Lecture 9
Open Economy Macroeconomics

Principles of Macroeconomics
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A FIRST THEORY OF EXCHANGE-RATE DETERMINATION: PURCHASING-POWER PARITY

- The *purchasing-power parity* theory is the simplest and most widely accepted theory explaining the variation of currency exchange rates.
Implications of Purchasing-Power Parity

• If the purchasing power of the dollar is always the same at home and abroad, then the exchange rate cannot change.

• The nominal exchange rate between the currencies of two countries must reflect the different price levels in those countries.
Implications of Purchasing-Power Parity

• When the central bank prints large quantities of money, the money loses value both in terms of the goods and services it can buy and in terms of the amount of other currencies it can buy.
Figure 3 Money, Prices, and the Nominal Exchange Rate During the German Hyperinflation

Indexes
(Jan. 1921 = 100)

Money supply

Price level

Exchange rate

1921 1922 1923 1924 1925
Limitations of Purchasing-Power Parity

• Many goods are not easily traded or shipped from one country to another.
• Tradable goods are not always perfect substitutes when they are produced in different countries.
Nominal and PPP exchange rates (CHF/EUR)

Quellen: BFS, SNB, KOF
A Macroeconomics Theory of the Open Economy

Open Economies

An open economy is one that interacts freely with other economies around the world.
A Macroeconomics Theory of the Open Economy

- Key Macroeconomic Variables in an Open Economy
  - The important macroeconomic variables of an open economy include:
    - net exports
    - net foreign investment
    - nominal exchange rates
    - real exchange rates
A Macroeconomics Theory of the Open Economy

• Basic Assumptions of a Macroeconomic Model of an Open Economy
  • The model takes the economy’s GDP as given.
  • The model takes the economy’s price level as given.
SUPPLY AND DEMAND FOR LOANABLE FUNDS AND FOR FOREIGN-CURRENCY EXCHANGE

• The Market for Loanable Funds

\[ S = I + NCO \]

• At the equilibrium interest rate, the amount that people want to save exactly balances the desired quantities of investment and net capital outflows.
The Market for Loanable Funds

- The supply of loanable funds comes from national saving ($S$).
- The demand for loanable funds comes from domestic investment ($I$) and net capital outflows ($NCO$).
The Market for Loanable Funds

- The supply and demand for loanable funds depend on the real interest rate.
- A higher real interest rate encourages people to save, i.e. increase the supply of loanable funds.
- A higher real interest rate discourages firms to invest in new buildings, machines & equipment.
- A higher real interest rate discourages people to buy assets abroad.
- The interest rate adjusts to bring the supply and demand for loanable funds into balance.
Figure 1 The Market for Loanable Funds

- **Equilibrium Quantity**: The point where the supply and demand curves intersect.
- **Supply of Loanable Funds**: From national saving.
- **Demand for Loanable Funds**: For domestic investment and net capital outflow.

**Axes**:
- **Real Interest Rate**
- **Quantity of Loanable Funds**
The Market for Loanable Funds

- At the equilibrium interest rate, the amount that people want to save exactly balances the desired quantities of domestic investment and net foreign investment.
The two sides of the foreign-currency exchange market are represented by NCO and NX.

- NCO represents the imbalance between the purchases and sales of capital assets.
- NX represents the imbalance between exports and imports of goods and services.
• Example of Paired Transactions
  • A Swiss firm buys a machine for CHF 1000 from a Danish firm. The Swiss firm transfers CHF 1000 to the Danish firm’s bank account in Zurich.
    • This transaction creates the following two offsetting entries in the Swiss balance of payments:
      • It enters the Swiss current account (NX) with a negative sign ($\Delta NX = -\text{CHF 1000}$).
      • It shows up as a credit in the Swiss financial account ($\Delta \text{NCO} = -\text{CHF 1000}$).
    • That is, Switzerland gets goods in return for assets.
The Market for Foreign-Currency Exchange

- For an economy as a whole, $NCO$ and $NX$ must balance, or:

$$NCO = NX$$

- In the market for foreign-currency exchange, Swiss Franks are traded for foreign currencies.

- The price that balances the supply and demand for foreign-currency is the real exchange rate.
The Market for Foreign-Currency Exchange

• The demand curve for foreign currency is downward sloping because a higher exchange rate makes domestic goods more expensive.

• The supply curve is vertical because the quantity of Swiss Franks supplied for net capital outflow is unrelated to the real exchange rate.
Figure 2: The Market for Foreign-Currency Exchange

- Supply of Swiss Franks (from net capital outflow)
- Demand for Swiss Franks (for net exports)

Equilibrium real exchange rate

Equilibrium quantity

Quantity of Swiss Franks Exchanged into Foreign Currency
The Market for Foreign-Currency Exchange

- The real exchange rate adjusts to balance the supply and demand for Swiss Franks.
- At the equilibrium real exchange rate, the demand for Swiss Franks to buy net exports exactly balances the supply of Swiss Franks to be exchanged into foreign currency to buy assets abroad.
EQUILIBRIUM IN THE OPEN ECONOMY

• In the market for loanable funds, supply comes from national saving and demand comes from domestic investment and net capital outflow.

• In the market for foreign-currency exchange, supply comes from net capital outflow and demand comes from net exports.
EQUILIBRIUM IN THE OPEN ECONOMY

• Net capital outflow links the loanable funds market and the foreign-currency exchange market.
  • The key determinant of net capital outflow is the real interest rate.
Figure 3 How Net Capital Outflow Depends on the Interest Rate

Net capital outflow is negative.

