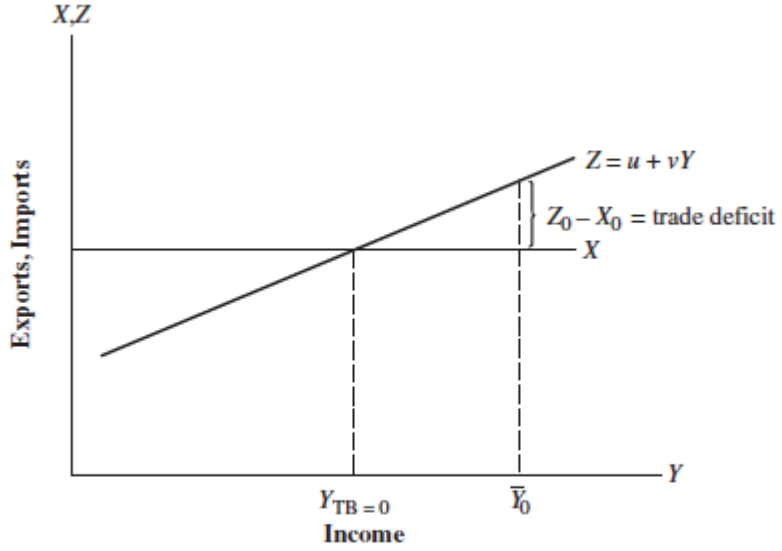
3. The Current Exchange Rate System

- After the abandonment of the Bretton Woods system in 1971, the world is best described by a "managed float" system
    - Why Bretton Woods was abandoned?
        - The U.S. accumulated deficits
        - The gold claims (convertible USD) in other central banks were more than the gold reserves in the U.S.
        - The USD was overvalued. The U.S. "closed the gold window" and devalued its currency
        - Since then there is no more gold exchange standard, but fiat currencies
- A managed (or dirty) float is *in between* a fixed and floating exchange rate
    - The nominal exchange rate does not depend only on the market
    - The central bank intervenes but not to the extent to keep the exchange rate fixed
    - Some systems:
        - Managed float (discretionary)
        - Fixed with bands
        - Crawling peg
        - Crawling peg with fixed bands
        - Etc…
- Other regimes:
    - Orthodox currency board
        - Domestic currency is convertible to another currency at a fix parity
        - Reservess are between 90% and 110% of base money
        - $\frac{\Delta BM}{\Delta Reserves} = 100\%$ [reserve *pass-through*]
    - Heterodox currency board
        - Domestic currency is convertible to another currency at a fix parity
        - Reserve requirement is not observed
        - Reserves pass-through is not observed
        - Note: Argentina(case study on this matter) had an heterodox currency board, not an orthodox one
    - Dollarization
        - A country uses some other currency
        - It may or may not be the USD ("dollarization" is a general term)
        - Cases: Panamá, Ecuador

4. Advantages of Alternative Exchange Rate Regimes

- How much to manage (float)?
- Advantages of Exchange Rate Flexibility
    - Deal with balance of payments surpluses of deficits
    - Insulate the economy from foreign monetary shocks (more on this below)
- Trade Balance and the Level of Economic Activity
    - *Ceteris Paribus*, more income implies more imports
    - At a fixed exchange rate, the equilibrium level of income can result in trade deficit
        - The nominal exchange rate, or the price level, needs to adjust (see real exchange rate section below)

FIGURE 14-4 Trade Balance (TB) and the Level of Economic Activity



The level of income that equates imports (Z) with the exogenous level of exports (X) is $Y_{TB=0}$. There is no reason that the equilibrium level of income is equal to $Y_{TB=0}$. For example, if $\overline{Y}_0$ is the equilibrium level of income, imports will exceed exports, and there will be a deficit in the trade balance ($Z_0 - X_0$)

