Fixed Exchange Rates and Foreign Exchange Intervention

International Finance

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Introduction

Introduction

- In reality, the assumption of complete exchange rate flexibility is rarely accurate.
- Industrialized countries operate under a hybrid system of **managed floating exchange rates.** A system in which governments attempt to moderate exchange rate movements without keeping exchange rates rigidly fixed.
- A number of developing countries have retained some form of government exchange rate fixing.
- How do central banks intervene in the foreign exchange market?

Why Study Fixed Exchange Rates?

Why Study Fixed Exchange Rates?

- Four reasons to study fixed exchange rates:
  1. Managed floating
  2. Regional currency arrangements
  3. Developing countries and countries in transition
  4. Lessons of the past for the future

Central Bank Intervention and the Money Supply

The Central Bank Balance Sheet and the Money Supply

- Central bank balance sheet:
  - It records the assets held by the central bank and its liabilities.
  - It is organized according to the principles of double-entry bookkeeping.
  - Any acquisition of an asset by the central bank results in a + change on the assets side of the balance sheet.
  - Any increase in the bank's liabilities results in a + change on the balance sheet's liabilities side.

Central Bank Intervention and the Money Supply

- The assets side of a balance sheet lists two types of assets:
  - Foreign assets: Mainly foreign currency bonds owned by the central bank (its official international reserves).
  - Domestic assets: Central bank holdings of claims to future payments by its own citizens and domestic institutions.
- The liabilities side of a balance sheet lists as liabilities:
  - Deposits of private banks
  - Currency in circulation
- Total assets = total liabilities + net worth
- Net worth is constant.
  - The changes in central bank assets cause equal changes in central bank liabilities.
- Any central bank purchase of assets automatically results in an increase in the domestic money supply.
- Any central bank sale of assets automatically causes the money supply to decline.

Foreign Exchange Intervention and the Money Supply

- The central bank balance sheet shows how foreign exchange intervention affects the money supply because the central bank's liabilities are the base of the domestic money supply process.
- The central bank can negate the money supply effect of intervention though sterilization.

Sterilization

- Sterilized foreign exchange intervention: Central banks sometimes carry out equal foreign and domestic asset transactions in opposite directions to nullify the impact of their foreign exchange operations on the domestic money supply.
- With no sterilization, there is a link between the balance of payments and national money supplies that depends on how central banks share the burden of financing payments gaps.

Central Bank Intervention and the Money Supply

Figure 1: Effects of a $100 Foreign Exchange Intervention: Summary

Domestic Central Bank's Action	Effect on Domestic Money Supply	Effect on Central Bank Domestic Assets	Effect on Central Bank Foreign Assets
Nonsterilized foreign exchange purchase	+$100	0	+$100
Sterilized foreign exchange purchase	0	−$100	+$100
Nonsterilized foreign exchange sale	−$100	0	−$100
Sterilized foreign exchange sale	0	+$100	−$100

How the Central Bank Fixes the Exchange Rate

Foreign Exchange Market Equilibrium Under a Fixed Exchange Rate

- The foreign exchange market is in equilibrium when:

$$R = R^* + (E^e - E)/E \tag{1}$$

  - When the central bank fixes E at E^0, the expected rate of domestic currency depreciation is zero.
  - The interest parity condition implies that E^0 is today's equilibrium exchange rate only if: $R = R^*$.

Money Market Equilibrium Under a Fixed Exchange Rate

- To hold the domestic interest rate at R^*, the central bank's foreign exchange intervention must adjust the money supply so that:

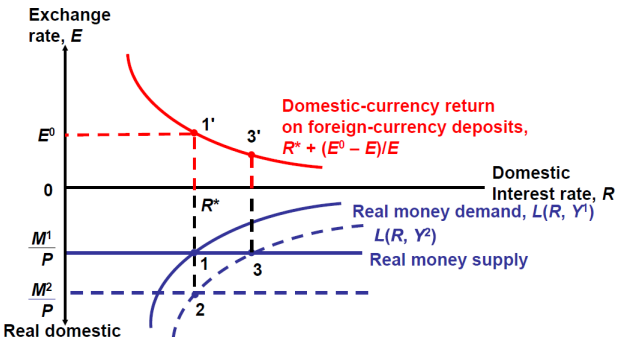
$$M^S/P = L(R^*, Y) \tag{2}$$

- Example: Suppose the central bank has been fixing E at E^0 and that asset markets are in equilibrium. An increase in output would raise the money demand and thus lead to a higher interest rate and an appreciation of the home currency.
- The central bank must intervene in the foreign exchange market by buying foreign assets in order to prevent this appreciation.
- If the central bank does not purchase foreign assets when output increases but instead holds the money stock constant, it cannot keep the exchange rate fixed at E^0.

