Learning Resource

B.Com. 2nd Semester Honours
Economics
GE 2T: Macro Economics

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Unit-IV: Open economy

A closed economy is one that does not interact with other economies in the world. There are no exports, no imports, and no capital flows. An open economy is one that interacts freely with other economies around the world. An open economy interacts with other countries in two ways. It buys and sells goods and services in world product markets. It buys and sells capital assets in world financial markets.

THE INTERNATIONAL FLOW OF GOODS AND CAPITAL

The United States is a very large and open economy—it imports and exports huge quantities of goods and services. Over the past four decades, international trade and finance have become increasingly important.

The Flow of Goods: Exports, Imports, Net Exports

Exports are goods and services that are produced domestically and sold abroad. Imports are goods and services that are produced abroad and sold domestically. Net exports (NX) are the value of a nation's exports minus the value of its imports. Net exports are also called the trade balance. A trade deficit is a situation in which net exports (NX) are negative. Imports > Exports A trade surplus is a situation in which net exports (NX) are positive. Exports > Imports. Balanced trade refers to when net exports are zero—exports and imports are exactly equal.

Factors that affect net exports

The tastes of consumers for domestic and foreign goods. The prices of goods at home and abroad. The exchange rates at which people can use domestic currency to buy foreign currencies. The incomes of consumers at home and abroad. The costs of transporting goods from country to country. The policies of the government toward international trade.

The Flow of Financial Resources: Net Capital Outflow

Net capital outflow refers to the purchase of foreign assets by domestic residents minus the purchase of domestic assets by foreigners. A U.S. resident buys stock in the Toyota corporation and a Mexican buys stock in the Ford Motor corporation. When a U.S. resident buys stock in Telmex, the Mexican phone company, the purchase raises U.S. net capital outflow. When a

Japanese resident buys a bond issued by the U.S. government, the purchase reduces the U.S. net capital outflow.

Variables that Influence Net Capital Outflow

The real interest rates being paid on foreign assets. The real interest rates being paid on domestic assets. The perceived economic and political risks of holding assets abroad. The government policies that affect foreign ownership of domestic assets.

The Equality of Net Exports and Net Capital Outflow

Net exports (NX) and net capital outflow (NCO) are closely linked. For an economy as a whole, NX and NCO must balance each other so that: NCO = NX. This holds true because every transaction that affects one side must also affect the other side by the same amount.

Saving, Investment, and Their Relationship to the International Flows

Net exports are a component of GDP: Y = C + I + G + NX. National saving is the income of the nation that is left after paying for current consumption and government purchases: Y - C - G = I + NX. National saving (S) equals Y - C - G so: S = I + NX or Saving (S) = Domestic Investment (I) + Net Capital Outflow (NCO).

THE PRICES FOR INTERNATIONAL TRANSACTIONS: REAL AND NOMINAL EXCHANGE RATES

International transactions are influenced by international prices. The two most important international prices are the nominal exchange rate and the real exchange rate.

Nominal Exchange Rates

The nominal exchange rate is the rate at which a person can trade the currency of one country for the currency of another. The nominal exchange rate is expressed in two ways. In units of foreign currency per one U.S. dollar. And in units of U.S. dollars per one unit of the foreign currency. Assume the exchange rate between the Japanese yen and U.S. dollar is 80 yen to one dollar. One U.S. dollar trades for 80 yen. One-yen trades for 1/80 (= 0.0125) of a dollar. Appreciation refers to an increase in the value of a currency as measured by the amount of foreign currency it can buy. Depreciation refers to a decrease in the value of a currency as measured by the amount of foreign currency it can buy. If a dollar buys more foreign currency, there is an appreciation of the dollar. If it buys less there is a depreciation of the dollar.

Real Exchange Rates

The real exchange rate is the rate at which a person can trade the goods and services of one country for the goods and services of another. The real exchange rate compares the prices of domestic goods and foreign goods in the domestic economy. If a case of German beer is twice as expensive as American beer, the real exchange rate is 1/2 case of German beer per case of American beer. The real exchange rate depends on the nominal exchange rate and the prices of goods in the two countries measured in local currencies. The real exchange rate is a key determinant of how much a country exports and imports.

Real exchange rate = (Nominal exchange rate * Domestic price) / Foreign price

A depreciation (fall) in the U.S. real exchange rate means that U.S. goods have become cheaper relative to foreign goods. This encourages consumers both at home and abroad to buy more U.S. goods and fewer goods from other countries. As a result, U.S. exports rise, and U.S. imports fall, and both of these changes raise U.S. net exports. Conversely, an appreciation in the U.S. real exchange rate means that U.S. goods have become more expensive compared to foreign goods, so U.S. net exports fall.

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.

The Basic Logic of Purchasing-Power Parity

Purchasing-power parity is a theory of exchange rates whereby a unit of any given currency should be able to buy the same quantity of goods in all countries. According to the purchasing-power parity theory, a unit of any given currency should be able to buy the same quantity of goods in all countries. The theory of purchasing-power parity is based on a principle called the law of one price. According to the law of one price, a good must sell for the same price in all locations. If the law of one price were not true, unexploited profit opportunities would exist. The process of taking advantage of differences in prices in different markets is called arbitrage. If arbitrage occurs, eventually prices that differed in two markets would necessarily converge. According to the theory of purchasing-power parity, a currency must have the same purchasing power in all countries and exchange rates move to ensure that.

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. 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.

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.

