Chapter 14

The Economics of Foreign Exchange in Emerging Markets

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Additional information is available at the end of the chapter

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Abstract

This chapter is to clarify macro issues and suggest main policy tools for emerging countries. Furthermore, financial markets, capital mobility and monetary policy are theoretically discussed. The exchange rate management (that is contractionary devaluation and real exchange rate rules) via exchange rate regimes is the purposed subject of this chapter, that is, consideration of open macroeconomic development policies for emerging markets. We take up three issues related to exchange rates in emerging countries for discussion. The first one is the concept and measurement of real exchange rates as well as exchange rate misalignment and its impact upon economic growth. The second topic taken up is the factors that are important in deciding upon the exchange rate regime and the exchange rate determination for emerging markets. Finally the dilemma problem of policy, in the face of sustained capital inflows, is discussed. A key economic feature that differentiates developed and developing countries is the structure of their financial systems.

Keywords: open economies, exchange rates, international finance, macroeconomics, international policies

1. Introduction

In this chapter, we mainly examine the macroeconomic problems of emerging countries. To be a developed country means not only being a mirror image of an emerging country's future but also having more economic qualifications than the emerging ones. For both developed and emerging countries, foreign exchange market is the oldest and intense one among the financial markets because of the financial integration and exchange rate crisis after the 1960s. The foreign exchange market is the center of attention not only for the firms but also for the people on the street. Exchange rate that is the principal of foreign exchange market is the key source of this attention. Here, the important problem is the determination of the real exchange rate.

There are various points of view made by authors in the economics literature. Up to middle of the 1980s, international goods and service flow, individuals' portfolio choices, interest rate, inflation, economic growth and money supply have been widely used in the exchange rate determination models. With these variables, seven types of exchange rate determination models were introduced. They are purchasing power parity (PPP), Mundell-Fleming approach (MFA), sticky price monetary model (SPMM), flexible price monetary model (FPMM), hybrid model (HM) or real interest differential model (RIDM), portfolio balance model (PBM) and currency substitution model (CSM) [1–4].

The purchasing power parity is the oldest approach among the exchange rate determination models. In most general terms, nominal exchange rate between two currencies and price level differentials is defined as purchasing power parity. Gustav Cassel, during the World War I, wrote [6]:

"At every moment the real parity between two countries is represented by this quotient between the purchasing power of the money in the one country and the other. I propose to call this parity 'the purchasing power parity'."

After Cassel, the term was widely used in the economics literature. PPP theory has two main variants. They are absolute PPP and relative PPP. The concept that is told about in the previous paragraph is often termed as the "absolute PPP." The relative PPP hypothesis states that percentage changes in exchange rate are equal to the difference between the percentage changes of the prices of two countries.

Mundell-Fleming approach has been developed in the early 1960s. MF model has had a huge impact on the theory of determination of exchange rates. Original model assumed static expectations and fixed prices. Furthermore, regressive expectations or rational expectations are relatively easier. Mundell-Fleming approach totally analyses the effects of the exchange rate differences under various types of exchange rate regimes [7, 8].

Sticky price monetary model, which is also known as the Dornbusch model, was first introduced by Rudiger Dornbusch in 1976. The model fits into the Keynesian tradition, i.e. stickiness of prices in labor and product markets. Dornbusch's observation is that financial markets seem to adjust more rapidly while product market adjusts slowly. According to Dornbusch, this point makes the base for SPMM [9, 10].

Flexible price monetary model, also known as the Frenkel model, was first introduced by Jacob Aharon Frenkel in 1976. A simple assumption for FPMM is that all prices are flexible. That is to say, aggregate supply curve is vertical, and a shift in aggregate demand has no effect on output. The model also assumes that PPP holds continuously. That is, IS part of IS-LM analysis is irrelevant here. Therefore only a slight shift in aggregate supply results in a change in output [11, 12].

In Ref. [13] Frankel indicates that sticky price monetary model is effective and applicable for the countries with low and stable inflation. On the other hand, flexible price monetary model is effective and applicable for the countries with high inflation. Besides these two extremities, Frenkel asserts that neither SPMM nor FPMM is applicable for the economies with moderate

inflation. Then, he introduces hybrid model or the so-called real-interest differential model that accommodates the flexible price and sticky price monetary models as special cases [4, 13, 14].

The important difference of portfolio balance model among the exchange rate determination models is the assumption of perfect substitution between the domestic and foreign assets. In this model, there is a long-run and a short-run differentiate. So, the exchange rate is evaluated in this concept. In the short run, exchange rate is determined by supply and demand of financial assets. However, in the long run, real factors are added to financial assets. Portfolio balance model is far more complex among the other models. The price of the complications is not only the problem. There exist some variables (such as wealth) that are difficult to measure in the model. Therefore, application of PBM is difficult in practice [4, 5, 9].

Individuals have more than one currency in their portfolio in currency substitution models. In other words, individuals' demand for money is defined not only for domestic currency but also for a group of currencies. There are two types of currency substitution models. The first type interprets either current account deficit or surplus as reflecting excess supply or demand of domestic currency relative to the foreign one. The second type of CSM considers money supply as being a worldwide object within the context of a highly integrated world capital market [18–20].

The plan of this chapter is as follows. The second section is titled "Capital mobility and IS-LM-BP model and effects on firms" and deals with types of capital mobility information and Mundell-Fleming approach that is one of the exchange rate determination models under different types of capital mobility. Thus, open macroeconomic policies will completely be examined for the emerging countries and firms of these countries. The exchange rate will play an important role for firms that export goods and import raw materials. Essentially, a depreciation (devaluation) will make exports cheaper, and exporting firms will benefit. However, firms importing raw materials will face higher costs of imports. An appreciation makes exports more expensive and reduces the competitiveness of exporting firms. However, at least raw materials (e.g., oil) will be cheaper following an appreciation. The final section will give the conclusions.

2. Capital mobility, IS-LM-BP model and effects on firms

There are three forms of foreign private capital flows to emerging countries. These are bond finance, commercial bank loans and foreign investment.

