PRICE AND INCOME EFFECTS OF DEVALUATION/APPRECIATION

THE PRICE EFFECT

**Analyzing the case of a devaluation of £, or an appreciation of US$.

With our last example (see ECON103L9F12), we saw that the UK initially benefits with the devaluation of the £: the UK exports more (UK goods became cheaper) and imports less (US goods became more expensive). However, the UK still imports some goods from the US: either food or goods that are used as inputs in the UK production. If those inputs are more expensive, costs of production (and prices) in the UK increase, that is, inflation happens in the UK.

On the other hand, deflation in the US might occur due to lower production costs (since imports of British inputs are cheaper). *As a result, inflation in the UK partially counterbalances the advantage that the UK has got with the devaluation of the exchange rate.* With inflation in the UK, British goods become more expensive for US consumers, so UK exports decrease. On the other hand, US goods are cheaper due to the deflation in US, causing UK imports to increase.

Upper Left: Since British firms use some US goods as inputs in the production, and US goods are more expensive after the $ appreciation, then costs of UK goods increase. Thus, supply of UK goods decreases (i.e., the supply of US imports decreases): the supply curve shifts up from S' to S''.

Upper Right: Since some of American firms are using UK inputs, it costs them less to produce after the £ devaluation. This means that the supply curve of US goods (and the supply of US exports) shifts down from S to S' (i.e., the supply increases).

Lower Left: Since it is more expensive to produce in the UK, the supply of UK goods (and the supply of UK exports) shifts up from S to S' (i.e., the supply decreases).

Lower Right: After the £ devaluation, it is cheaper to produce in the US because UK inputs used in the production are cheaper. Thus, supply of US goods (i.e., the supply of UK imports) increases: the supply curve shifts down from S' to S''.
THE INCOME EFFECT

**Analyzing the case of a devaluation of £, or an appreciation of US$.

Digression: Note that as there is MPC and MPS, there also exists MPM (Marginal Propensity to Import = by how much imports change when income changes by $1). The National income = Aggregate expenditure equilibrium equation \( Y = C + I + G + X - M \) can be written as:

\[
Y = (C_0 + MPC*Y) + I + G + X - (M_0+MPM*Y),
\]

where \( C_0 \) = autonomous consumption and \( M_0 \) = autonomous imports.

At first, from the UK side, devaluation of £ induces the UK’s \( Y \) to increase, because they will export more and import less. However, from this increase in \( Y \), part will be spent on more imports (that is, as income increases in the UK, their imports from US also increases), counterbalancing the initial decrease in imports.

The opposite will happen in the US. Since it is cheaper to buy abroad after $ appreciation, Americans buy more goods from the UK, and less from their own production. The result is then that there is a decrease in production of US goods, that is, decreased US income. Thus, with less income, Americans will spend less on UK imports (their demand for UK goods decreases).
Upper Left: Appreciation of $ implies that X decreases, while M increases in the US => Y decreases. With lowered income, Americans demand less imports from the UK (from D to D').

Upper Right: Income increases in the UK, increasing the demand for goods from the US (from D' to D'', i.e., they will demand more US exports).

Lower Left: Demand for UK goods decreases (from D' to D'') because income of Americans decreased (i.e., Americans want less UK exports).

Lower Right: Since income increased in the UK, they demand more goods from the US (from D to D').

EXCHANGE RATE REGIMES

First, some definitions:

Internal equilibrium – full employment with price stability (low inflation)

External equilibrium – balance of payments equilibrium (i.e., no need for loans to equilibrate the balance of payments)

Foreign reserves – foreign currency held by some country’s central bank

Speculation – an opportunity to profit on future market developments (for example, buy dollar cheap now to sell it at a higher price after devaluation

I. FLEXIBLE (FLOATING) EXCHANGE RATES

Exchange rate (or price of foreign currency) is determined by the market (demand and supply of the currency). This is the exchange rate regime we have been using. Therefore, the effects we’ve analyzed are under this regime. To recap, read below.

Primary Effect - Suppose we are under a free exchange rate system and we have trade balance (exports = imports).

What happens if the currency depreciates/appreciates?

• When a country's currency appreciates, the national currency becomes more expensive in the international market, therefore national products becomes more expensive to foreign consumers, so exports go down, while foreign products become relatively cheaper, so imports go up. If the changes are sufficiently big, this creates a trade deficit

• Depreciation: go through a similar analysis as above for this case

Secondary Effects

Price Effect – what happens to internal prices?

• Appreciation: Imported products become cheaper, therefore it is less costly to import inputs and capital goods, which decreases production costs, allowing a decrease in internal prices. National products become cheaper, increasing exports, which may reduce the trade deficit created by the appreciation of the national currency.

• Depreciation: go through a similar analysis as above for this case

Income Effect – what happens to income?

• Appreciation: it becomes cheaper to import and harder to export, that is M goes up and X goes down in the equation Y=C+I+G+(X-M). This implies that GDP goes down (national income goes down). Now the population has lower income, thus the country will demand less imports (see technical note below). This reduces the trade deficit created by the appreciation of the national currency.

