

INTER – RELATION BETWEEN FII, INFLATION AND EXCHANGE RATE

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ABSTRACT:

The Financial Sector of an economy plays a significant role in attracting the Foreign Institutional Investment inflows. The present study tries to examine the effect of significant macroeconomic variables; inflation and exchange rate on the inflows of Foreign Institutional Investment in India. The author has tried to develop a theoretical framework to analyze the inter-relation between Foreign Institutional Investment, Inflation and Exchange Rate. Given the huge volume of these flows and their significant impact on domestic financial markets; understanding the determinants of these flows becomes imperative as the economy moves towards full capital account convertibility.

1. INTRODUCTION

1.1 Pre-Liberalization Era:

India, after independence, opted for a model of development characterized by what was then perceived as self-reliance. This meant that, until the 'eighties';

- financing of investments was almost wholly through domestic saving with recourse to foreign flows at the margin only;
- reluctance to permit foreign investments or private commercial flows in general;
- almost total reliance on official, especially multilateral flows, mainly on concessional terms;
- recourse to IMF facilities to meet extraordinary situations such as the drought in 1960s, oil shock of late 1970s, an Extended Fund Facility (EFF) in the 1980s and more recently, in the early 1990s, the Gulf crisis; and
- Relatively greater emphasis on import-substitution rather than export-promotion.

In brief, till 1980s, external financing was confined to external assistance through multilateral and bilateral sources, mostly on concessional terms to or through Government. The Private sources of finance were looked at with suspicion. Until 1991, India relied more on bilateral and multilateral loan agreements with long maturities, and relatively lesser on equity inflows in the form of FDI and portfolio investments. FDI inflows were allowed only in designated industries with varying conditionality imposed upon them. In the 'eighties, global developments, particularly the perceptible decline in the availability of official concessional flows in relation to the external financing needs of developing countries, changed the external sector situation at a time when India was initiating liberalization. The compulsions of repayments to IMF during the late 'eighties (of the EFF draws in the early 'eighties) added to the problems. Hence, recourse to external debt on commercial terms became inevitable. In addition to institutional sources (such as Export-Import agencies), syndicated loans and bonds, and deposits from non-resident Indians were accessed. The justification for this approach was to sustain the momentum of growth of the Indian economy which jumped from around 3 per cent per annum during 1950-80 to over 5 per cent in the 'eighties, and to maintain the impressive export performance of the late 'eighties. In the late eighties in response to partial liberalization measures, economic growth increased to 8% of GDP. To sustain high growth momentum the Government followed expansionary policies resulting in high fiscal deficit and high Current Account Deficit. In the absence of exchange rate flexibility these problems became acute thus resulting in the Balance of Payments crisis.

2. POST-LIBERALIZATION ERA:

After globalization comprehensive economic reforms were introduced in various sectors such as:

- Fiscal Policy Reforms: State tax regime with just 3 rates for both excise as well as Customs Duties. Along with the Full National Treatment for Foreign Companies incorporate in India.
- Industrial Policy Reforms: Capacity licensing was dispensed with and compulsory licensing was restricted only to 6 sectors and this categorization was based on the grounds of national security, public health and public safety.
- Trade Policy Reforms: Most of the items were on open General License and the Quantitative Restrictions were lifted.
- Monetary Policy and Financial Sector Reforms:
 1. Interest Rates Brought Down – Bank Rate and PLR were lowered. Prudential norms were stiffened in Banking Sector which led to various reforms in the Banking Sector.
 2. Securitization Act was introduced for providing better security to the creditors.
 3. Independent regulators were formed in place for Insurance Sector and the Capital Markets, IRA and SEBI was introduced respectively.

4. More emphasis was laid down on Equity Flows in place of Debt Flows. This was done in the form of FDI and Portfolio Investments.
 - Relaxation in Exchange Controls: Profits and dividends were freely repatriated.

