

# Open Economy

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# Introduction

The Balance of Payments

Brief History of the International Monetary System

The Foreign Exchange Market

A Simple Theory of Exchange Rate Determination

Saving, Investment, and the International Sector

# The Balance of Payments

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# The Current Account

$$CA = NX + \text{Net Income on Inv.} + \text{Net Transfers}$$

- Records current flows of funds into and out of the country. (+ if received by US – if paid by US)
  1. Exports and imports of goods & services.
  2. Income received by US residents from investments in other countries. Income paid on investments in the US owned by residents of other countries.
  3. The difference between transfers made to residents of other countries and transfers received by US residents from other countries.

# The Financial Account

$$\text{Fin. Account} = \text{Capital Inflow} - \text{Capital Outflow}$$

- Records purchases of assets a country made abroad and foreign purchases of assets in the country.
  1. There is a **Capital Outflow** from the US when an investor in the US buys an asset in another country.
  2. There is a **Capital Inflow** into the US when a foreign investor buys a local asset.
- Net Foreign Investment (NFI) is the difference between capital outflow and inflow. So  $\text{NFI} = -\text{Fin. Account}$ .

# The Capital Account

- Records relatively minor transactions, such as migrants' transfers, and sales of patents, trademarks, rights to natural resources.
- Prior to 1999 the term capital account enclosed also the transactions nowadays included in the financial account.

# The Balance of Payments

$$BP = \text{Curr. Account} + \text{Fin. Account} + \text{Cap. Account} = 0$$

- The Balance of Payments always equals 0:
  - Suppose the US has a current account deficit. It spent more on goods & services than it received.
  - What do foreigners do with that extra US currency?
    1. They kept the currency or invested it somewhere else. Foreign holdings of dollars.
    2. They invested it in the US. Foreign investment.
  - In both cases these are capital inflows, these show up positive in the financial account.

# Example

<b>Balance on current account</b>	<b>-928,002</b>
Balance on goods and services	-774,205
Balance on primary income	52,643
Balance on secondary income	-206,441
<b>Balance on capital account</b>	<b>-6,985</b>
<b>Balance on financial account</b>	<b>1,073,031</b>

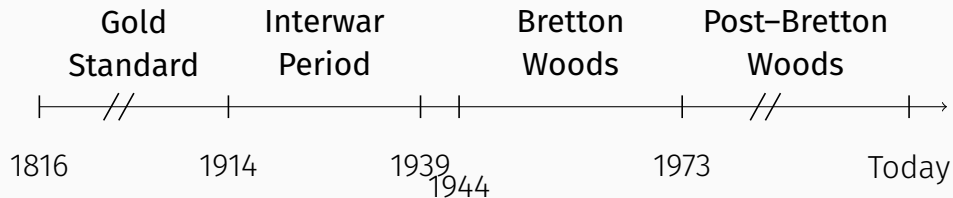
- US Balance of Payments in 2023. See [BEA release](#).
- Statistical Discrepancy.
- See [IMF's Manual](#).



# Brief History of the International Monetary System

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# International Monetary System



# David Hume's Price-Specie Flow Model - Assumptions

- Developed in the eighteenth century.
- Helps us think about the gold standard.

## Assumptions:

- Only gold coin circulates. The role of banks is negligible.
- Each time merchandise is exported, the exporter receives payment in gold and he takes to the mint to have coined.
- Quantity theory of money.

# David Hume's Price-Specie Flow Model - Results

Consider that your country has a trade deficit. Then:

- It experiences gold outflow. With less gold internally prices fall.
- With more gold abroad, prices increase.
- The specie flow produced a change in relative prices.
- Imported goods are more expensive, exported goods cheaper. The trade imbalance gets eliminated.

# In Hume's Words



David Hume

*Suppose four-fifths of all the money in Great Britain to be annihilated in one night, and the nation reduced to the same condition, with regard to specie, as in the reigns of the Harrys and Edwards, what would be the consequence? Must not the price of all labour and commodities sink in proportion, and every thing be sold as cheap as they were in those ages? What nation could then dispute with us in any foreign market, or pretend to navigate or to sell manufactures at the same price, which to us would afford sufficient profit? In how little time, therefore, must this bring back the money which we had lost, and raise us to the level of all the neighbouring nations? Where, after we have arrived, we immediately lose the advantage of the cheapness of labour and commodities; and the farther flowing in of money is stopped by our fulness and repletion.<sup>a</sup>*

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<sup>a</sup>From Hume's *Political Discourses*.

# Comments

- General equilibrium model. Describes the balance of payments adjustment mechanism at the time (mid eighteenth century).
- Add two ingredients to help understand the gold standard of late nineteenth century:
  1. International capital flows. How does interest rate explain them?
  2. Absence of large scale international gold shipments.

# Cunliffe Committee's Version of the Model

- Paper rather than gold coin circulates.
- Central bank stands ready to convert currency into gold.
- If Britain runs a trade deficit against France, it pays with pounds.
- French merchants have no use for them. They present the paper bills to the Bank of England for conversion into gold. Money supply falls in Britain. And money supply increases in France.
- Nothing changed from the price-specie version.

# Cunliffe Committee's Version of the Model II

- But this version still predicts a lot of gold transactions. Why don't these happen?
- When a country runs a payments deficits and begins losing gold, it can speed up the adjustment of money supply.
  - By reducing the money supply, the central bank puts a downward pressure on prices, enhances the competitiveness of domestic goods, and eliminates the external deficit.
  - How? Discount rate or open market operations.