To increase capital inflow for investment, emerging countries can issue bonds to foreign investors. These bonds may be either in foreign or domestic currency. Of course there exist particular risks for the investors. There is an inflation risk when bonds are issued in the domestic currency, whereas they are also subject to default risk, in the sense that a poor country may not be able to reimburse the bond when bonds are issued in the foreign currency. If selling bond option does not work to raise capital, emerging countries may borrow from foreign commercial banks. Commercial bank loans may be either short term or long term. Also interest rates may be fixed or flexible by a group of banks or a single bank. The last form of

capital mobility is foreign direct investment. This is another type of capital flow to emerging countries. A multinational company may establish a new enterprise or expand its existing one.

Direct investment is the most important one among the three forms explained above. Therefore, capital flow as the form of direct investment is the driving force of growth and raises the employment in emerging country (see [1]).

As described in the first section, there are seven exchange rate determination models. However three of them are the fundamentals. These are Mundell-Fleming model, flexible price monetary model and sticky price monetary model. Together with foreign private capital flow information and different types of restrictions on capital flows, the common point for these three is that IS-LM-BP model is an important phenomenon in the exchange rate determination literature.

Mundell-Fleming model has a wide usage area among the open economy macro models. This model consists of a Keynesian structure and is the expanded form of IS-LM model. The Mundell-Fleming model is based on the following assumptions:

- Nominal wages and prices are constant.
- Aggregate demand is positively related with government expenditure (G), foreign output (Y_f) and exchange rate (e) and negatively related with domestic interest rate (r_d).
- Money demand (M_d) is a function of domestic interest rate (negatively) and domestic income (Y_d) level (positively).
- Money supply (M_s) is negatively affected from the deviation of exchange rate's targeting level.
- Trade account is determined by domestic output level.
- Capital account is determined by domestic and foreign real-interest rate differentials ($r_d - r_f$).

Constant wage and price assumptions state the distinct part of the Keynesian model that has a perfect elastic supply curve, i.e. output is determined by aggregate demand curve. The degree of capital flow is determined by the sensitivity of real-interest rate differentials in the Mundell-Fleming model [1].

Mundell-Fleming model combines the assumption of net international capital flow that depends on domestic interest rates and the simple Keynesian model consisting of goods and money markets. In the analysis, model focuses on the domestic money supply and interest rates as a monetary policy agent, while foreign prices and interest rates are exogenous [3].

BP curve is the balance of payments, and the slope of BP curve indicates the degree of capital movements. If BP curve is vertical, capital movements are completely limited. On the other hand, if BP curve is horizontal, free movements of capital occur, i.e. perfect capital mobility.

The equilibrium condition for commodity, money and currency markets is given in **Figure 1**. Point E shows the simultaneous equilibrium of all three markets with the internal and external balances at the same time. Points on the left (right) side of the IS curve indicate goods supply (demand) surplus. Points on the left (right) side of the LM curve indicate money demand

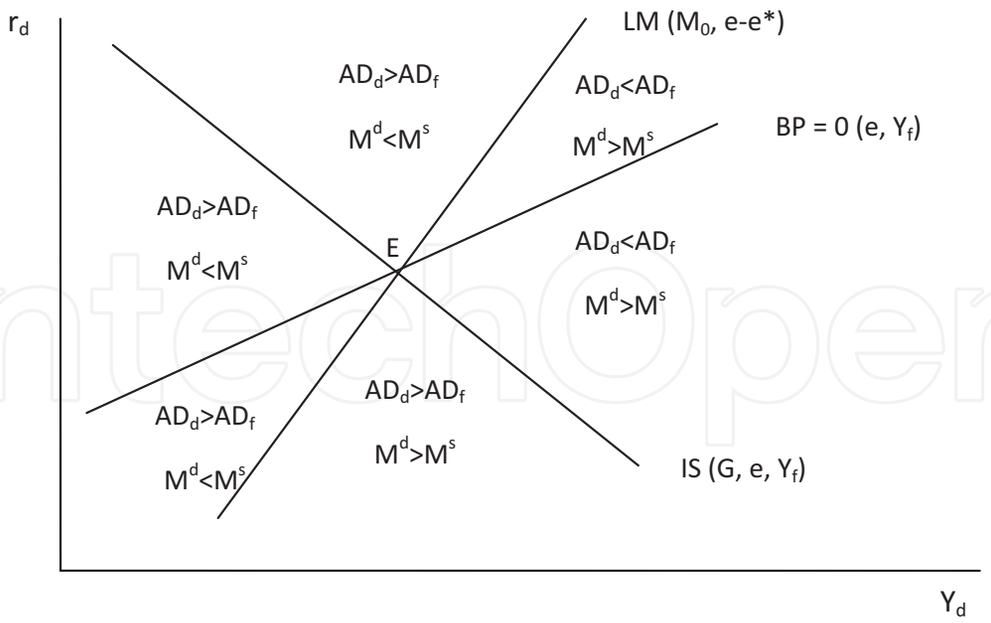

Figure 1. Internal and external balance under open economy.

(supply) surplus. If BP curve shifts to the right (left), this means the existence of a balance of payment deficit (surplus). This situation shows that capital flows are constant at a certain interest rate. However, more domestic income level means more trade deficit.

Three markets must be stable both inland and outland since unsterilized capital movements match up to perfectly elastic exchange rate regime at the fixed exchange rate regime. When the internal balance shifts to the left side of the balance of payments due to a shock, LM curve shifts to the left. Following this, if the exchange rate that gives rise in net exports is perfectly elastic, it will depreciate.

In an open economy, relative efficiency of monetary and fiscal policies depends on the degree of capital mobility and the applied exchange rate regime. Although most of the emerging economies are affiliated with international markets, there may be limitations in the capital movements. Therefore, it is difficult to say there exists a perfect liberalization. Interest rate does not have an important role in money demand since financial sector in emerging countries is not developed. Hence, LM curve is relatively vertical in emerging countries because of low sensitivity to interest rate.

According to the traditional approach of the Mundell-Fleming model, monetary devaluation has an expansionary effect on the output. Devaluation makes the cost of goods produced at home more expensive than the cost of goods produced from the rest of the world. This causes economic agents at home to consume more. The more the consumptions, the more the expansions in output become. This effect is known as the expenditure shift policy, and it is the fundamental expansionary channel of devaluation. On the other hand, devaluations in the 1990s, during the crisis in Asian economies, started to question this fundamental macroeconomic model. Living the economic collapses in the emerging countries makes the academicians and politicians deal with the expansionary and contractionary effects of devaluation.