Balance of Payments Accounting

The balance of payments tracks payments to and from foreigners. Transactions resulting in a payment to a foreigner enter as a debit (-) (imports of goods, services, assets). A US firm imports banana from Mexico - transaction resulting in a payment to foreigners, so a debit. Transactions resulting in a payment from a foreigner enter as a credit (+) (exports of goods services, assets). The US firm pays for the bananas by writing a check on a US bank. Mexico receives the check and must do something with it. Let’s say it deposits it into a US bank. Therefore, the US bank has sold an asset - the demand deposit - to Mexico. The sale of the asset results in the need for a payment from a foreigner (the check) and enters as a credit (+). Double-entry book-keeping - each transaction enters twice - import bananas and pay for them by exporting a bank deposit.

Accounts in the balance of payments

Current account = net exports of goods and services (NX) + net income from abroad (NFP) + unilateral transfers. To understand unilateral transfers - country exports an asset (perhaps dollars in a bank account) and doesn't really import anything - create the item unilateral transfer to indicate the off-setting import transaction.

Capital and Financial account

Capital account is non-market transfers - very small and unimportant for US. Financial account is net exports of assets and is large and important. Official settlements balance is a subset of the financial account and measures net exports official reserve assets - a central bank can export reserves to help pay for a current account deficit. Current Account + Capital and Financial Account = 0, CA + KFA = 0. If we have net imports of goods must have net exports of assets to pay for them. Continued current account deficits imply continued capital and financial account surpluses as we export our assets to foreigners. BEA estimates net foreign debt at about 20.7% of US GDP ($2,484.2 billion at end of 2004). Yet, net foreign income from assets is positive.

Saving and Investment in a Small Open Economy

Income in an open economy includes net factor payments - goods market equilibrium. Y + NF P = C d + I d + G + NX + NFP = C + I + G + CA. Saving = Investment + Current Account. S d = (Y + NFP - T - C d) + (T - G) = I d + CA. Saving can increase capital stock through investment. Saving can increase net foreign assets through a current account surplus. Interest rate in a small open economy is determined in world markets, not in the small open economy. Graph - horizontal excess of savings over investment at the world interest rate is the current account surplus. Shocks which change desired investment. Shocks which change desired savings. National Wealth = Capital + Net Foreign Assets (NFA).

Sovereign Debt Crises

A country can borrow on international markets so that S d - I d = CA only if international creditors are confident that the country can repay the debt it is incurring. Government intertemporal budget constraint with outstanding debt (B): must plan to raise taxes not only to finance current and future spending, but to pay off initial debt. B + G + (Gf / 1 + r) = T + (T f / 1 + r). Future debt will grow (shrink) as taxes fall short of (exceed) finance government spending and interest payments on debt. B f - B = G + rB – T. Assume that the economy goes into a recession today such that government spending rises and taxes fall as policy responds to the needs of the recession. This implies that the government will increase its debt. Suppose additionally that the government has no credible means by which it can promise to cut future spending or raise future taxes. Response of international creditors? Response of domestic government? Alternatively, assume that world interest rates rise.

Sovereign Debt crises of the 1980's

Countries had high debt, partly due to oil price shocks of 1970's. Partly borrowing to finance investment in excess of saving along a growth path. US monetary policy to reduce inflation increased world interest rates and induced worldwide recession, reducing LDC exports and thereby reducing incomes and tax revenues. Countries were required to pay interest and

maturing debt. As long as countries have debt, they cannot even service (interest + maturing debt), cannot borrow on international markets.

Mexico 1994

Mexico had large CA deficits as Id > Sd. Large I meant rapid growth and ability to repay. Government had made recent reforms to reduce budget deficits and inflation. NAFTA fuelled expectations of growth. Crisis trigger - political instability caused investors to question whether government could maintain reforms - could government really deliver on low Gf and high Tf to enable it to pay off its debt? Foreign creditors suddenly withdrew funds. Since could not borrow, forced contractionary policies which caused recession.

Saving and Investment in a Large Open Economy

Assume that the world has two countries, a domestic country and a foreign country. These "countries" are relatively similar in size, maybe the US and Europe. World goods market equilibrium determines the world interest rate. S d + S d FOR = I d + I d FOR. Graphically - determine world interest rate and current account balance for each country. Note the world current account balance must be zero. Effect of a policy which reduces US saving. 1970's - large increase in OPEC savings due to high oil revenues. Early 1980's large reduction in US saving.

Fiscal Policy and the Current Account

What is the effect of a current tax cut on the current account?

The tax cut cannot occur alone as it would violate the government's budget constraint. We do not know what will adjust in the future to assure that the budget constraint holds. Or in some cases we cannot be sure that the government will not end up failing to adjust future policy and defaulting on debt. For now, assume the government is sure to repay. Let the tax cut be offset by a future tax increase. Since consumption depends on the present value of taxes and there is no change in the present value of taxes, there is no change in consumption. There is no effect on either saving or the current account. There is an increase in the current budget deficit to be offset in the future by a budget surplus. If agents were liquidity constrained then the tax cut might increase consumption and we would have a budget deficit and a current account deficit, "twin deficits". Let the tax cut be offset by a future government spending reduction. The present-value of taxes has fallen, so consumption rises. We have a current account deficit and a budget deficit, "twin deficits". Next period when government spending falls, we will have a current account surplus and a budget surplus, "twin surpluses".

What is an Exchange Rate?

An exchange rate is the value of one nation's currency versus the currency of another nation or economic zone. For example, how many U.S. dollars does it take to buy one euro?

