



# Money, Banking, and Financial Institutions

## Chapter 6 : Foreign Exchange Rates

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1. Exchange Rates and Exchange Rate Regimes
2. Real Exchange Rate and Competitiveness
3. Short-Term Exchange Rates
4. Long-Term Exchange Rates

## Learning Objectives

1. Understand the concept of exchange rates and how they are determined in the foreign exchange market.
2. Explain the different types of exchange rate regimes, including floating, fixed, and pegged regimes.
3. Analyze the advantages and disadvantages of various exchange rate regimes for different economies.
4. Understand how exchange rate fluctuations affect the competitiveness of a country's goods and services in the global market.

## **Exchange Rates and Exchange Rate Regimes**

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## Exchange Rates (1/3)

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- ▶ There are two possible quotations when discussing exchange rates, which can be a source of confusion.
  - ▷ **Direct Quotation** provides the amount of foreign currency required to buy ONE unit of the domestic currency.
    - Example:  $e = 0.75$  USD for 1 CAD.
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  - ▷ **Indirect Quotation** provides the amount of domestic currency required to buy ONE unit of foreign currency.
    - Example: 1.33 CAD for 1 USD.
    - An "increase" indicates that the domestic currency is depreciating.

- ▶ Since 1973, most countries have currencies that fluctuate freely against each other.
- ▶ When a country's currency fluctuates freely, the country has a "floating" or "flexible" exchange rate regime.

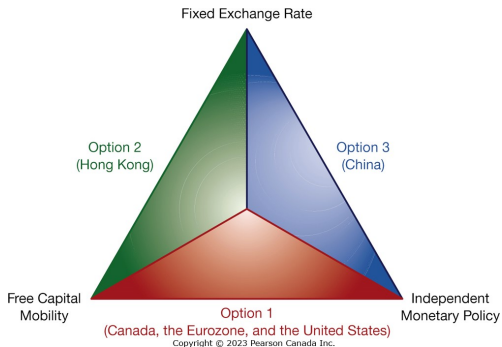


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- ▶ When a country's currency fluctuates freely, the country has a "floating" or "flexible" exchange rate regime.
- ▶ Some countries have fixed exchange rate regimes: they aim for a specific value for their currency relative to a reference currency, against which they set the value of their currency.
  - China during certain periods (CNY pegged to USD);
  - Saudi Arabia (SAR pegged to USD).

**Figure 1:** Historical Exchange Rate of Canadian Dollar to US Dollar



**Figure 2:** The Mundell-Fleming Incompatibility Triangle



► According to Mundell-Flemming, it is impossible for a country to achieve all three objectives of **free capital mobility**, **independent monetary policy**, and **fixed exchange rate regimes** simultaneously.

## **Real Exchange Rate and Competitiveness**

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## Comparing Prices, Not Currencies (1/2)

Since the beginning of this topic, we have discussed the nominal exchange rate (or market exchange rate).

- ▶ What determines a country's competitiveness in international markets (and thus  $X$  and  $M$ ) is not really the amount of foreign currency that foreigners need to pay to buy our currency.
- ▶ What really matters is the **price of domestic products** relative to the **price of foreign products**, expressed in the **same currency** (to allow comparisons).

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## Comparing Prices, Not Currencies (2/2)

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  - Suppose 1 CAD is worth 0.75 USD ( $e = 0.75$ )
  - 2000 CAD equals  $e \times 2000 = 0.75 \times 2000 = 1500$  USD
- ▶ The price of aluminum is the same in both countries when expressed in the same currency!

## Real Exchange Rate

A country's competitiveness depends on the **real exchange rate** rather than the nominal exchange rate.

- ▶ To calculate the real exchange rate, express the price of Canadian products in foreign currency,  $eP$ .
  - The price of Canadian products  $P$  is in CAD.
  - $eP$  is the price of Canadian products expressed in foreign currency.
- ▶ The price of foreign products  $P^*$  is in foreign currency.
- ▶ Thus, the **real exchange rate**,  $E = \frac{eP}{P^*}$ , is the price of domestic goods divided by the price of foreign goods, all expressed in comparable units.

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- ▶ Thus, the **real exchange rate**,  $E = \frac{eP}{P^*}$ , is the price of domestic goods divided by the price of foreign goods, all expressed in comparable units.
  - If  $E > 1$ , then  $eP > P^*$ : the good in Canada is **MORE** expensive than abroad.
  - If  $E < 1$ , then  $eP < P^*$ : the good in Canada is **LESS** expensive than abroad.
  - If  $E = 1$ , then  $eP = P^*$ : the price of the good is the **same** in both countries.