2.1. Macroeconomics policy under the fixed exchange rate system

Central Bank can intervene at the currency through a fixed exchange rate regime by buying or selling bonds [8]. In this context, monetary and fiscal policies are examined particularly taking into account the capital mobility, whether perfect or not. Five successive equations below present the IS-LM-BP model by using I_0, S_0, Z_0, L_0 and K_0 constant terms. In these equations, investment, saving, import, net capital inflow, money demand, money supply (stock), interest rate and income are expressed with I, S, Z, K, L, M_s, r and y, respectively:

$$I = I_0 + I_r r \tag{1}$$

$$S = S_0 + S_y y \tag{2}$$

$$Z = Z_0 + Z_y y \tag{3}$$

$$M_s = L_0 + L_y y + L_r r \tag{4}$$

$$K = K_0 + K_r r \tag{5}$$

According to the five equations above, resulting IS-LM-BP equations and appropriate equilibrium points E_1 and E_2 are as follows:

$$\text{IS } \left(S_y + Z_y\right)y - I_r r = -S_0 - Z_0 + I_0 + G + X = E_1 \tag{6}$$

$$\text{LM } L_y y + L_r r = M_s - L_0 \tag{7}$$

$$\text{BP } -Z_y y + K_r r = -X + Z_0 - K_0 = E_2 \tag{8}$$

Government expenditure (G) and export level (X) variables are added. Equilibrium points can then be calculated using IS-LM-BP equations in matrix form:

$$\begin{pmatrix} S_y + Z_y & -I_r \\ -Z_y & K_r \end{pmatrix} \begin{bmatrix} y \\ r \end{bmatrix} = \begin{bmatrix} E_1 \\ E_2 \end{bmatrix} \tag{9}$$

$$\begin{bmatrix} y^e \\ r^e \end{bmatrix} = \begin{pmatrix} K_r/T & I_r/T \\ -Z_y/T & \left(S_y + Z_y\right)/T \end{pmatrix} \begin{bmatrix} E_1 \\ E_2 \end{bmatrix} \tag{10}$$

The result calculated in Eq. (10), while $T = K_r(S_y + Z_y) - I_r Z_y > 0$, gives the equilibrium for points y and r.

2.1.1. Monetary policy

The money supply Eq. (11) is found by putting the equilibrium points calculated in Eq. (10) to the LM equation:

$$M_s^e = L_0 + \left(L_y K_r + L_r Z_y\right)E_1 + \left[L_y I_r + L_r\left(S_y + Z_y\right)\right]E_2 \tag{11}$$

Money supply is constant in the equilibrium. It determines to conserve the defined fixed exchange rate. Monetary policy is only used for adjusting the currency reserve level and causes an economic imbalance. This result is independent from the international capital mobility [15]. Because an expansionary domestic credit shock places pressure on interest rates to decrease it, capital outflow starts and currency depreciates. So the intervention of Central Bank will be inevitable. Only way for Central Bank is to sell foreign currency from the reserve equal to the domestic credit expansion to avoid the depreciation of the exchange rate. Policymaker has to maintain value of the national currency because of fix exchange rate. Therefore, Central Bank sells dollar at the current exchange rate which leads to the tightening of money supply. **Figure 2** shows that LM curve will come back the original level at each case. As a result, monetary policy is totally ineffective. As described before, this result is independent from the international capital mobility and valid for all four cases.

2.1.2. Fiscal policy

To see the effect of fiscal policy, government expenditure (G) is taken exogenous. The following multipliers are calculated by taking total differentials of Eqs. (10) and (11):

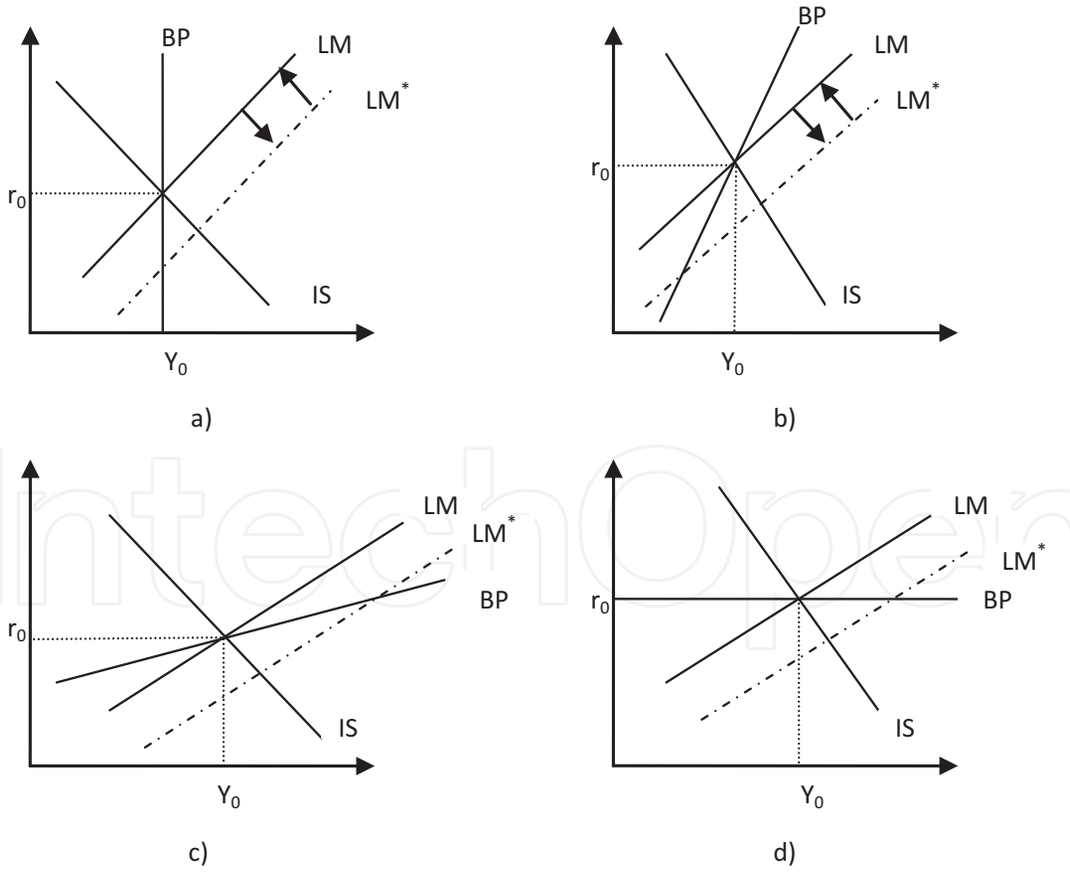

Figure 2. Monetary policy under fixed exchange rate. (a) Imperfect capital mobility, (b) low capital mobility, (c) high capital mobility and (d) perfect capital mobility.