Globalization and financial sector reforms in India have ushered in a sea change in the financial architecture of the economy. With the inception of Financial Sector Reforms, since 1997, there has been a dramatic change in the functioning of the financial sector of the economy. Ever since the opening of the Indian equity markets to foreigners, FII investments have steadily grown from about Rs. 2,600 Cr in 1993 to about Rs. 21,000 Cr till October 2003. The resultant gain of this injection has led to both the positive and negative results. On the positive side it is the opening of new opportunities with the integration of domestic and financial markets and its negative side shows the risk factor which is being faced by the financial system. Consequently, it is important to understand the mutual relationship between the financial markets from the standpoint of financial stability. FII investment in the domestic market has both the positive and negative effects. On its positive side stands the argument that it helps in achieving a higher degree of liquidity at domestic stock market; it increases price earning ratios and finally reduces the cost of capital for investment. Along with this they also help in improving the functioning of the domestic stock market. On its negative side stands the argument that they may pull back their investments at any time they find that there is a trouble in the economy of the Host Country. Large capital flows could push up monetary aggregates, create inflationary pressures, destabilize exchange rate, affect domestic financial sector, and finally disrupt the economy if and when such flows get reversed or drastically reduced. The experience so far has, therefore, brought to the fore the issue of managing such flows specifically, how to maximize the benefits of such flows, and minimize costs of such flows, including the cost of risk of reversal of such flows. However, if we look at the negative side of the FII inflows then we can conclude that the negative side is heavier than the positive side as it may prove to be a breakdown for the whole of the economy and thus leading to a crisis. Asian Crisis is an example of the same.

In order to know the health of an economy and to know the level of exposure in International Market one can look into the Stock Markets and the Foreign Exchange of that country. Thus, the stock markets and the Foreign Exchange play a vital role to know the Financial Pulse of a country.

In this paper an attempt has been made to look into the macro-economic determinants of the FII, i.e. Interest Rate, Inflation and Exchange Rate and to find out an inter-relationship between Interest Rate, Inflation, the Exchange Rate and FII. This relationship will be explained with the help of Uncovered Interest Parity Theory and the Purchasing Power Parity Theory.

The analysis concludes that return on the BSE Sensex affects return on exchange rate (Rs./US\$). Which would ultimately affects the inflation and the return on investment. Further, Net Investments by FIIs affects return on the BSE Sensex and interest rate. Interest rate affects the return on exchange rate. Growth of Demand for Money affects Net FII Investments.

3. FII:

“Foreign Institutional Investor” means an institution established or incorporated outside India which proposes to make investment in India in securities.¹

3.1 Theoretical Model for FII:

To build the theoretical model, well-known Uncovered Interest Parity (UIP) and Purchasing Power Parity (PPP) conditions have been combined. When there is both perfect capital mobility and equal riskiness of

¹ Regulation 2 (f) of Securities and Exchange Board of India (Foreign Institutional Investors) Regulations, 1995

domestic and foreign bonds, then home and foreign bonds are said to be perfect substitutes. Perfect substitutability of domestic and foreign bonds implies that uncovered interest parity condition will hold on a continuous basis.

3.2 Uncovered Interest Parity Theory:

Participants of the Foreign Exchange Market base their demands for deposits of different currencies on a comparison of these assets' expected rates of return. In order to compare the returns on different deposits the investor requires the following two-fold information:

- How the change in money value of deposits will take effect: This information is needed to compute the rate of return on a deposit of a particular currency. This is the currency's interest rate, i.e. the amount of that currency an individual can earn by lending a unit of the currency for a year. Eg: At a rupee interest rate of 10%, the lender of Re. 1 will receive Rs. 1.10 at the end of the year. Re. 1 of principal amount and Ps. 10 of which is interest.
- How the exchange rate will change so that they can translate rates of return measured in different currencies into comparable terms.

The interest rates offered by a Dollar and a Rupee will tell us how their Dollar and Rupee values will change over a year. The other piece of information we need to compare the rates of return offered by Dollar and Rupee is the expected change in the Dollar/Rupee exchange rate over the year. Thus, one is calculating the Rupee rate of return on a dollar deposit because you are comparing its (dollar's) rupee price today with its rupee price a year from today.

In order to find out that which deposit (Indian or US) will fetch you more benefit, one can make use of the following five steps process:

Step 1: Use today's \$/Re exchange rate to figure out the Dollar price of a Rupee deposit.

Step 2: Find out the amount of rupee you will have a year from now if you purchase rupee today. This can be done by taking the rupee interest rate into consideration.