## Effects of Exchange Rate

- ▶ An appreciation of the domestic currency makes domestic goods and services less competitive in global markets in the short and medium term.
  - Indeed, at given prices ( $P/P^*$ ), an appreciation of the domestic currency leads to a real appreciation:  $\uparrow e \implies \uparrow E$
  - An **appreciation** of the domestic currency generally causes a slowdown in exports and an increase in **imports** due to a decrease in the foreign prices.
  
- ▶ A **depreciation** of the domestic currency generally causes an acceleration in activity in the **export** sector and an increase in the price of imports, tending to raise **inflation**.

## Short-Term Exchange Rates

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## Determinants of Exchange Rates

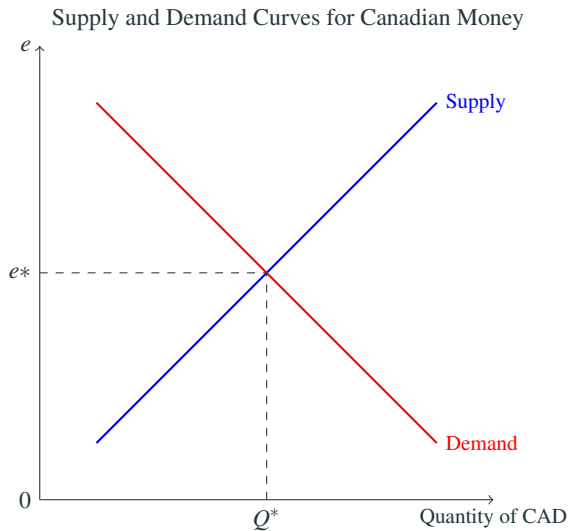
- ▶ In the short term, the real exchange rate (and the competitiveness of the domestic economy) depends on the nominal exchange rate.
- ▶ Therefore, we need to understand the determinants of the nominal exchange rate.
  - In the short term, the nominal exchange rate is determined by supply and demand in the foreign exchange market.
  - We will examine some determinants of supply and demand for currencies.
  - We will focus on the simplest determinants.

## Demand and Supply of Currencies (1/2)

- ▶ The demand for currencies comes from various participants in the foreign exchange market.
  - If foreign households want to buy Canadian **goods** (exported by Canada), they need CAD.
  - If foreign households want to hold Canadian **assets**, they need CAD.
  
- ▶ The demand for one currency generates supply for another currency.
  - Thus, the supply of currencies comes from individuals or institutions wanting to make purchases in one currency but holding their money in another currency.
  - If Canadian residents want to buy foreign goods, they offer CAD to purchase foreign currencies and pay for their imports.



## Demand and Supply of CAD (1/3)

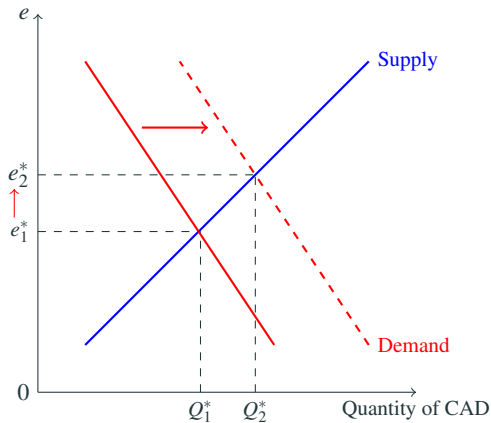


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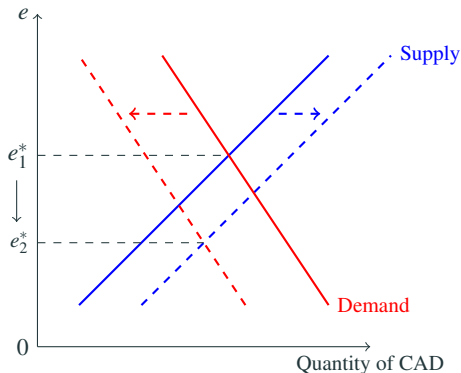
- ▶ Canadian goods become highly sought after in global markets.
  - Demand shifts to the right.
  - Appreciation of CAD (increase in  $e$ ).



- ▶ The credit rating of the Canadian government is downgraded by rating agencies.