• Depreciation: go through a similar analysis as above for this case
II. FIXED EXCHANGE RATE I – GOLD STANDARD

The government guarantees to trade (buy or sell) the national currency for gold at a FIXED rate.

- In the gold standard, devaluation/appreciation of currency is impossible – if devaluation happens, everybody starts using gold
- Sacrifices internal equilibrium to achieve external equilibrium
- Adjustments do not happen through exchange rates but through internal economic activity (i.e., changes in prices and/or GDP)

For example, suppose a country with a trade surplus:
Gold inflow $\rightarrow$ gold is exchanged for money $\rightarrow$ money supply increases $\rightarrow$
- Inflation occurs (because $MV=PQ$): national goods become less competitive $\rightarrow$ exports decrease and imports increase $\rightarrow$ trade surplus decreases
- Interest rates decrease $\rightarrow$ investment increases $\rightarrow$ GDP increases (income increases) $\rightarrow$ imports increase $\Rightarrow$ trade surplus decreases

Suppose now a country with a trade deficit:
Gold outflow $\rightarrow$ money is exchanged for gold $\rightarrow$ money supply decreases $\rightarrow$
- Price declines (because $MV=PQ$) $\rightarrow$ national goods become more competitive $\rightarrow$ exports increase and imports decrease $\rightarrow$ trade deficit decreases
- Interest rates increase $\rightarrow$ investment decreases $\rightarrow$ GDP decreases $\rightarrow$ income decreases imports decrease $\Rightarrow$ trade deficit decreases

III. FIXED EXCHANGE RATE II – PEGGED EXCHANGE RATE SYSTEM

(See ch17)

Pegged exchange rate – the rate is legally determined (only the government can change it)

- Markets have no influence on such exchange rate

![Diagram of exchange rate](image-url)
In the graph:

Pegged exchange rate = 0.25
B = quantity demanded of dollars ($)
A = quantity supplied of dollars

What can be done to bring the market to an equilibrium (when demand increased to D')?
1. Use foreign reserves previously accumulated (i.e., increase the supply of $ so that the equilibrium is at £0.25/$)
2. Pull D' back to D.
   a) Issue import permits (this may generate corruption)
   b) Auction permits (this is a de facto devaluation because demanders will have to pay a higher price to get dollars)
3. Devalue currency and re-peg at the equilibrium exchange rate (i.e., at £0.40/$); to avoid speculation, the central bank will strongly deny the possibility of devaluation

HISTORICAL PERSPECTIVE (very brief summary, only to help recap)

COMPETITIVE DEVALUATION IN THE 1930s

The Gold Standard broke down during the 30s as countries engaged in competitive devaluations. The GS worked fairly well from 1870 until the WW1. During the war government financed military expenses by printing money, however, this inevitably led to inflation; and, by the end of the war, price levels were very high everywhere. In an effort to encourage exports and domestic employment, countries started to frequently devalue their currencies. As a result, people lost faith in the system and started to demand gold. This then put a lot of pressure on the countries’ reserves, which forced the countries to suspend the exchange of the currency into gold. Thus, by the end of 20s the GS was failing in most countries.

BRETTON WOODS SYSTEM

The BW system established rules, institutions, and procedures that were set to regulate the international monetary system. The International Monetary Fund (IMF) and the International Bank Reconstruction and Development (IBRD) were institutions established by the leaders at BW. Key to the BW system was the obligation for every participating country to adopt a monetary policy that would keep the exchange rate of its currency fixed to the U.S. dollar; and, the ability of the IMF to alleviate temporary imbalances of payments. With respect to the first feature, of fixed exchange rate, essentially what occurred was the U.S. dollar replacing the role gold had played. However, the dollar was backed by gold. The BW system came to an end in 1971 when the US unilaterally terminated convertibility of the US$ to gold. This made the US$ a fiat currency.

IMF – was to be the keeper of the rules established in BW and the main instrument of public international management. The organization follows macroeconomic policies of its members, in particular those policies with an impact on exchange rates and on the balance of payments. Its main objective is to stabilize international exchange rates and facilitate development.

World Bank – is an international financial institution that provides leveraged loans to poorer countries for capital programs. The basic goal is to reduce poverty.
GENERAL AGREEMENT ON TARIFFS AND TRADE

The main objective was the reduction of barriers to international trade. This was achieved through the reduction of tariff barriers, quantitative restrictions and subsidies on trade through a series of agreements. The GATT was replaced by the World Trade Organization (WTO) in 1995.

THE PLAZA AGREEMENT OF 1985

The objective of this agreement was to depreciate the US dollar in relation to the Japanese Yen and German Deutshce Mark by intervening in the currency markets. The reason for the depreciation was to reduce the US current account deficit which had reached 3.5% of the GDP and to help the US economy emerge from a deep recession. By devaluing the dollar, US exports rose. The agreement was successful in reducing trade deficit with Europe; however, it did not alleviate the trade deficit with Japan. US goods were more competitive but were unable to succeed in the Japanese market.