Step 3: Use the exchange rate you expect to prevail a year from today to calculate the expected the dollar value of the rupee amount determined in Step 2.

Step 4: Calculate the expected dollar rate of return on a rupee deposit.

The above four step process can be easily understood with the help of the following example. Suppose that today's exchange rate is Rs. 45 per dollar, but you expect the rate of return to be Rs. 42 per dollar after a year. Suppose the rate of return on a dollar deposit is 10% per year while the rate of return on a rupee deposit is 5%. Keeping these figures in mind we will proceed to know the direction of investment inflows based on exchange rate differential and rate of return differential.

Step 1: If the exchange rate today is \$1/45 per rupee, the dollar price of Re 1 deposit is $\$ \frac{1}{45}$.

Step 2: Interest rate on rupee deposits is 5% per year. So at the end of the year, Re 1 deposit will be worth Re 1.05

Step 3: Since we expect the rupee to appreciate against the dollar over the coming year, then one would expect the dollar value of rupee deposit after a year would be $\$ \frac{1}{42} * \text{Re } 1.05 = \$ 0.025$

Step 4: Now we know the rupee price of a \$1 deposit today (Rs. 45) and can forecast its value in a year (\$0.025), thus the expected rupee rate of return on a dollar deposit as $(0.025 - 1/45) / (1/45) = 0.125$, i.e. 12.5%.

Thus we can conclude that since the rate of return on a dollar deposits is only 10% per year, one expects to do better by holding the wealth in the form of rupee deposits. Despite the fact that the dollar interest rate exceeds the rupee interest rate by 5% per year, the rupee's expected appreciation against the dollar gives rupee holders a prospective capital gain that is large enough to make rupee deposits the higher-yield asset.

The rate of return on a rupee deposit expressed in dollar terms can be expressed in terms of the following equation:

$$R_{Re} + (E'_{\$/Re} - E_{\$/Re})/E_{\$/Re}; \text{----- Equation 1}$$

Where; R_{Re} - Today's interest rate on one-year rupee deposits.

$E_{\$/Re}$ - Today's \$/Re exchange rate (number of rupees per dollar)

$E'_{\$/Re}$ - Dollar/Re exchange rate (number of dollar per rupee) expected to prevail a year from today.

The foreign exchange market is in equilibrium when deposits of all currencies offer the same expected rate of return. The condition that the expected returns on deposits of any two currencies are equal when measured in the same currency is called the **Interest Parity Condition**. Only when all expected rates of return are equal there is no excess supply of some type of deposit and no excess demand for another. The foreign exchange market is in equilibrium when no type of deposit is in excess demand or excess supply. Thus, we can say that the foreign exchange market is in equilibrium when the interest parity condition holds good. In equation form the equilibrium condition holds good when:

$$R_{\$} = R_{Re} + (E'_{\$/Re} - E_{\$/Re})/E_{\$/Re} \text{----- Equation 2}$$

Another significant determinant of foreign investment inflows is the inflation rate prevailing in the domestic and foreign country. The relationship between inflation and inflow of investment can be analyzed with the help of the provisions of Purchasing Power Parity Theory.

3.3 Purchasing Power Parity Theory (PPP):

The theory of the purchasing power parity states that the exchange rate between two countries' currencies equals the ratio of the countries' price level. The PPP Theory therefore predicts that a fall in a currency's domestic purchasing power (as indicated by an increase in the domestic price level) will be associated with proportional currency depreciation in the foreign exchange market. Similarly, PPP predicts that an increase in the currency's domestic purchasing power will be associated with a proportional currency appreciation. Putting it in equation form:

$$E_{\$/Re} = P_{\$}/P_{Re}; \text{----- Equation 3}$$

$$\text{Alternatively, } P_{\$} = E_{\$/Re} * P_{Re} \text{----- Equation 3 A}$$

The numerator on the right hand side is the dollar price of the reference commodity basket in the United States; the denominators shows the rupee price of the reference basket.

In the same fashion, the right side of the second equation measures the purchasing power of a dollar when exchanged for Rupee and spent in India. PPP therefore holds when, at going exchange rates, every currency's domestic purchasing power is always the same as its foreign purchasing power.