## Effects of Shocks on $e$ (2/3)

- ▶ The credit rating of the Canadian government is downgraded by rating agencies.
  - Foreigners want fewer Canadian assets: demand shifts to the left.
  - Canadians want to hold more foreign assets: supply shifts to the right.



## Effects of Shocks on $e$ (3/3)

- ▶ The Bank of Canada lowers its key interest rate while the Fed keeps its rate unchanged.
- ▶ Decrease in  $i$  (interest rate in Canada) and  $i^*$  (Fed rate unchanged).
  - Thus,  $i - i^*$  decreases.
  - Bank deposits in Canada become less attractive than before.
  - Foreigners want fewer Canadian assets: the demand curve shifts left.
  - Operators with funds in Canada liquidate their assets and sell their CAD: the supply curve shifts right.
  - Resulting in a decrease in  $e$ : depreciation of the CAD.

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  - Resulting in a decrease in  $e$ : depreciation of the CAD.
- ▶ The ultimate determinant of the short-term nominal exchange rate is **the interest rate differential** with foreign countries:  $i - i^*$ .
- ▶ Since prices are sticky in the short term, fluctuations in  $e$  are fully reflected in  $E$ , and thus in the relative prices of goods and services between economies.

## **Long-Term Exchange Rates**

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# The Law of One Price

- ▶ According to **the law of one price**, the price of the same good is the same everywhere when expressed in the same currency.
  - If this were not the case, one could buy the good where it is cheaper and resell it where it is more expensive.
  - Such arbitrage operations would increase the price in the cheaper country and decrease it in the more expensive country.

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  - Such arbitrage operations would increase the price in the cheaper country and decrease it in the more expensive country.
- ▶ Applying the law of one price to all goods implies that the real exchange rate  $E = 1$ , which gives  $e = P^*/P$ .
  - Thus, in the long term, the nominal exchange rate should simply reflect the price differential.
  - If the relation  $e = P^*/P$  holds, we are in the framework of **absolute purchasing power parity (PPP)**.

The theory of PPP also exists in a weaker form: relative PPP.

► Taking  $E = \frac{eP}{P^*}$ , we know that:  $g_E \approx g_e + g_P - g_{P^*}$ , i.e.:

$$g_E \approx g_e + \pi - \pi^* \quad (1)$$

- The real price of domestic goods and services evolves according to three factors:  $e$ , domestic inflation  $\pi$ , and inflation in the rest of the world  $\pi^*$ .
- We will use this relation to derive the equation for relative PPP.

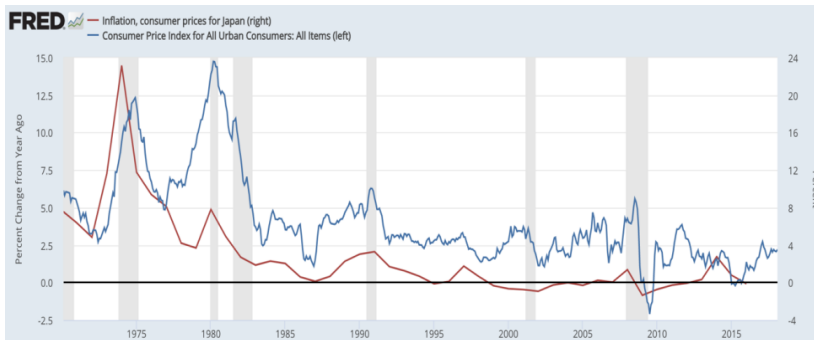
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  - We will use this relation to derive the equation for relative PPP.
- To obtain the **relative PPP** relation, we assume  $g_E = 0$ , which gives:
- $$g_e = \pi^* - \pi.$$
- In the long term, the variation in the nominal exchange rate should simply reflect the **inflation differential**.
  - If the domestic economy has a higher inflation rate than the other economy, the domestic currency will tend to depreciate in the long term.

**Figure 3:** Higher inflation in the US than in Japan since 1975



Source : World Bank

**Figure 4:** Depreciation of the US dollar relative to the Japanese Yen over time



## Key Takeaways

- ▶ Nominal exchange rates refer to the value of a currency against another currency, while real exchange rates adjust for inflation and reflect a country's competitiveness.
- ▶ The choice of exchange rate regime (fixed, floating, or pegged) influences a country's economic policy flexibility.
- ▶ The Mundell-Fleming Triangle illustrates the trade-offs between a fixed exchange rate, free capital mobility, and independent monetary policy.
- ▶ It is impossible to achieve all three policy objectives at once: countries must prioritize two and forgo one.