Types of Exchange Rates

Free-Floating

A free-floating exchange rate rises and falls due to changes in the foreign exchange market.

Restricted Currencies

Some countries have restricted currencies, limiting their exchange to within the countries' borders. Also, a restricted currency can have its value set by the government.

Currency Peg

Sometimes a country will peg its currency to that of another nation. For instance, the Hong Kong dollar is pegged to the U.S. dollar in a range of 7.75 to 7.85. This means the value of the Hong Kong dollar to the U.S. dollar will remain within this range.

Onshore Vs. Offshore

Exchange rates can also be different for the same country. In some cases, there is an onshore rate and an offshore rate. Generally, a more favourable exchange rate can often be found within a country's border versus outside its borders. China is one major example of a country that has this rate structure. Additionally, China's yuan is a currency that is controlled by the government. Every day, the Chinese government sets a midpoint value for the currency, allowing the yuan to trade in a band of 2% from the midpoint.

Spot vs. Forward

Exchange rates can have what is called a spot rate, or cash value, which is the current market value. Alternatively, an exchange rate may have a forward value, which is based on expectations for the currency to rise or fall versus its spot price. Forward rate values may fluctuate due to changes in expectations for future interest rates in one country versus another. For example, let's say that traders have the view that the eurozone will ease monetary policy versus the U.S. In this case, traders could buy the dollar versus the euro, resulting in the value of the euro falling.

Quotation

Typically, an exchange rate is quoted using an acronym for the national currency it represents. For example, the acronym USD represents the U.S. dollar, while EUR represents the euro. To quote the currency pair for the dollar and the euro, it would be EUR/USD. In this case, the quotation is euro to dollar, and translates to 1-euro trading for the equivalent of $1.13 if the exchange rate is 1.13. In the case of the Japanese yen, it's USD/JPY, or dollar to yen. An exchange rate of 100 would mean that 1 dollar equals 100 yen.

Mundell-Fleming Model

The Mundell-Fleming Model (MFM) describes the workings of a small economy open to international trade in goods and financial assets, and provides a framework for monetary and fiscal policy analysis. The basic framework is a static, non-micro founded model extending the Keynesian IS-LM model. Indeed, the MFM shares with the IS-LM model the philosophical and methodological approach, and the basic features: the model is linear and the main assumption is that consumer prices are fixed. As a matter of fact, the MFM nests the IS-LM model as a special case, for a particular parameterisation.
The starting point of the IS-LM model, which describes a closed economy, is the income identity, which requires the equality between the overall output of the economy and the sum of absorption channels: private consumption (C), private investment (I) and public spending (G):

$Y = C + I + G$ ……...(1)

Rather than being just an identity, the above equation has also an alternative interpretation, since it defines the composition of aggregate demand and the clearing condition for the goods market. Each of the components above, indeed, describes the behaviour of one particular kind of agent that populates the economy. The first component (C) describes the behaviour of the household, and can be cast in the form of the following linear relation:

$$C = C° + c(Y - T)$$ ……... (2)

Private consumption, therefore, is an increasing function of personal income Y, net of taxes paid to the fiscal authority T: higher income levels make the budget constraint looser and support higher levels of spending. Parameter c defines the income elasticity of private consumption, also known as the "marginal propensity to consume", while C° captures an exogenous component to private consumption. The second component (I) describes the behaviour of firms, and can be cast in the form

$$I = I° - ai$$ …….. (3)

according to which the demand for private investment is decreasing in the interest rate (higher interest rates reduce the number of investment projects that are profitable enough to be preferred to bonds, which in turn pay the interest rate), with elasticity a. The third component, finally, describes the behaviour of the fiscal authority, controlling the amount of public spending (G = G°), and taxes collected according to the linear rule

$$T = T° + tY$$ …….. (4)

which implies that taxes consist of a lump-sum component (T°) and a component proportional to income, with t being the marginal tax rate.

The MFM, therefore, extends such framework to an open economy. For the goods market, this implies some additional components of aggregate demand. In particular, in an open economy, both consumption and investment goods produced domestically may be demanded and purchased by foreign agents. In this case, we talk about "exports" (X). Similarly, domestic consumers and firms may demand and purchase consumption and investment goods produced abroad. In this case, we talk about "imports" (M). The difference between these components measures the "Net Exports" (NX=X-M). The income identity for the case of an open economy accounts for such an additional component:

$$Y = C + I + G + NX$$ …….. (5)

In this case, indeed, C and I capture the total demand of domestic agents for consumption and investment goods, including both domestic and foreign goods. On the other hand, Y measures domestic production of goods, regardless of the fact that the final use of these goods takes place domestically or abroad. The term NX accounts for this discrepancy, by subtracting the part of the domestic demand that involves foreign goods (M) and adding the part of domestically produced goods directed to the foreign market (X).To fully understand this additional component and how it is related to the rest of the macroeconomy, it is necessary at this point to introduce an additional macroeconomic variable, which the IS-LM model lacks, as it is peculiar of a system open to international relations: the exchange rate. The nominal exchange rate (e) defines the price of domestic currency in units of foreign currency. Given this definition, an increase in e implies an appreciation of the domestic currency (you need more dollars to buy one euro), while on the contrary a reduction in e implies a depreciation of the

