A Brief Discussion of the Effectiveness of Monetary Policy in a Fixed Exchange Rate System With Perfect Capital Mobility and an Analysis of the "Impossible Trinity" Thesis

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Introduction

The purpose of this essay is to discuss the effectiveness of monetary policy in a fixed exchange rate system with perfect capital mobility and an analysis of the Impossible Trinity thesis, with the IS-LM-BP framework.

Section 1 analyses the implications of capital mobility. Section 2 explains the IS-LM model framework. Section 3 analyse the balance of payments. Section 4 discusses the relationship between the balance of payments and the monetary accounts. Section 5 discusses the implications of monetary policy with perfect capital mobility. Section 6 discusses the monetary policy effectiveness and conclusions.

The Implications of Capital Mobility

First, it is important to analyse the implications that capital mobility has for the operation of macroeconomic policy. As Caves, Franklen and Jones (2002) states that international capital flows depend primarily on the rates of return of the assets that are offered by various countries. Thus, the differential between the domestic and foreign interest rate is the determinant of capital outflow or inflow for any investor.

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The equation for the capital account balance is represent as follows,

$$KA = KA + k(i-i^*)$$

As many, the domestic interest rate, *i,* rises above the foreign rate, *i**, foreign investors will be willing to acquire assets from the foreign country that pays a higher interest rate. The capital inflow in the foreign country will represent a surplus in its capital account having a positive KA. On the contrary, the capital outflow in the domestic country will represent a deficit in its capital account because his residents will be willing to buy foreign assets. In this case KA is negative. As *K* goes to infinity this implies a perfect capital mobility. There is also an exogenous component KA.

The IS-LM Model

Second, we will analyse the relationship of the IS-LM line as follows:

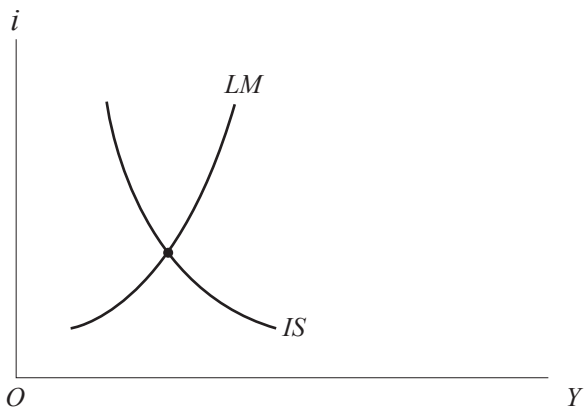
$$IS: Y = [A - b(i) + X - M]/(s + m)$$

$$LM: M/P = L(i,Y)$$

The IS curve is the relationship between output, *Y,* and the interest rate, *i,* that gives equilibrium in the goods market. Government expenditure, *G,* is subsumed in the intercept term for the equation. *A* is an exogenous component of spending. The Keynesian multiplier is 1/(s + m).

The LM curve is the relationship between income, *Y,* and the interest rate, *i,* that maintains equilibrium in the money market. The equilibrium is defined as real money supply (M/P) equal to real money demand.

Figure 1. IS-LM relationship



The Balance of Payments

Third, the balance of payments is represent in equilibrium through the BP line. The BP relationship includes the trade balance, TB, and the capital account, KA, that depends positively on the interest differential (i – i*). The equation is as follows;

$$BP = TB + KA = 0$$

$$BP = X - M - mY + KA + k\,(i - i^*) = 0$$

The second equation shows the overall balance of payments equal to zero represented by combinations of income and the interest rate.

We can solve the equation to show the level of the interest differential that corresponds at any given level of income, *Y:*

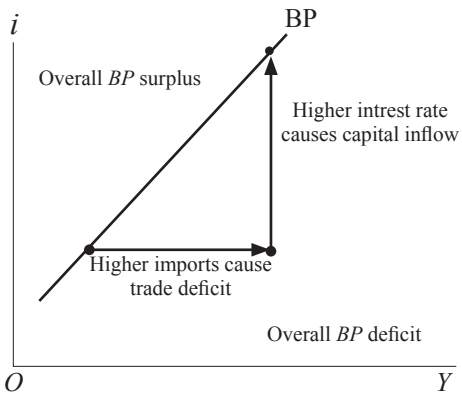
$$I - i^* = -(1/k)(X - M + KA) + (m/k)\,Y$$

The slope of the BP curve is *m*/*k*. Where, *k* is the capital mobility, and *m* the marginal propensity to import. The larger *k,* the slope goes to zero.