- Capital Flows and the Level of Economic Activity
    - Capital flows depend on expected rate of returns
    - Assume an expansionary monetary policy with fix exchange rate
        - Interest rates are lowered
        - The financial account will see its net value decrease
            - Less investment in the U.S.
            - More investment outside the U.S.
        - Balance of trade also worsens
    - Assume an expansionary fiscal policy with fix exchange rate
        - Increase in income drives an increase in money demand
        - Interest rates increase
        - The financial account will see its net value increase
        - But balance of trade worsens
- Exchange Rate Flexibility and Insulation from Foreign Shocks
    - Assume an external negative shock (i.e. a crisis)
    - Exports to the rest of the world decline
    - With flexible exchange rate, the USD depreciates
    - This eliminates the trade deficit and stimulates exports (and reduces imports) minimizing the effect of the external shock on domestic GDP
- Arguments for Fixed Exchange Rates
    - Exchange rate volatility ads risk to exporters and importers. Some risk can be *hedged* (future markets), but this still has a price
    - Exchange rate movements shift resources across tradable and non-tradable sectors (structural unemployment)
    - Exchange rate flexibility is open to “speculative attacks”
- However, there is a general rule:
        - If external shock is monetary: then fix the exchange rate to avoid a change in the relative price of tradable to non-tradable goods
        - If external shock is real: then let the exchange rate to float so that, if necessary, relative price of tradable to non-tradable goods adjust to new structural conditions

5. Exchange Rates in the Floating Rate Period

- Easy… read yourself

6. Global Trade Imbalances

- During the Bretton Woods era there were global trade imbalances
- During the managed exchange rates with fiat currencies, there is also global trade imbalances
- Implications of some identities
    - Disregarding errors, trade balances worldwide. Surplus of some nations equals the deficit of other nations. If CU = Current Account, CA = Capital Account, and ORT = Official Reserves Transactions, then:
        - $CU + CA + ORT \equiv 0$
    - Also:
        - $C + S + T \equiv Y = C + I + G + X - Z$
        - $(T - G) + (S - I) \equiv (X - Z)$
        - Government and private savings equals the trade balance

7. More on Exchange Rates

- Real Exchange Rate (RER)
    - The purchasing power of one currency with respect to the purchasing power of another currency
    - $RER = e_{i,j} * \left(\frac{P_j}{P_i}\right) \rightarrow RER = \frac{nEUR}{1USD} \cdot \left(\frac{P_{USD}}{P_{EUR}}\right)$
    - In equilibrium it is indifferent to buy the same basket of goods domestically or internationally
    - Assume good x costs 100USD in the U.S. or 200EUR in Europe and that $e = \frac{2EUR}{1USD}$
    - Then it is the same to buy good x in Europe or in the U.S.
    - Assume now the EUR is depreciated and the exchange rate is now $e = \frac{3EUR}{1USD}$
    - Then there arbitrage opportunities because it is cheaper to buy good *x* in the U.S.
        - If flexible exchange rate
            - When the U.S. buys more EUR to buy good *x* and sell it back in the U.S. the exchange rate falls again to$e = \frac{2EUR}{1USD}$
        - If fixed exchange rate
            - When the U.S. buys more EUR to buy good *x* and sell it back in the U.S. the price of good *x* in EUR rises (and/or the price of good *x* in USD falls) until $e = \frac{2EUR}{1USD} \cdot \left(\frac{100USD}{200EUR}\right) = \frac{3EUR}{1USD} \cdot \left(\frac{100USD}{300EUR}\right)$
        - If exchange rate is managed
            - Then the final result is "in between" the two above cases
            - $e = \frac{2EUR}{1USD} \cdot \left(\frac{100USD}{200EUR}\right) = \frac{2.5EUR}{1USD} \cdot \left(\frac{100USD}{250EUR}\right)$
- Interest Rate Parity
    - It should be the same to invest in a financial asset in any currency
    - $(1 + i_{USD}) = \frac{E(e_{t+k})}{e_t}(1 + i_{EUR}) \rightarrow expected\ devaluation: \frac{E(e_{t+k})}{e_t} = \left(\frac{1+i_{USD}}{1+i_{EUR}}\right)$
- Optimal Currency Areas
    - Area which efficiency is maximized when there is only one currency
    - Political borders may not define the optimal currency area
    - A successful currency union:
        - Labor mobility
        - Capital mobility
        - Fiscal coordination
        - Share the business cycle
    - What if the Fed targets domestic variables but (1) the optimal currency area is different than the U.S. political borders and (2) produces negative effects on the rest of the world?