$$\frac{dy^e}{dG} = \frac{K_r}{K_r(S_y + Z_y) - I_r Z_y} > 0 \tag{12}$$

$$\frac{dr^e}{dG} = \frac{Z_r}{K_r(S_y + Z_y) - I_r Z_y} > 0 \tag{13}$$

$$\frac{dM_s^e}{dG} = \frac{L_y K_r + L_r Z_y}{K_r(S_y + Z_y) - I_r Z_y} >< 0 \tag{14}$$

Fiscal policy effects under fixed exchange rate are examined in **Figure 3**. When capital mobility is perfect, $K_r \to \infty$ and multipliers Eqs. (12)–(14) are calculated as follows:

$$\frac{dy^e}{dG} = \frac{1}{S_y + Z_y} > 0 \tag{15}$$

$$\frac{dr^e}{dG} = 0 \tag{16}$$

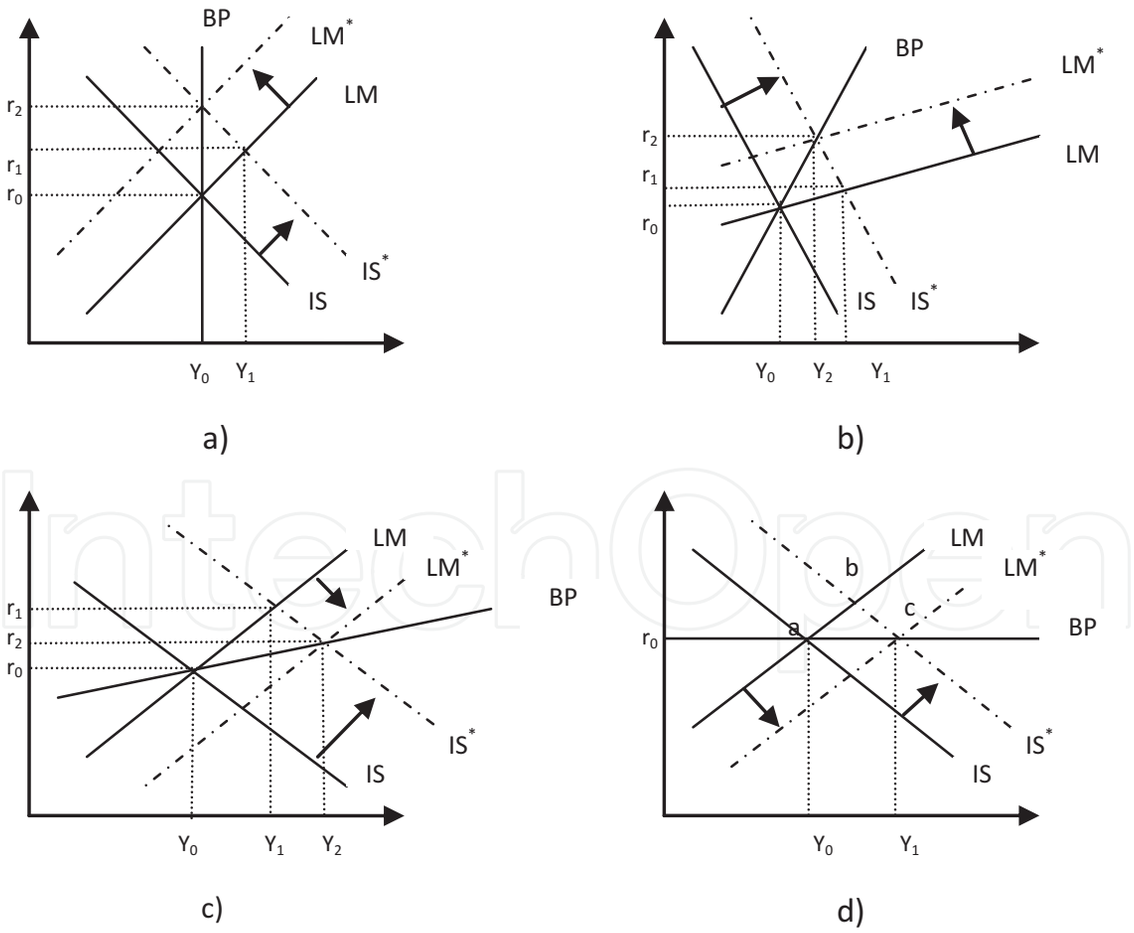

Figure 3. Fiscal policy under fixed exchange rate. (a) Imperfect capital mobility, (b) low capital mobility, (c) high capital mobility and (d) perfect capital mobility.

$$\frac{dM_s^e}{dG} = \frac{L_y}{S_y + Z_y} = L_y\left(\frac{dy^e}{dG}\right) > 0 \tag{17}$$

As shown in **Figure 3d**, when expansionary fiscal policy is applied at the point a with coordinates (r_0, Y_0), IS curve shifts to IS′. New equilibrium is now at point b. There is a balance of payment surplus at this point. This is the difference between expansionary fiscal policy and expansionary monetary policy. This surplus at point b means there exists a capital inflow. Thus, the monetary authority purchases dollar at the current currency to prevent the appreciation of the national currency. Then, the domestic money supply rises. Hence, LM curve shifts to LM′ and reaches the equilibrium at point c as shown in **Figure 3d**.