It is also assumed that the home country is relatively small in international financial markets. Hence, it can take the rest of the world's interest rate as given ($i^* = i^*$) *I assume you mean i = i*.*

In the following figure, we can observe that the BP schedule appears on the same axes as IS-LM.

Figure 2. Balance of Payments Equilibrium



Source: Carven, Frankel and Jones (2002).

The Relationship of the Balance of Payments and the Monetary Accounts

Now I will show the relationship between the balance of payments and the monetary accounts since it has an important effect on the development of the balance of payments itself. The central bank's operations in the foreign exchange market are depicted in the central bank's balance sheet identity as follows:

$$NFA + DC = H$$

The left side represents the assets held by the central bank. Where, NFA represents net foreign reserves and DC the domestic credit extend by the central bank to government and commercial banks. The right side shows the liabilities represented by monetary base or high powered money *H,* which is the currency in circulation and deposits held by commercial banks.

As the foreign exchange markets are influenced by the demand and supply of foreign exchange. Under floating exchange rate regime the demand and supply of foreign exchange is eliminated through price adjustments. However, pure floating is a rare phenomenon. On the contrary, under a fixed exchange rate regime the central bank would intervene in the foreign exchange market to meet excess demand or supply of foreign exchange.

This has implications for domestic money supply Ms, since the money supply is linked to high powered money through the money multiplier μ. In other form, Ms = μH. However, the automatic adjustment process in the monetary approach could be frustrated by the policy of sterilisation.

The sterilisation process implies that the monetary authority may wish to compensate the movements in the money supply by movements in the net foreign assets or in the domestic credit. This relationship can be stated as follows:

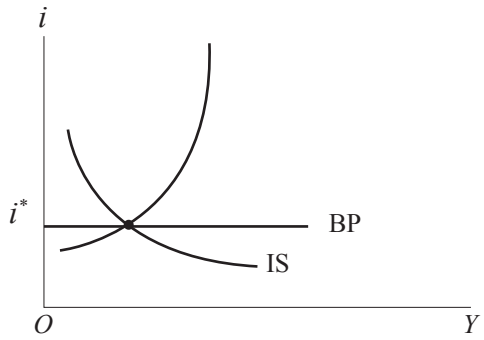
$$\Delta NFA + \Delta\, DC \equiv \Delta\, H$$

i.e. ΔNFA is matched by a precisely opposite sign in DC so that $\Delta H = 0$.

The Monetary Policy Under Perfect Capital Mobility

In this section we turn to the implications of monetary policy. The starting point is the assumption that the economy is in equilibrium at the intersection of the IS and LM curves, where the balance of payments equals to zero. This can be observed in the following figure:

Figure 3. The economy in equilibrium



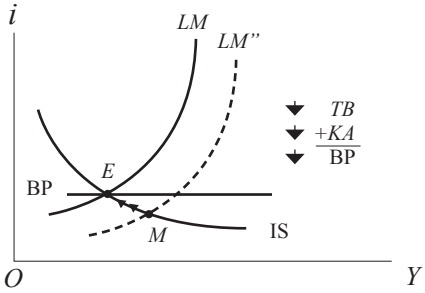
Source: Caves, Franklen and Jones (2002).

Hence, as the IS or LM curves shift, the overall equilibrium will have an automatic adjust. Here it is assumed that a perfect capital mobility exists.

Fixed Exchange Rates

Under a fixed exchange rate, a monetary expansion increases the income and decreases the interest rate, as capital mobility outflow increases. Hence, the central bank loses reserves under the pressure of either to abandon the fixed exchange rate or to increase the interest rate.