domestic currency. This additional variable is key to understand the behaviour of the agents that interact in the international markets, because a domestic consumer purchasing a foreign good has to pay a price denominated in a foreign currency. To evaluate how convenient that good is, in relation to a substitute good produced at home, the consumer has to compare the respective prices, and in order to do that he/she has to convert them in a common currency. To this end, he/she is going to use precisely the exchange rate. Moreover, with respect to this additional variable, we also define the monetary regime: in particular, the Central Bank can leave the exchange rate free to fluctuate in response to the varying international economic conditions, or else it can commit to the target of a given value (or interval) for the domestic currency. In the first case we talk about a regime of *flexible* exchange rates; while in the second case, we talk about *fixed* exchange rates. As the exchange rate appreciates, exports fall (since domestic goods are more expensive to foreign consumers) and imports increase (since foreign goods are cheaper to domestic agents). Accordingly, given the definition of the exchange rate specified above, we can represent the net exports as a decreasing function of the exchange rate:

$$NX = NX^{\circ} - bY - qe \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (6)$$

in which *b* and *q* capture the output and exchange-rate elasticity of net exports, respectively, and NX° measures the exogenous component (depending e. g. upon the level of foreign output). Using the equilibrium condition (5), and the behavioural equations describing the several components, we can write the open-economy version of the IS schedule as:

$$[1 - c(1-t) - b]Y = A^{\circ} - ai - qe \quad \ldots\ldots\ldots\ldots\ldots\ldots (7)$$

The open-economy IS curve is therefore a decreasing function of both the interest rate (as in the closed-economy framework) and the exchange rate:

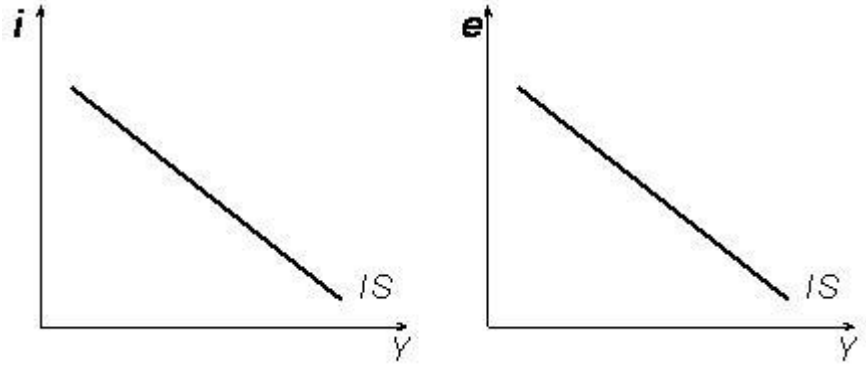

Figure 1. The open-economy IS curve, as a function of the interest rate (sx) and exchange rate (dx).

Changes in the exchange rate induce changes in aggregate demand and imply movements along the IS schedule, if the latter is drawn in the plane (Y, e), while they imply parallel shifts of the whole schedule, if it is drawn in the plane (Y, i).
The money market is described by the same equations as in the closed-economy framework. The money demand reflects the three Keynesian determinants and is therefore increasing in total output and decreasing in the interest rate:

$$M^{d} = kY - mi \quad \ldots\ldots\ldots\ldots\ldots\ldots (8)$$

The money supply, in its baseline formulation, is instead exogenous and under the direct control of the Central Bank, and is therefore the monetary policy instrument ($M^s = M°$). The LM schedule, describing the clearing of the money market ($M^d = M^s$), defines therefore a positive relation between output and interest rate, just as in the closed-economy version of the model:

$$kY = M° + mi \quad \text{..... (9)}$$

The level of money supply determines the location of the schedule in the plane (Y, i). In a closed economy, equilibrium in both goods and money markets is sufficient to describe the general equilibrium of the economy (equilibrium in the residual bond market is ensured by the Walras' law). In an open economy, instead, general equilibrium requires in addition also the equilibrium in the external sector, described by the Balance of Payments, which records all international transactions. In particular, the Balance of Payments consists of the sum of the current account (the trade balance) and the capital account (the capital flow). The trade balance is measured by the net exports, and depends upon domestic output and the exchange rate, as discussed above. The capital flow (CF), instead, is increasing in the differential between domestic and foreign interest rates:

$$CF = \beta(i - i^*) \quad \text{..... (10)}$$

As the domestic interest rate increases above the foreign one, financial assets denominated in the domestic currency pay relatively better than foreign assets, and the domestic country experiences a capital inflow (CF >0). Such inflow is the stronger the higher elasticity β. Therefore, equilibrium in the external sector can be described by the schedule BB, defining the locus of output and interest-rate combinations which ensure:

$$NX + CF = NX° - bY - qe + \beta(i - i^*) = 0 \quad \text{..... (11)}$$

Such relation is positively sloped, similarly to the relation described by the LM curve. On the external sector, the MFM imposes specific assumptions. In particular, the model assumes that: 1. the economy is a small open economy; 2. domestic and foreign assets are perfect substitutes for each other; and 3. there are no restrictions of any kind on capital movements across the border. Direct implications of these assumptions are that: 1. the foreign interest rate is exogenous to the domestic conditions; 2. the capital flows depend solely on the interest-rate differential; and 3. the elasticity of capital flows with respect to the interest-rate differential β is infinite. These implications are reflected in the position and slope of the BB schedule, describing the equilibrium in the external sector:

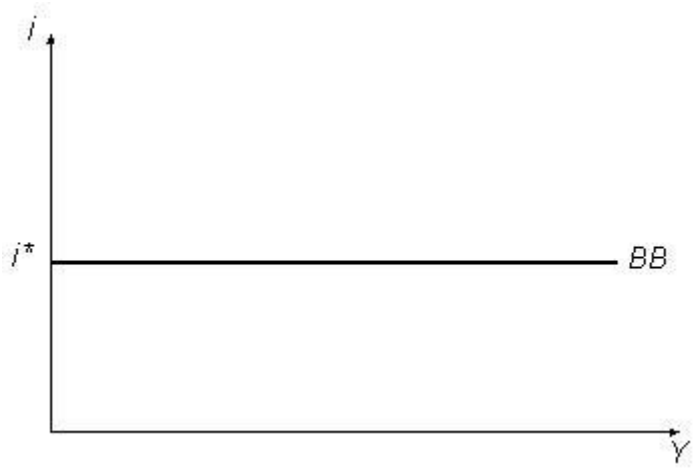

Figure 2. The equilibrium condition in the external sector: the BB schedule.