# The Foreign Exchange Market

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# The Nominal Exchange Rate

**Nominal Exchange Rate:** The value of one country's currency in terms of another country's currency.

- How many units of foreign currency can you purchase with \$1? The nominal exchange rate.
- Ex: Nominal exchange rate between US dollar and ARG peso is 1500 ARS/USD.
- Or: 0.00067 USD/ARS.

# Demand of Dollars

Demand curve for dollars in exchange for pesos:

- Argentine firms and hhs want to buy US goods & services.
- Argentine firms and hhs want to invest in the US.
- Traders.

Shifts in the demand (to the right):

- Expansion in foreign country.
- Interest rate rises in the US.
- Speculators think the value will increase in the future.

# Supply of Dollars

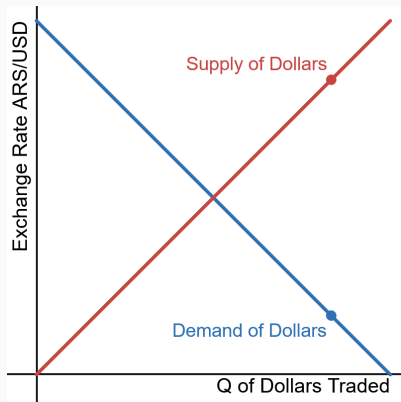
Who supply dollars (in exchange for pesos)?

- US firms and hhs that want Argentine goods & services.
- US firms and hhs that want to invest in Argentina.
- Traders

What shifts supply?

- Similar factors.
- The supply of dollars (in exchange for pesos) is the same as the demand of pesos (in exchange for dollars).

# Equilibrium Exchange Rate



- Equilibrium exchange rate ARS/USD.
- Currency appreciation/depreciation: An increase (decrease) in the market value of one currency relative to another currency.

# The Real Exchange Rate

$$\text{Real Exchange Rate} = \text{Nom. Exchange Rate} \cdot \frac{P_{\text{Domestic}}}{P_{\text{Foreign}}}$$

**Real Exchange Rate:** The price of domestic goods in terms of foreign goods.

- No currency involved.
- How many units of foreign goods I can buy with one domestic good.
- Recall Big Mac index.

# How Movements in the Exchange Rate Affect NX

$$\text{Real Exchange Rate} = \text{Nom. Exchange Rate} \cdot \frac{P_{\text{Domestic}}}{P_{\text{Foreign}}}$$

- A real depreciation of the dom. currency increases NX.
  - Local goods are relatively cheaper for foreign consumers. And foreign goods are relatively more expensive for local consumers.
- A real appreciation of the dom. currency decreases NX.
  - ...
- How do real appreciations (depreciations) happen?

# Exchange Rate Regimes

- Floating. The nominal exchange rate is determined by demand and supply.
- Fixed. The nominal exchange rate is kept fixed for long periods.
- Managed float. Occasional government intervention so that the exchange rate doesn't fluctuate wildly.
- Countries also can:
  - Peg its currency to that of another country (Argentina in 90s).
  - Use another country's currency (Ecuador).
  - Decide to adopt a single currency (euro).



# A Simple Theory of Exchange Rate Determination

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# The Law of One Price

**The Law of One Price:** In the absence of trade frictions (such as transport costs and tariffs), and under conditions of free competition and price flexibility, identical goods sold at different locations should be sold for the same prices when prices are expressed in a common currency.

- Consequence of arbitrage.
- Strong prediction on the exchange rate.

# Purchasing Power Parity - Example

- Suppose that a Hershey candy bar costs \$2 in the US and £4 in the UK.
- If currencies have the same purchasing parity, then the exchange rate should be 2 £ per \$.
  - What if 1 £ per \$.
  - Or 3 £ per \$.
- Once the exchange rate reflects the purchasing power of the two currencies, there are no further opportunities for profit.

# Purchasing Power Parity - Theory

## Assumptions:

- All products can be traded internationally.
- Products and consumer preferences are the same in all countries.
- There are no barriers to trade.

## Consequence:

- Real exchange rate equals 1.
- Nominal exchange rate equals the ratio of prices.

# Purchasing Power Parity - Comments

- Best understood as a long run theory. In the long run exchange rates move to equalize the purchasing power of different currencies.
- Strong assumptions, but main idea holds. People take advantage of any feasible arbitrage opportunity.
- Currencies can't be systematically overvalued or undervalued.

# Saving, Investment, and the International Sector

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# Net Exports Equal Net Foreign Investment

$$NX = NFI$$

- When  $M > X$  net exports are negative and there will be a net capital inflow as hhs in the US sell assets and borrow to pay for the imports.
- When net exports are positive, there will be a net capital outflow as hhs in the US accumulate foreign assets.

# National Savings

$$S = S_{\text{Private}} + S_{\text{Public}} = Y - C - G$$

Where:

- $S_{\text{Private}} = Y - C - T$
- $S_{\text{Public}} = T - G$
- National savings as the sum of private and public savings.



# Saving and Investment Equation

$$S = I + NFI$$

- Start with  $Y = C + I + G + NX$
- Use the definition of national savings
- Use the identity  $NX = NFI$
- National savings are either invested domestically or overseas.

# The Effect of a Government Budget Deficit

$$S = I + NFI$$

- Gov't sells bonds to increase spending.
- They increase interest to attract investors:
- Domestically: this discourages investment.
  - A higher interest rate means some investment projects are no longer profitable.
- Internationally: this discourages NX.
  - US dollar appreciates as a result of higher demand.
  - Exports become more expensive to the rest of the world.
- This mechanism crucially depends on the FOREX regime.