Figure 4. Perfect capital mobility under fixed exchange rates



Source: Caves, Franklen and Jones (2002).

In the graph shown above we can observe that under a fixed interest rate, if the domestic interest rate is smaller than the foreign interest rate, there will be an increase in capital outflow because investors will be willing to invest in the foreign market. Then investors' behaviour will cause an increase in foreign exchange demand. Conse-

quently, the central bank will be losing international reserves and therefore will have a decrease in the money supply, i.e. sterilisation is not possible in the long run.

I can state the monetary expansion under fixed exchange rate shown above in another form, such as:

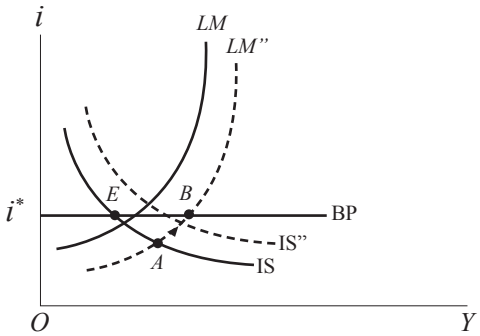
$$I < i^* \rightarrow \Delta^{-}\kappa \rightarrow \Delta D_{NFA} \rightarrow \downarrow NFA \rightarrow \downarrow H$$

From the analysis we can argue that under fixed exchange rates and perfect capital mobility, monetary policy is ineffective, i.e. an independent monetary policy is not possible.

Floating Exchange Rates

Under a floating exchange rate, the central bank will recapture its monetary independence as shown below.

Figure 5. Perfect capital mobility under floating exchange rates



Source: Caves, Franklen and Jones (2002).

In Figure 6 above, it is shown that if the domestic interest rate is smaller than the foreign interest rate, there will be an increase in capital outflow, causing an increase in foreign exchange demand. Thus, the exchange rate will decrease, stimulating net exports and decreasing the imports. The shift of the income will continue until the economy adjusts to the original interest rate.

I can state the monetary expansion under floating exchange rate shown above in Figure 6, in another form, such as:

$$I < i^* \rightarrow \Delta^{-}\kappa \rightarrow \Delta D_{NFA} \rightarrow \downarrow Er \rightarrow \uparrow X \downarrow M$$

Thus we can state that under floating exchange rates and perfect capital mobility the monetary policy is efficient.

Monetary Policy Effectiveness. Conclusions

This essay concentrates mostly on the effects of the monetary policy under a floating and a fixed exchange rate with perfect capital mobility, but a fuller treatment would need to include the implications of fiscal policy as well, since there is net symmetry mobility in the results. As Caves, Frankel and Jones (2002: 496) pointed out that:

> Under fixed exchange rates, fiscal policy reaches its peak effectiveness and monetary policy becomes completely powerless. Under floating exchange rates, by contrast, fiscal policy loses all power and it is monetary policy that reaches its peak effectiveness.

Hence, according to the model, monetary policy can only be effective under a floating exchange rate, in order to maintain the independence of the central bank. However, there are important aspects that have to be stressed. For example, as Caves, Franklen and Jones (2002) point out, the interest rates are in fact observed to differ across countries. Hence, it is hard to believe that a monetary expansion under floating rates has none of its effect via domestic demand.

Also, when introducing expectations the interest rate can lie below the world interest rate despite perfect capital mobility. What is more, when higher output had to bear the entire burden of higher money demand, it doesn't mean that the exchange rate doesn't have to move quite as far as was previously thought.

Further, the Impossible Trinity thesis states that between the fixed exchange rates, financial openness and monetary independence, a country can choose to have any two attributes, but it cannot choose all three.

For example, the process of creation of the European Monetary System faced a combination of fixed exchange rates and financial integration. Thus, in order to have a positive effect of the monetary policy, it was necessary that all the countries members were prepared for the loss of their monetary independence, and doing so the plan for exchange rate fixity with financial integration will be successful. It was until 1999 that the European Monetary Union plan succeeds and the exchange rates among the members are now irrevocably fixed.

Bibliography

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