In particular, the BB schedule is horizontal, with intercept equal to the foreign interest rate: even an infinitesimal differential between domestic and foreign interest rates, given perfect substitutability and zero-restrictions to capital movements, would indeed induce an infinite capital flow across the border. Therefore, equilibrium in the external sector requires i = i*. The general equilibrium is achieved when all markets clear at the same time. In the context of the MFM, this requires a triple of output, interest and exchange rates at which all equilibrium conditions (equations 7, 9, and 11) are satisfied. From a graphical perspective, this requires the intersection of the IS, LM and BB schedules in a single point:

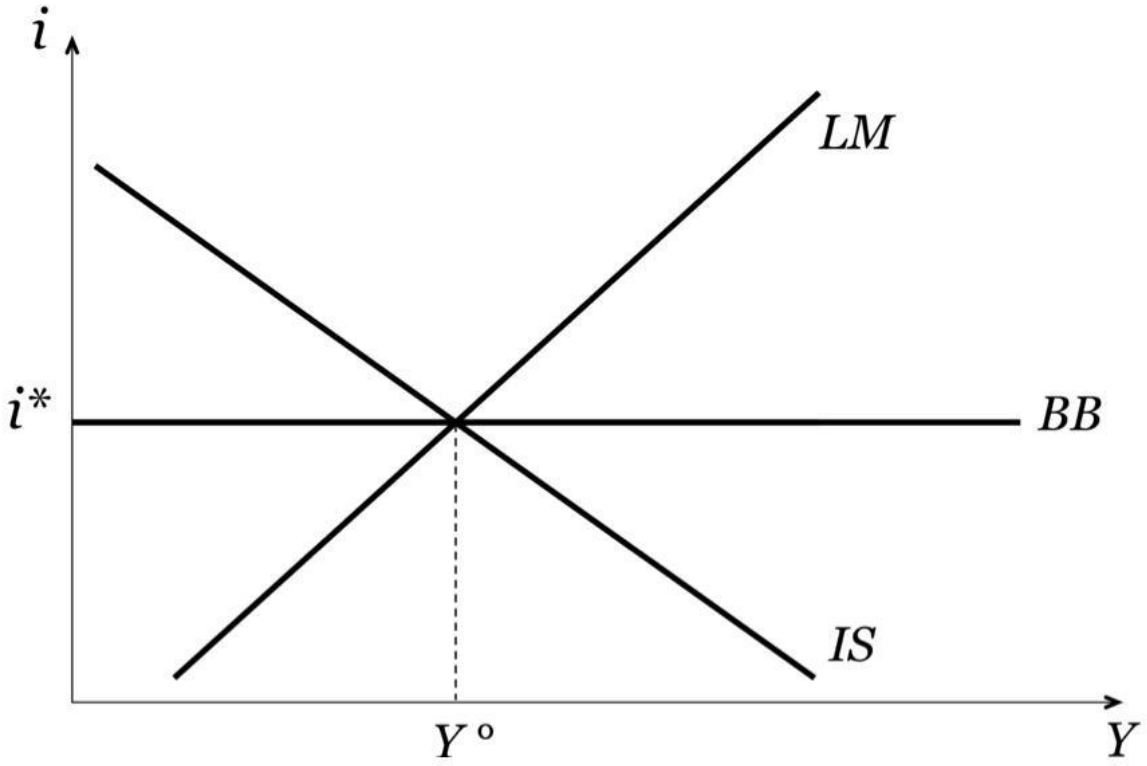

Figure 3. General equilibrium in the Mundell-Fleming Model.

From an analytical perspective, the solution to the model depends on the specific exchange-

rate regime. With flexible exchange rates, the system can be solved recursively: equilibrium in the external sector determines the domestic interest rate (i =i*, and therefore the position of the BB curve), equilibrium in the money market determines the level of output Y°, given the equilibrium domestic interest rate (from the intersection of LM and BB), and finally the equilibrium in the goods market, given the levels of output and interest rate found earlier, implies the equilibrium level of the exchange rate (and therefore the position of the IS schedule that ensures a unique intersection among the BB, IS and LM curves). With fixed exchange rates, the Central Bank commits itself to support a specific level of the exchange rate (for example e°). Since the monetary policy instrument is money supply (Ms), this regime implies that the latter is determined endogenously to support the exchange rate target. In this context, the system can also be solved recursively, although following a different order: equilibrium in the external sector determines the domestic interest rate, i =i*; given such value, and the target level for the exchange rate (e°), equilibrium in the goods market determines the equilibrium level for the real output (from the intersection between BB and IS, whose position is determined by e°). Finally, the equilibrium in the money market yields the level of money supply consistent with both equilibrium output Y° and target level of the exchange rate e° (i.e. it determines the position of the LM schedule by ensuring a unique intersection with BB and IS). The specific exchange rate regime has important consequences for the analysis of the effects of monetary and fiscal policy. Specifically, with flexible exchange rates, monetary policy is most effective because it is amplified by the fluctuations of the exchange rate that it induces. On the contrary, fiscal policy has no effect at all on the real activity, because it is completely sterilised by the exchange rate reaction. Indeed, a monetary expansion shifts the LM schedule out in LM'. The excess money supply induces downward pressures on the interest rate, which in a closed economy would raise the speculative demand for money and close the excess supply. In an open economy, however, the downward pressures on the interest rate translate immediately into capital outflow and a consequent depreciation of the domestic currency (given the infinite elasticity of the capital flow to the interest-rate differential). The currency depreciation, in turn, makes domestic goods more competitive on the international markets and the foreign demand for domestic goods thereby increases: net exports rise and the IS schedule shifts out in IS'. The increase in net exports raises equilibrium output from Y° to Y' and consequently the transactions demand for money: the money market clears even if the interest rate does not move.