Under imperfect capital mobility is $K_r = 0$ (**Figure 3a**). After some manipulations the multipliers are as follows:

$$\frac{dy^e}{dG} = 0 \tag{18}$$

$$\frac{dr^e}{dG} = \frac{-1}{I_r} \tag{19}$$

$$\frac{dM_s^e}{dG} = \frac{-L_r}{I_r} \tag{20}$$

According to the calculated multipliers, after an expansionary fiscal policy, equilibrium money stock declines (Eq. (20)). This is because the higher interest rate induces liquidity choices. So currency reserves reduce at the same rate. At the last equilibrium while interest rate is increasing, income level can be as same as the beginning [15].

When capital mobility is high or imperfect, Eqs. (12)–(14) are used. As a response to fiscal mobility, both output and interest rates increase. By inspecting Eq. (14), the equilibrium money stock may rise or fall, depending on whether $L_yK_r + L_rZ_y$ are greater or less than zero. If $L_yK_r + L_rZ_y > 0$, the slope of the LM curve is greater than the slope of the BP curve (**Figure 3b**). In this case, $^{-L_y}/_{L_r} > {}^{Z_y}/_{K_r}$. The left side of inequality gives the slope of the LM curve, and the right side gives the slope of the BP curve. Economically, the equilibrium money stock rises as foreign exchange is accumulated by the monetary authority. However, if $L_yK_r + L_rZ_y < 0$, the slope of the BP curve is greater than the slope of the LM curve (**Figure 3c**). Monetary authority loses foreign exchange, LM shifts right, and equilibrium money stock declines.

2.2. Macroeconomics policy under the flexible exchange rate system

Flexible exchange rate is a system which allows the exchange rate to freely change within the market. These variations in the exchange rate demand/supply provide the equilibrium that pass through the nominal rate. Exchange rate changes that are part of the expenditure shift policies are used to provide the external balance in the exchange rate systems. Potential external surplus keeps decreasing the exchange rate, while potential external deficit gives a rise in the exchange rate. Both of them separately prevent a real external imbalance. Central Bank has no responsibility

on the exchange rate and BP under the flexible exchange rate system. If there is an imbalance in the exchange rate or BP, it recovers automatically.

Governments cannot control exchange rate, interest rate and capital movements at the same time using flexible exchange rates. This is known as the impossible trinity, asserted by [16]. Two of them are chosen as policy instruments, and the other is determined by market dynamics. Under the perfect capital mobility with a flexible exchange rate system, the two policy instruments (interest rate and capital movements) can be effectively controlled since exchange rate is determined by market dynamics. However, it is asserted that exchange rates are not allowed to be determined by interest rates in many countries using flexible exchange rate systems [17].

Setting "e" as exchange rate, the IS-LM-BP equation system with a flexible exchange rate can be written as follows:

$$I(r) = S(y) - G + Z(y,e) - X(e) \tag{21}$$

$$M_s = L(y,r) \tag{22}$$

$$X(e) - Z(y,e) + K(r) = 0 \tag{23}$$

When we differentiate the equations above according to the endogenous variables y, r and e:

$$\begin{pmatrix} S_y + Z_y & -I_r & Z_e - X_e \\ L_y & L_r & 0 \\ Z_y & -K_r & Z_e - X_e \end{pmatrix} \begin{bmatrix} dy \\ dr \\ de \end{bmatrix} = \begin{bmatrix} dG \\ dM_s \\ 0 \end{bmatrix} \tag{24}$$

Using $T = (Z_e - X_e)(L_r S_y - L_y K_r + I_r L_y) > 0$, the result of the matrix system for dy, dr and de is as follows:

$$\begin{bmatrix} dy \\ dr \\ de \end{bmatrix} = \begin{pmatrix} L_r(Z_e - X_e)/T & (I_r - K_r)(Z_e - X_e)/T & -L_r(Z_e - X_e)/T \\ -L_y(Z_e - X_e)/T & S_y(Z_e - X_e)/T & L_y(Z_e - X_e)/T \\ -(L_y K_r + L_r Z_y)/T & [K_r(S_y + Z_y) - K_r Z_y]/T & [-L_r(S_y + Z_y) + L_y I_r]/T \end{pmatrix} \begin{bmatrix} dG \\ dM_s \\ 0 \end{bmatrix} \tag{25}$$

2.2.1. Monetary policy

We obtain the following multipliers, which can be used for observing the monetary policy functions after mathematical manipulations, in Eq. (25):

$$\frac{dy}{dM_s} = \frac{I_r - K_r}{L_r S_y - L_y K_r + I_r L_y} > 0 \tag{26}$$

$$\frac{dr}{dM_s} = \frac{S_y}{L_r S_y - L_y K_r + I_r L_y} < 0 \tag{27}$$

$$\frac{de}{dM_s} = \frac{K_r S_y}{(Z_e - X_e)\left(L_r S_y - L_y K_r + I_r L_y\right)} > 0 \tag{28}$$

The multipliers are as follows, under perfect capital mobility (**Figure 4d**), $K_r \to \infty$:

$$\frac{dy}{dM_s} = \frac{1}{L_y} > 0 \tag{29}$$

$$\frac{dr}{dM_s} = 0 \tag{30}$$

$$\frac{de}{dM_s} = \frac{S_y}{-(Z_e - X_e)L_y} > 0 \tag{31}$$

There is no difference in the interest rate with a perfect capital mobility as shown in Eq. (30). When we observe **Figure 4d**, LM shifts to LM′ after an expansionary monetary policy. Hence, the domestic interest rate will be lower than the world interest rate, and the national currency will depreciate due to the capital outflow. As a response, exports will rise and imports will fall.