A Diagrammatic Analysis

- To hold the exchange rate fixed at E^0 when output rises, the central bank must purchase foreign assets and thereby raise the money supply.

Figure 2: Asset Market Equilibrium with a Fixed Exchange Rate, E^0

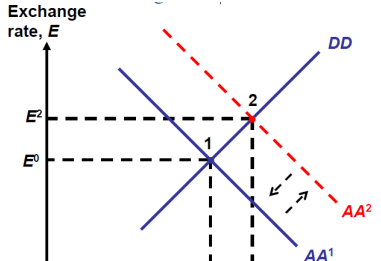


Stabilization Policies with a Fixed Exchange Rate

Monetary Policy

- Under a fixed exchange rate, central bank monetary policy tools are powerless to affect the economy's money supply or its output.
- Figure shows the economy's short-run equilibrium as point 1 when the central bank fixes the exchange rate at the level E^0.

Figure 3: Monetary Expansion Is Ineffective Under a Fixed Exchange Rate

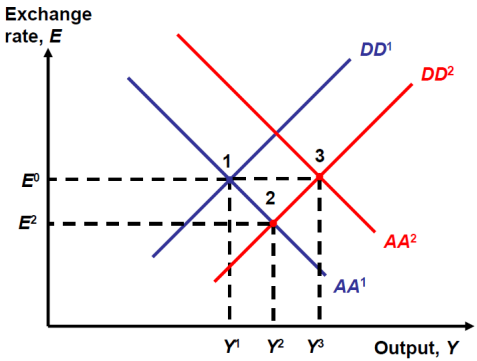


Fiscal Policy

- How does the central bank intervention hold the exchange rate fixed after the fiscal expansion?
- The rise in output due to expansionary fiscal policy raises money demand.
- To prevent an increase in the home interest rate and an appreciation of the currency, the central bank must buy foreign assets with money (i.e., increasing the money supply).
- The effects of expansionary fiscal policy when the economy's initial equilibrium is at point 1 are illustrated in next Figure .

Fiscal Policy

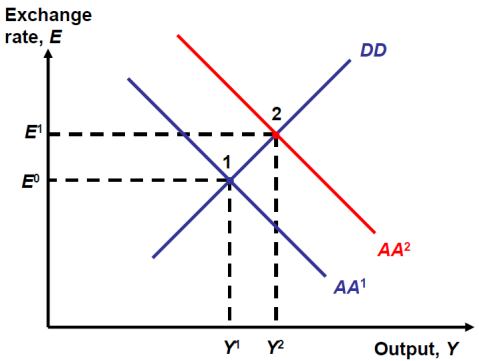
Figure 4: Fiscal Expansion Under a Fixed Exchange Rate



Changes in the Exchange Rate

- **Devaluation**: It occurs when the central bank raises the domestic currency price of foreign currency, E. It causes a rise in output, a rise in official reserves and an expansion of the money supply.
- It is chosen by governments to: Fight domestic unemployment, improve the current account and affect the central bank's foreign reserves.
- **Revaluation**: It occurs when the central bank lowers E. In order to devalue or revalue, the central bank has to announce its willingness to trade domestic against foreign currency, in unlimited amounts, at the new exchange rate.

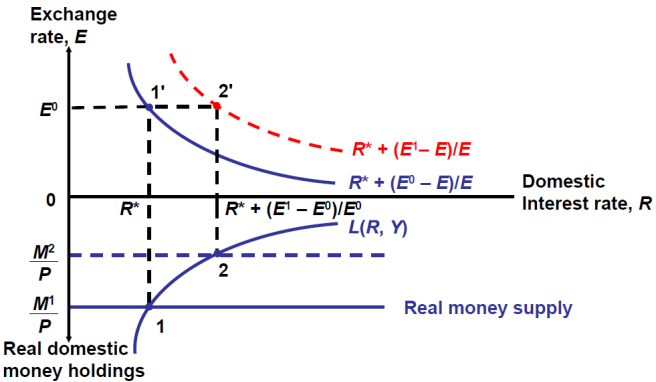
Figure 5: Effects of a Currency Devaluation



Balance of Payments Crises and Capital Flight

Balance of payments crisis: It is a sharp change in official foreign reserves sparked by a change in expectations about the future exchange rate.

Figure 6: Capital Flight, the Money Supply, and the Interest Rate



- The expectation of a future devaluation causes: A balance of payments crisis marked by a sharp fall in reserves and a rise in the home interest rate above the world interest rate.
- An expected revaluation causes the opposite effects of an expected devaluation.

Capital flight

- The reserve loss accompanying a devaluation scare.
- The associated debit in the balance of payments accounts is a private capital outflow.