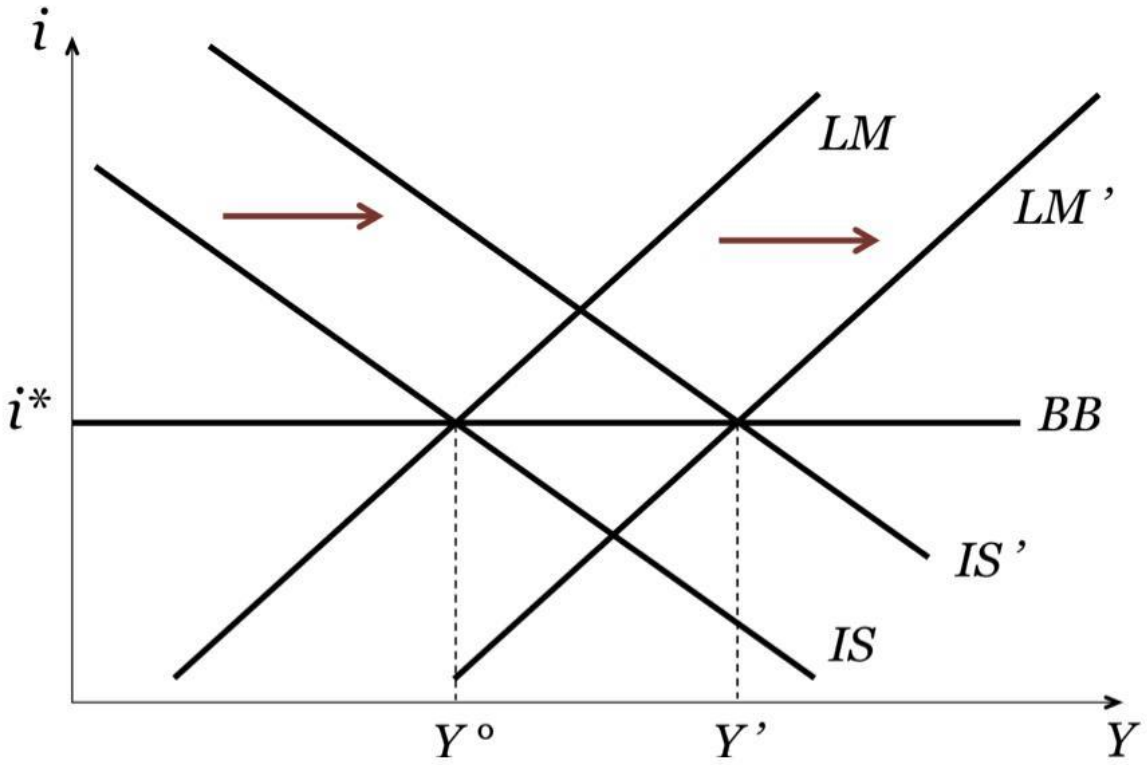

Figure 4. The effects of a monetary expansion with flexible exchange rates

The overall effectiveness of monetary policy is stronger than in a closed economy because the transmission mechanism only works through the exchange rate, with no variations in the interest rate: in a closed economy, instead, the interest rate falls, investment and output rise, and the excess money supply is closed by means of an increase in both transactions and speculative money demand. Fiscal policy, on the contrary, is completely ineffective with respect to equilibrium output. An increase in public spending, indeed, shifts the IS curve out into IS’, raising domestic demand. By doing so, however, it induces upward pressures on the interest rate (for a given money supply), which in turn translate into an appreciation of the domestic currency and a reduction of net exports: the fall in foreign demand is exactly the same as the increase in domestic one. Public spending, therefore, crowds out net exports completely, and the IS curve shifts back in IS’’. Interest rate and output do not change and the only effect that fiscal policy exerts is an appreciation of the exchange rate. Although ineffective with respect to output, however, it is worth noticing that fiscal policy is not ineffective altogether: indeed, it induces an income redistribution between agents producing goods for the foreign markets and those producing goods for the domestic one.