Net capital outflow is positive.
Simultaneous Equilibrium in Two Markets

- Prices in the loanable funds market and the foreign-currency exchange market adjust simultaneously to balance supply and demand in these two markets.
- As they do, they determine the macroeconomic variables of national saving, domestic investment, net foreign investment, and net exports.
Figure 4 The Real Equilibrium in an Open Economy

(a) The Market for Loanable Funds

(b) Net Capital Outflow

(c) The Market for Foreign-Currency Exchange
HOW POLICIES AND EVENTS AFFECT AN OPEN ECONOMY

• The magnitude and variation in important macroeconomic variables depend on the following:
  • Government budget deficits
  • Trade policies
  • Political and economic stability
In an open economy, government budget deficits...

- reduce the supply of loanable funds,
- drive up the interest rate,
- crowd out domestic investment,
- cause net foreign investment to fall.
1. A budget deficit reduces the supply of loanable funds . . .

2. . . . which increases the real interest rate . . .

3. . . . which in turn reduces net capital outflow.

4. The decrease in net capital outflow reduces the supply of Franks to be exchanged into foreign currency . . .

5. . . . which causes the real exchange rate to appreciate.
Government Budget Deficits

- Effect of Budget Deficits on the Loanable Funds Market
- A government budget deficit reduces national saving, which . . .
  - shifts the supply curve for loanable funds to the left, which . . .
  - raises interest rates.
Government Budget Deficits

• Effect of Budget Deficits on Net Foreign Investment
  • Higher interest rates reduce net foreign investment.

• Effect on the Foreign-Currency Exchange Market
  • A decrease in net foreign investment reduces the supply of Swiss Franks to be exchanged into foreign currency.

• This causes the real exchange rate to appreciate.
Trade Policy

- A *trade policy* is a government policy that directly influences the quantity of goods and services that a country imports or exports.
- Tariff: A tax on an imported good.
- Import quota: A limit on the quantity of a good produced abroad and sold domestically.
Trade Policy

• Because they do not change national saving or domestic investment, trade policies do not affect the trade balance.
  • For a given level of national saving and domestic investment, the real exchange rate adjusts to keep the trade balance the same.
• Trade policies have a greater effect on microeconomic than on macroeconomic markets.
Trade Policy

- Effect of an Import Quota
- Because foreigners need Swiss Franks to buy Swiss net exports, there is an increased demand for Swiss Franks in the market for foreign-currency.
  - This leads to an appreciation of the real exchange rate.
Trade Policy

- **Effect of an Import Quota**
  - There is no change in the interest rate because nothing happens in the loanable funds market.
  - There will be no change in net exports.
  - There is no change in net foreign investment even though an import quota reduces imports.
Trade Policy

• Effect of an Import Quota
  • An appreciation of the Swiss Frank in the foreign exchange market encourages imports and discourages exports.
  • This offsets the initial increase in net exports due to the import quota.
Figure 6 The Effects of an Import Quota

(a) The Market for Loanable Funds

- Real Interest Rate
- Supply
- Demand
- Quantity of Loanable Funds

(b) Net Capital Outflow

- Real Interest Rate
- Net Capital Outflow
- NCO

(c) The Market for Foreign-Currency Exchange

- Real Exchange Rate
- Supply
- Quantity of Swiss Franks

1. An import quota increases the demand for Swiss Franks.
2. . . and causes the real exchange rate to appreciate.
3. Net exports, however, remain the same.
Trade Policy

• Effect of an Import Quota
  • Trade policies do not affect the trade balance.
Political Instability and Capital Flight

- *Capital flight* is a large and sudden reduction in the demand for assets located in a country.
Political Instability and Capital Flight

• Capital flight has its largest impact on the country from which the capital is fleeing, but it also affects other countries.

• If investors become concerned about the safety of their investments, capital can quickly leave an economy.

• Interest rates increase and the domestic currency depreciates.
Political Instability and Capital Flight

• When investors around the world observed political problems in Mexico in 1994, they sold some of their Mexican assets and used the proceeds to buy assets of other countries.
• This increased Mexican net capital outflow.
  • The demand for loanable funds in the loanable funds market increased, which increased the interest rate.
  • This increased the supply of pesos in the foreign-currency exchange market.
Figure 7 The Effects of Capital Flight

(a) The Market for Loanable Funds in Mexico

- An increase in net capital outflow...
- Increases the demand for loanable funds...
- Increases the interest rate.

(b) Mexican Net Capital Outflow

- 1. An increase in net capital outflow...
- Increases the supply of pesos...
- Causes the peso to depreciate.

(c) The Market for Foreign-Currency Exchange
To analyze the macroeconomics of open economies, two markets are central—the market for loanable funds and the market for foreign-currency exchange.

In the market for loanable funds, the interest rate adjusts to balance supply for loanable funds (from national saving) and demand for loanable funds (from domestic investment and net capital outflow).
• In the market for foreign-currency exchange, the real exchange rate adjusts to balance the supply of Swiss Franks (for net capital outflow) and the demand for Swiss Franks (for net exports).

• Net capital outflow is the variable that connects the two markets.
Summary

- A policy that reduces national saving, such as a government budget deficit, reduces the supply of loanable funds and drives up the interest rate.
- The higher interest rate reduces net capital outflow, reducing the supply of Swiss Franks.
- The Swiss Frank appreciates, and net exports fall.
Summary

• A trade restriction increases net exports and increases the demand for Swiss Franks in the market for foreign-currency exchange.

• As a result, the Swiss Frank appreciates in value, making domestic goods more expensive relative to foreign goods.

• This appreciation offsets the initial impact of the trade restrictions on net exports.
Summary

• When investors change their attitudes about holding assets of a country, the ramifications for the country’s economy can be profound.
• Political instability in a country can lead to capital flight.
• Capital flight tends to increase interest rates and cause the country’s currency to depreciate.