Self-fulfilling currency crises

- It occurs when an economy is vulnerable to speculation.
- The government may be responsible for such crises by creating or tolerating domestic economic weaknesses that invite speculators to attack the currency.

Managed Floating and Sterilized Intervention

Managed Floating and Sterilized Intervention

- Under managed floating, monetary policy is influenced by exchange rate change.
- Perfect Asset Substitutability and the Ineffectiveness of Sterilized Intervention: When a central bank carries out a sterilized foreign exchange intervention, its transactions leave the domestic money supply unchanged.

Perfect asset substitutability

- The foreign exchange market is in equilibrium only when the expected return on domestic and foreign currency bonds are the same.
- Central banks cannot control the money supply and the exchange rate through sterilized foreign exchange intervention.

Imperfect asset substitutability

- Assets' expected returns can differ in equilibrium.
- Risk is the main factor that may lead to imperfect asset substitutability in foreign exchange markets.
- Central banks may be able to control both the money supply and the exchange rate through sterilized foreign exchange intervention.

Foreign Exchange Market Equilibrium Under Imperfect Asset Substitutability

- When domestic and foreign currency bonds are perfect substitutes, the foreign exchange market is in equilibrium only if the interest parity condition holds:

$$R = R^* + (E^e - E)/E \tag{3}$$

- This condition does not hold when domestic and foreign currency bonds are imperfects substitutes.

Managed Floating and Sterilized Intervention

- Equilibrium in the foreign exchange market requires that:

$$R = R^* + (E^e - E)/E + \rho \tag{4}$$

- Where: ρ is a **risk premium** that reflects the difference between the riskiness of domestic and foreign bonds.
- The risk premium depends positively on the stock of domestic government debt:

$$\rho = \rho(B - A) \tag{5}$$

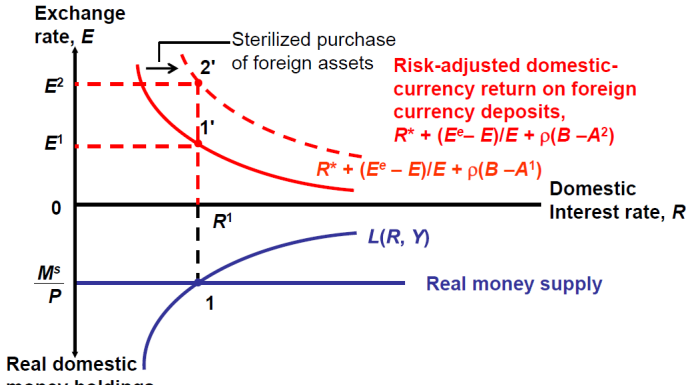
- Where:
- B is the stock of domestic government debt.
- A is domestic assets of the central bank.

The Effects of Sterilized Intervention with Imperfect Asset Substitutability

- A sterilized purchase of foreign assets leaves the money supply unchanged but raises the risk adjusted return that domestic currency deposits must offer in equilibrium.
- The figure illustrates the effects of a sterilized purchase of foreign assets by the central bank. The purchase of foreign assets is matched by a sale of domestic assets (from A^1 to A^2).

The Effects of Sterilized Intervention with Imperfect Asset Substitutability

Figure 7: Effect of a Sterilized Central Bank Purchase of Foreign Assets Under Imperfect Asset Substitutability



Evidence on the Effects of Sterilized Intervention

- Empirical evidence provides little support for the idea that sterilized intervention has a significant direct effect on exchange rates.

The Signaling Effect of Intervention

- Signaling effect of foreign exchange intervention: An important complicating factor in econometric efforts to study the effects of sterilization
- Sterilized intervention may give an indication of where the central bank expects (or desires) the exchange rate to move.
- This signal can change market views of future policies even when domestic and foreign bonds are perfect substitutes.

Summary

Summary

- There is a direct link between central bank intervention in the foreign exchange market and the domestic money supply.
- When a country's central bank purchases (sells) foreign assets, the country's money supply automatically increases (decreases).
- The central bank balance sheet shows how foreign exchange intervention affects the money supply.
- The central bank can negate the money supply effect of intervention through sterilization.
- A central bank can fix the exchange rate of its currency against foreign currency if it trades unlimited amounts of domestic money against foreign assets at that rate.

Summary

- A commitment to fix the exchange rate forces the central bank to sacrifice its ability to use monetary policy for stabilization.
- Fiscal policy has a more powerful effect on output under fixed exchange rates than under floating rates.
- Balance of payments crises occur when market participants expect the central bank to change the exchange rate from its current level.
- Self-fulfilling currency crises can occur when an economy is vulnerable to speculation.
- A system of managed floating allows the central bank to retain some ability to control the domestic money supply.