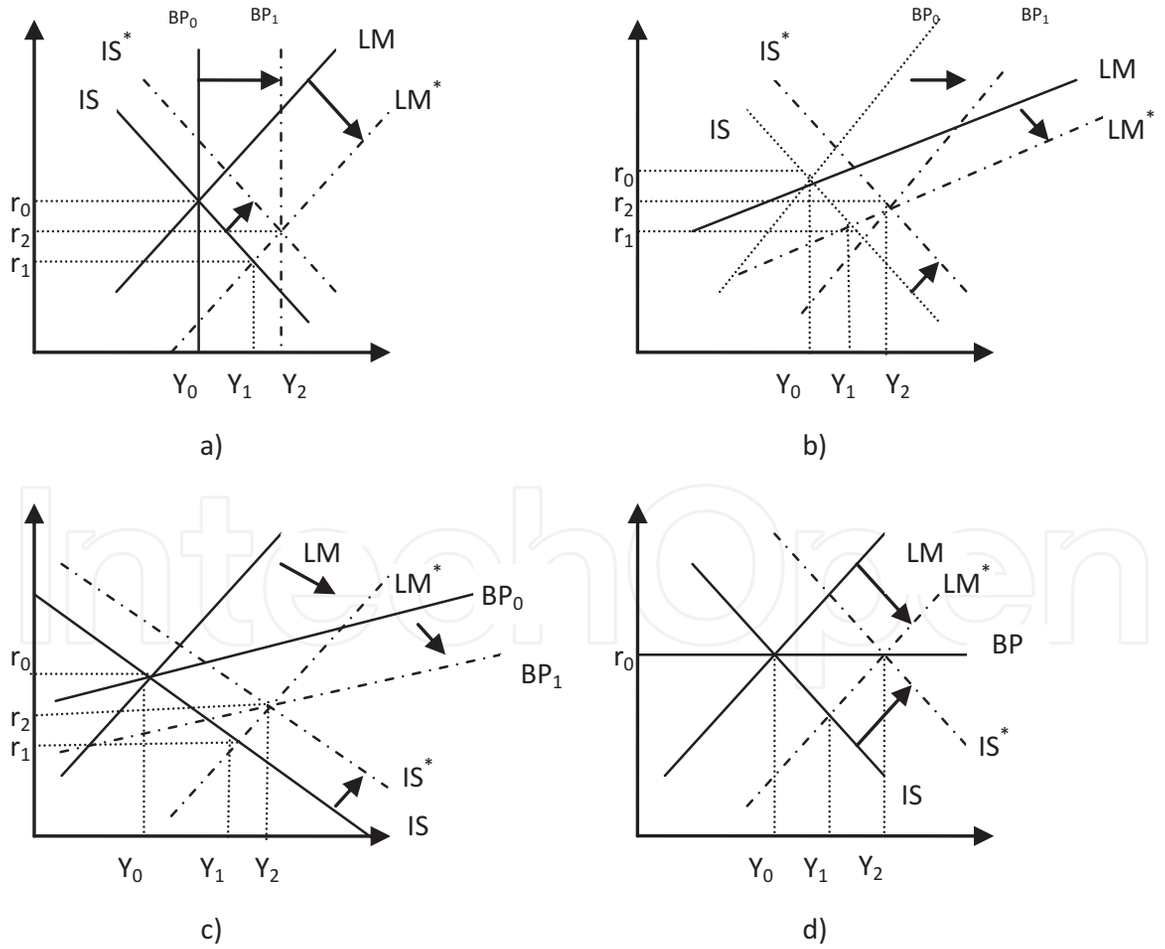

Figure 4. Monetary policy under flexible exchange rate. (a) Imperfect capital mobility, (b) low capital mobility, (c) high capital mobility and (d) perfect capital mobility.

This gives rise to an increase in the aggregate demand, and IS will shift to IS'. The last equilibrium point will be at Y_2. Finally, it is obviously and can be seen that monetary policy is really efficient under flexible exchange rate.

On the other hand, when $K_r \to 0$ with imperfect capital mobility, the multipliers for y, r and e will be as follows, respectively:

$$\frac{dy}{dM_s} = \frac{I_r}{L_r S_y + I_r L_y} > 0 \tag{32}$$

$$\frac{dr}{dM_s} = \frac{S_y}{L_r S_y + I_r L_y} < 0 \tag{33}$$

$$\frac{de}{dM_s} = 0 \tag{34}$$

IS-LM-BP curves move similarly in imperfect capital mobility, low capital mobility and high capital mobility (**Figure 4a–c**). As a result, income and interest rate efficiencies resemble each other for all cases in **Figure 4**.

2.2.2. Fiscal policy

Applying Cramer Rule on Eq. (25), the following multipliers are calculated to observe the fiscal policy functions:

$$\frac{dy}{dG} = \frac{L_r}{L_r S_y - L_y K_r + I_r L_y} > 0 \tag{35}$$

$$\frac{dr}{dG} = \frac{-L_y}{L_r S_y - L_y K_r + I_r L_y} > 0 \tag{36}$$

$$\frac{de}{dG} = \frac{-\left(L_y K_r + L_r Z_y\right)}{\left(Z_e - X_e\right)\left(L_r S_y - L_y K_r + I_r L_y\right)} >< 0 \tag{37}$$

The multipliers for y, r and e are as follows under perfect capital mobility (**Figure 5d**), $K_r \to \infty$:

$$\frac{dy}{dG} = 0 \tag{38}$$

$$\frac{dr}{dG} = 0 \tag{39}$$

$$\frac{de}{dG} = \frac{1}{\left(Z_e - X_e\right)} \leq 0 \tag{40}$$

According to Eqs. (38)–(40), the national currency depreciation is not possible since the capital account effect of fiscal policy is dominant. Because of this, fiscal policy is not efficient under flexible exchange rate. On the other hand, efficiency of fiscal policy may be observed from