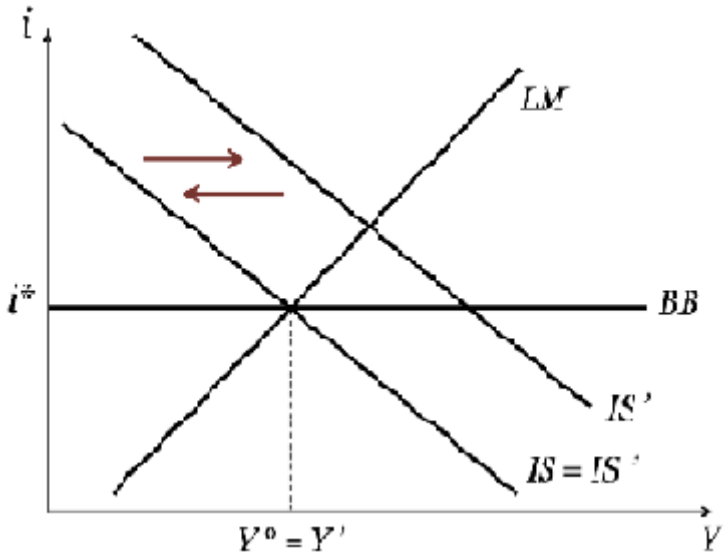

Figure 5. The effects of a fiscal expansion with flexible exchange rates.

The policy implications are completely reversed with fixed exchange rates. Monetary policy is ineffective because money supply cannot be affected without violating the exchange rate target. A monetary expansion, indeed, by inducing downward pressures on the interest rate, would imply a depreciation of the domestic currency, in contrast with the exchange rate target. To meet the target, then, the Central Bank would have to close the excess supply of domestic currency on the international currency markets by selling foreign currency in exchange for the domestic one: money supply falls and the LM shifts back in. Equilibrium output therefore remains unaffected, just like the interest and exchange rates: the only effect of the monetary expansion would be the replacement, within the assets side of the Central Bank's balance sheet, of foreign reserves with domestic bonds.

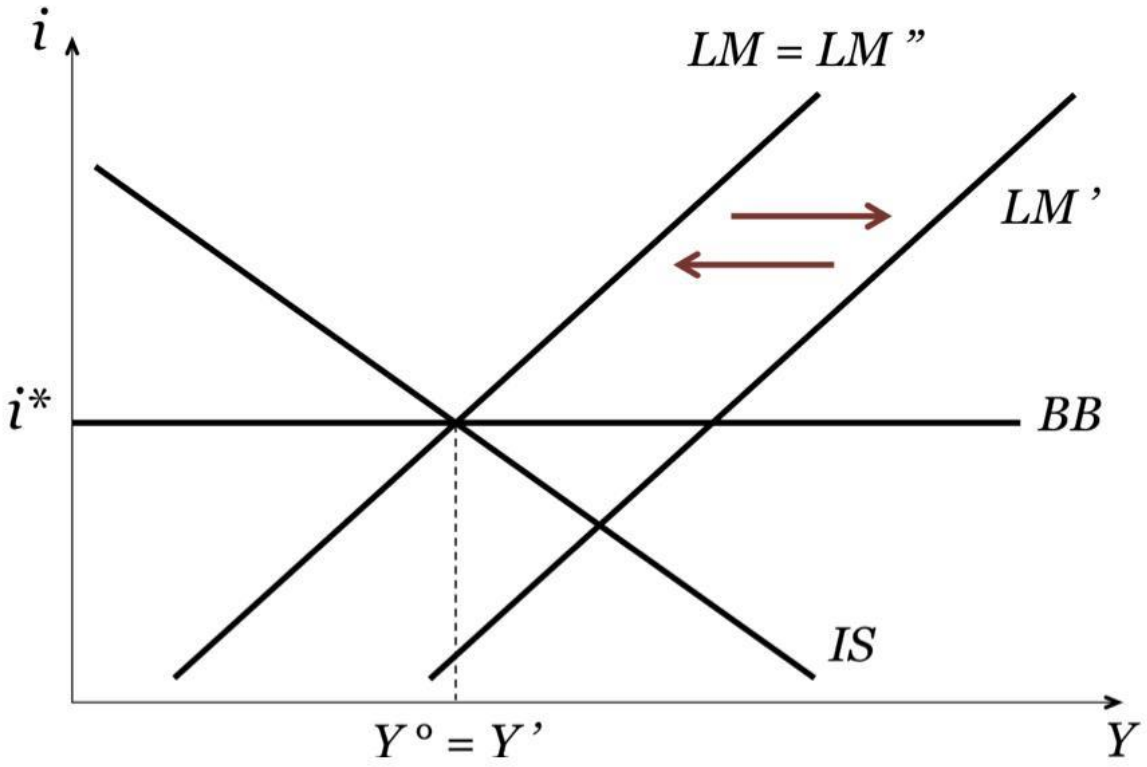

Figure 6. The effects of a monetary expansion with fixed exchange rates.

A fiscal expansion, on the contrary, is amplified by the response that the Central Bank needs to ensure to meet the exchange rate target. An increase in public spending, indeed, induces upward pressures on the interest rate and, consequently, an appreciation of the exchange rate. Such appreciation of the domestic currency makes the domestic Central Bank enter the international currency markets to close the excess demand of domestic currency, by purchasing foreign currency in exchange for the domestic one: the LM schedule shifts out, money supply increases and it accommodates the fiscal expansion. Equilibrium output increases from Y° to Y’, while neither the interest rate nor the exchange rate varies.

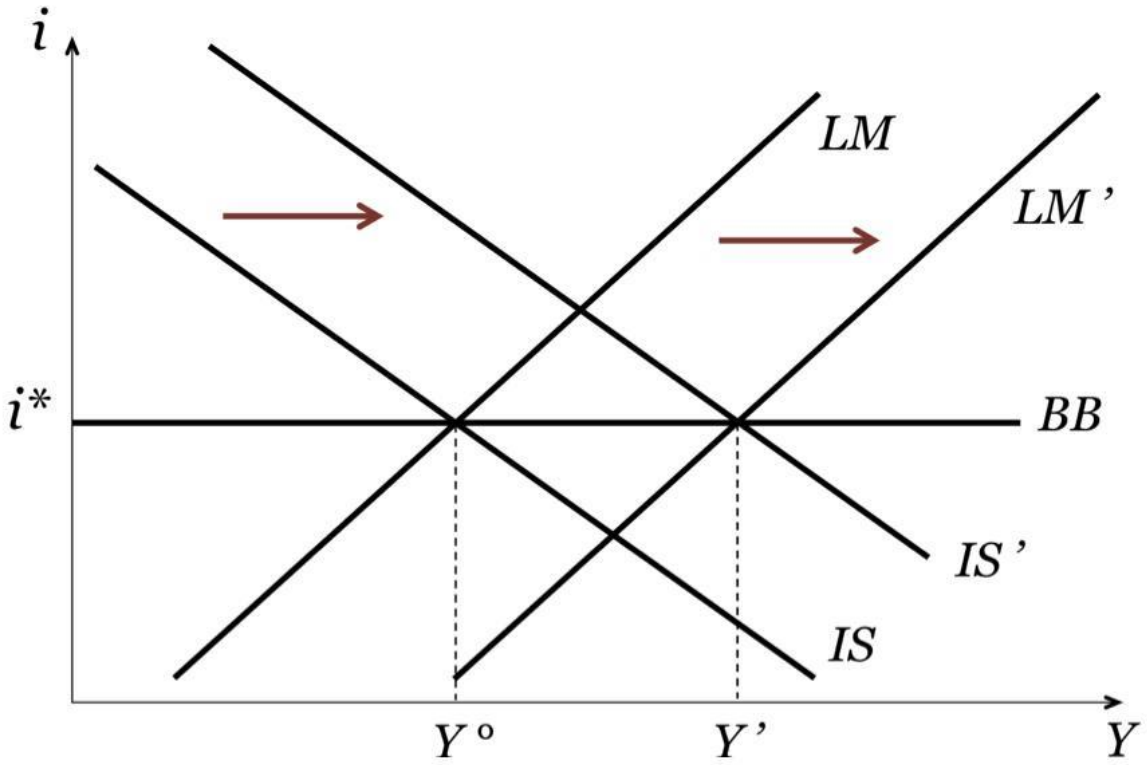

Figure 7. The effects of a fiscal expansion with fixed exchange rates.

The effectiveness on equilibrium output is stronger than in a closed economy because the exchange rate target forces the Central Bank to expand the money supply, preventing the domestic interest rate to rise and crowd out private spending, as it would instead happen in a closed economy.

What Is an Interest Rate Differential?

In general, an interest rate differential (IRD) weighs the contrast in interest rates between two similar interest-bearing assets. Traders in the foreign exchange market use IRDs when pricing forward exchange rates.

Based on the interest rate parity, a trader can create an expectation of the future exchange rate between two currencies and set the premium, or discount, on the current market exchange rate futures contracts.

Understanding Interest Rate Differential

Interest rate differentials simply measure the difference in interest rates between two securities. If one bond yields 5% and another 3%, the IRD would be 2 percentage points. IRD calculations are most often used in fixed income trading, forex trading, and lending calculations.

The interest rate differential is used in the housing market to describe the difference between the interest rate and a bank's posted rate on the prepayment date for mortgages. The IRD is a key component of the carry trade. A carry trade is a strategy that foreign exchange traders use in an attempt to profit from the difference between interest rates, and if traders are long a currency pair, they may be able to profit from a rise in currency pair.

Interest Rate Differential: A Trade Example

The IRD is the amount the investor can expect to profit using a carry trade. Say an investor borrows $1,000 and converts the funds into British pounds, allowing him to purchase a British bond. If the purchased bond yields 7% while the equivalent U.S. bond yields 3%, then the IRD equals 4%, or 7% - 3%. This profit is ensured only if the exchange rate between dollars and pounds remains constant.

One of the primary risks involved with this strategy is the uncertainty of currency fluctuations. In this example, if the British pound were to fall in relation to the U.S. dollar, the trader may experience losses.

Additionally, traders may use leverage, such as a factor of 10-to-1, to improve their profit potential. If the investor leveraged his borrowing by a factor of 10-to-1, he could make a profit of 40%. However, leverage could also cause large losses if there are large movements in exchange rates.

Interest Rate Differential: A Mortgage Example

When homebuyers borrow money to purchase houses, there may be an interest rate differential. For example, say a homebuyer purchased a home and took out a mortgage at a rate of 5.50% for 30 years. Assume 25 years have passed and the borrower only has five years left in his mortgage term. The lender could use the current market interest rate it is offering for a five-year mortgage to determine the interest rate differential. If the current market interest rate on a five-year mortgage is 3.85%, the interest rate differential is 1.65% or 0.1375% per month.

The Difference Between IRD and Net Interest Rate Differential (NIRD)

The net interest rate differential (NIRD) is a specific type of IRD used in Forex markets. In international currency markets, the NIRD is the difference in the interest rates of two distinct economic regions.

For instance, if a trader is long the NZD/USD pair, he or she owns the New Zealand currency and borrows the US currency. These New Zealand dollars can be placed into a New Zealand bank while simultaneously taking out a loan for the same amount from the U.S. bank. The net interest rate differential is the difference in any interest earned and any interest paid while holding the currency pair position.