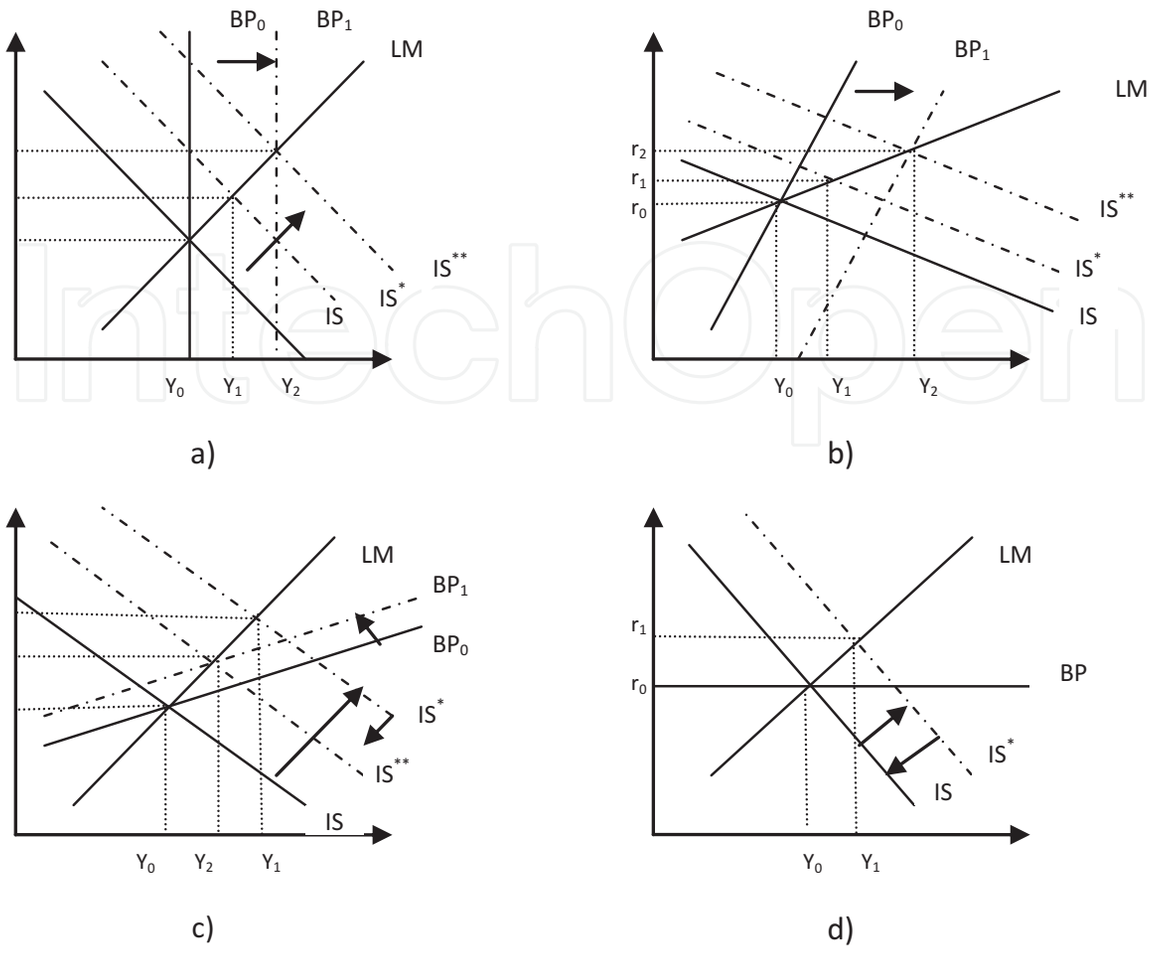

Figure 5. Fiscal policy under flexible exchange rate. (a) Imperfect capital mobility, (b) low capital mobility, (c) high capital mobilit and (d) perfect capital mobility.

different sights due to the degree of capital mobility. In this context, since the inequalities $L_yK_r > 0$ and $L_rZ_y < 0$, Eq. (37) may be positive or negative. As it is described before Z_y/K_r is the slope of the BP curve, and $-L_y/L_r$ is the slope of the LM curve. We get the following Eq. (41) since $L_yK_r + L_rZ_y > 0$:

$$Z_y/K_r < -L_y/L_r \tag{41}$$

It is obvious that the slope of the LM curve is larger than the slope of the BP curve. This indicates the low capital mobility case. The shifting of IS-LM-BP system is examined in **Figure 5b**. If $L_yK_r + L_rZ_y < 0$, the slope of the LM curve will be lower than the slope of the BP curve. Hence, high capital mobility case occurs. The movements of IS-LM-BP of this case are given in **Figure 5c**.

At last, the multipliers are as follows under imperfect capital mobility, i.e. $K_r = 0$:

$$\frac{dy}{dG} = \frac{L_r}{L_rS_y + I_rL_y} > 0 \tag{42}$$

$$\frac{dr}{dG} = \frac{-L_y}{L_r S_y + I_r L_y} > 0 \tag{43}$$

$$\frac{de}{dG} = \frac{-L_r Z_y}{(Z_e - X_e)\left(L_r S_y + I_r L_y\right)} > 0 \tag{44}$$

According to the three multipliers Eqs. (42)–(44), fiscal policy affects only current account so national currency depreciates, i.e. exchange rate rises.

2.3. Effects on firms

Firms are influenced by exchange rate changes due to the effects they have on the general economy and also because of the activities they carry out in foreign currency. Fluctuations in exchange rates affect firms either positively or negatively, which is defined as exposure to exchange rate or exchange rate risk in financial literature. The exchange rate sensitivity is the potential for changes in exchange rates, company cash flows and hence the market value. Exchange risk is not an issue if the change in the cash flows of a firm that is exposed to this exchange rate effects can be predicted in advance. In short, if there is no difference between expected cash flows and realized cash flows due to exchange rate changes, exchange rate risk is not a concern. Openness to exchange rate, in general, becomes clear in three ways: accounting, economic and transaction effects. The accounting effect, also called the translation exposure, is an effect that occurs when the financial statements of the subsidiary are converted into the central currency of the country during the consolidation of the financial statements, and it is the measurement of the change that this effect causes on the firm's equity. The main way of protecting from accounting effect is to increase liabilities by reducing assets from weaker currencies and reducing liabilities by holding assets from stronger (revalued) currencies. A position in the derivative markets can be taken to support this approach. The economic impact, defined as the effect of unexpected changes in the exchange rate on the future cash flows of firms, is important as much as the degree it affects company value. However, since future cash flows are not easy to predict, many researchers describe the effects of exchange rate changes on the firm value, which is assumed to be the present value of future cash flows, as an economic impact. Since the effects of exchange rate changes on the economic side are long term, the hedging methods in derivative currencies lose their validity in decreasing the economic effect; instead, firms can develop their own strategies and avoid the risks of economic vulnerability. The transaction effect is the effect of exchange rate changes on the sales and profitability plans together with the foreign currency denominated receivables and payables of firms. In order to be able to determine the presence of the transaction effect, the estimation of the net cash flows in foreign currency, and its potential effect should be measured. Since they are mostly short lived, it is possible to solve the problem with the help of derivatives (forward, future, option contracts) and money (hedge transactions) markets. Due to the growth strategy that Turkey has embraced, exporting companies have a critical prescription in the economic structure. For this reason, it is important for policymakers to determine the effect of the exchange rate variability on firms' performance. The effects of changes in exchange rates on firms can be listed as follows [23, 24]:

- Uncertainty: Since the exchange rate at the date of the commercial agreement differs from the exchange rate at the date of payment, there is uncertainty about the future profits of economic agents operating in foreign trade. As a result, foreign trade volume decreases. However, it is also argued that the degree of avoidance of risk plays an important role in determining the effects of exchange rate uncertainty on exports. For an exporter who does not like risk, for example, an increase in exchange rate variability would increase the marginal benefit of expected export revenue. This is because the exporter would prefer to do more production in order to avoid the decrease in export revenues.
- Effect on foreign trade: Rise in the real exchange rate is called real depreciation. The relative price (e/P) increases in the case of real depreciation, so that the goods produced domestically are cheaper than the goods produced abroad, whereas the goods produced abroad are more expensive than the goods produced domestically. As a result, the sales of firms abroad and total sales increase. On the other hand, the real value gain has the opposite effect. The magnitude of the effect of real depreciation and real value gain on firms' performance depends on the demand elasticities of export and import goods.
- Impact on investment decisions: In the event that the managers of the firms dealing with international trade are unable to make accurate predictions as to whether the exchange rate changes are permanent or temporary, investment decisions are postponed.
- Competitive impact: Changes in exchange rates can affect the competitiveness of companies in the face of their competitors. The effect of exchange rate changes on the competitiveness, and hence cash flows of companies according to their qualifications can be positive or negative. In addition, the change in the exchange rate affects the competitiveness of firms by changing the input prices used by firms.
- Economic impact: This refers to the effect of exchange rate changes on the income, expense or accumulated deficit or receivable of the company. In other words, the economic impact is the effect of exchange rate changes on the company's future cash flows. Exchange rate changes affect the value of the company by changing the current real value of the income streams [23, 24].

3. Conclusions

We can summarize the fiscal and monetary policies under fixed and flexible exchange rate with different types of capital movements as can be seen in **Table 1** [4]. We see that fiscal policy is efficient under fixed exchange rate regime with perfect capital mobility. In addition monetary policy is efficient under flexible exchange rate regime with perfect capital mobility.

By the early 1960s, macroeconomics had become firmly established as an approach to open economy questions. The standard analysis was one of the comparative statics in a model with income demand determined and with the exchange rate setting relative prices. The following years brought the highly influential work of Robert Mundell, who created models under fixed and flexible exchange rates [8, 21, 22].

Policy	Zero mobility	Low capital mobility	High capital mobility	Perfect mobility
Fixed exchange rate regime				
Expansionary monetary policy	0	0	0	0
Expansionary fiscal policy	0	Multipliers increases as the degree of capital mobility increases		$\frac{1}{S_y+Z_y}$
Flexible exchange rate regime				
Expansionary monetary policy	$\frac{I_r}{L_r S_y + I_r L_y}$	Multipliers increases as the degree of capital mobility increases		$\frac{1}{L_y}$
Expansionary fiscal policy	$\frac{L_r}{L_r S_y + I_r L_y}$	Multipliers decreases as the degree of capital mobility increases		0

Table 1. The effects of monetary and fiscal policies under various exchange rate regimes.

Toward the early 1970s, the field opened up in many directions. The formal orientation had led to interest in empirical work, and soon questions of capital mobility, or trade and payment adjustment, become popular areas of applied research.

There was a perception, almost up to the late 1980s, that the emerging countries were not different from the developed ones except for levels of per capita. The developed country represented to the developing country a mirror image of its future [15]. However, it is not like that. There are completely different problems in emerging countries because of the differences in social life, geography, that is, the location of the country and political problems. Emerging countries' lack of structural reforms and shallow financial markets curb economic growth. To overcome this obstacle, emerging countries must give priority to the reforms and financial markets.

The early 1990s have witnessed a large increase in capital inflows to emerging countries. These flows are characterized according to their magnitude, timing, regional and country destination, asset composition and sectoral destination. This chapter examines the nature of the capital inflows in a theoretical way. There may be various responses undertaken by the recipient countries against capital inflows. Capital inflows result in huge expansion of aggregate demand resulting in an increase in domestic inflation and an appreciation of the real exchange rate. Specifically, with a predetermined exchange rate, capital inflows generate an overall balance of payment surplus. This may cause appreciation of the nominal exchange rate. The Central Bank has to intervene in the foreign exchange market to buy the excess supply of foreign currency at the current rate to avoid an appreciation of the nominal exchange rate. Thus, monetary base expands. Base expansion would lead to growth in broader monetary aggregates, which results in an expansion of aggregate demand. This would increase domestic price level. Rising domestic prices with fixed nominal exchange rate would imply an appreciation of the real exchange rate. Policymakers can break this chain trough a policy intervention. These interventions are as follows [23]:

There exist policies, which:

- Limit the net capital inflow. This can be done in two ways: firstly, by limiting gross capital inflow and secondly by allowing more gross capital outflow. Inflow of capital usually

faces administrative controls, whereas there is a reduction in limitations on the outflow of capital. Exchange rate bands can also be widened to increase the uncertainty.

- Limit the inflow of net foreign exchange. This can be done through an offset of the current account to achieve a surplus in the capital account. This effect can be seen in the trade liberalization and the nominal exchange rate appreciation.
- Accept the accumulation of reserve that has a relation with a balance of payment surplus. However, these policies try to correct this effect on the monetary base.
- Accept a base increase, but at the same time, try to limit its effect on the broader monetary aggregates. Examples include increase in the reserve requirements and quantitative credit restrictions.
- Accept monetary expansion; however, try to overcome their effects on aggregate demand as it can lead to inflation as well as appreciation in the real exchange rate.

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