While the real exchange rate between two countries' currencies is a broad summary measure of the price of one country's goods and services relative to the other's. Major prediction of PPP is that real exchange rates

never changes, at least not permanently. Thus, the real exchange rate is a relative price of two output baskets while the nominal exchange rate (the earlier case) is the relative price of two currencies. Thus, the real dollar/rupee exchange rate, denoted $q_{\$/Re}$, as the dollar price of the Indian basket relative to that of the American.

$$Q_{\$/Re} = (E_{\$/Re} * P_{Re}) / P_{\$} \text{----- Equation 4}$$

The above equation shows the change in real dollar/rupee exchange rate to be a fall in the purchasing power of a dollar within Indian borders relative to its purchasing power within US. This change in relative purchasing power occurs because the dollar price of Indian goods ($E_{\$/Re} * P_{Re}$) rise relative to those of US goods ($P_{\$}$).

3.4 Absolute PPP and Relative PPP:

The equation $E_{\$/Re} = P_{\$} / P_{Re}$ (exchange rates equal relative price levels) is sometimes referred to the absolute PPP. Absolute PPP implies a proposition known as relative PPP which states that the percentage change in the exchange rate between two currencies over any period equals the difference between the percentage changes in national price levels. Relative PPP thus translates absolute PPP from a statement about price and exchange rate levels into one about price and exchange rate changes. It asserts that prices and exchange rates change in a way that preserves the ratio of each currency's domestic and foreign purchasing powers.

Thus, relative PPP between US and India would be written as:

$$(E'_{\$/Re} - E_{\$/Re}) / E_{\$/Re} = \pi_{US} - \pi_{Re} \text{----- Equation 5 (Kulwant Rai & N R Bhanumurthy, Determinants of Foreign Institutional Investments in India: Role of Return, Risk and Inflation)}$$

Now we'll combine the effects of UIP Theory and the PPP Theory. This combination will give the following results:

$$Q_{\$/Re} = (E_{\$/Re} * P_{Re}) / P_{\$}; \text{ therefore}$$

$$E_{\$/Re} = (Q_{\$/Re} * P_{\$}) / P_{Re}. \text{ This equation is in the absolute terms.}$$

If we look into the relative terms of the PPP then the following equation can be looked into:

$$(E'_{\$/Re} - E_{\$/Re}) / E_{\$/Re} = \pi_{US} - \pi_{Re}$$

Replacing the value of $(E'_{\$/Re} - E_{\$/Re}) / E_{\$/Re}$ to $\pi_{US} - \pi_{Re}$ in equation number 2 then the following result will emerge:

$$R_{\$} = R_{Re} + \pi_{US} - \pi_{Re}$$

This can be re-written as:

$$i_d = i_f + \pi_{Re} - \pi_{U.S.}$$

This equation leads to the following conclusions:

- Typical investor can be assumed to consume foreign goods, hence s/he may derive benefits from FII in that s/he can hedge her internationalized consumption basket against foreign exchange risk through the investment in foreign assets.

- Consumer-investor who consumes purely domestic goods and has no FII is exposed to unexpected change in the domestic inflation, but not to foreign inflation risk or foreign exchange rate risk. In case consumer investor has made some FII, but consumes purely domestic goods, they face both domestic inflation and exchange risk, because the investor's wealth is now affected by unexpected changes in the exchange rate. However, this exchange rate risk is directly translated into inflation risk when PPP holds.
- If consumer-investor consume some imported goods but have no foreign securities in their portfolio, they face domestic inflation, foreign inflation and exchange rate risk. However, if PPP holds exactly over the investment horizon, then the combination of foreign inflation and exchange rate change will always be equal to the domestic inflation rate. Thus, consumer investors only face the domestic inflation risk. In these examples, whenever, PPP holds, exchange risk is not a barrier to FII.
- Finally, in case consumer-investors have some foreign assets in their portfolios and also consume foreign goods, they face domestic inflation, foreign inflation and exchange rate risk, because the consumption pattern includes some imported goods. The exchange rate risk, however, can be hedged through appropriate foreign investment. Therefore, exchange risk on the consumption side could serve as an incentive for FII. Again, when PPP holds, the exchange risk is the same as the inflation risk and, thus, there is no incentive for FII. Nevertheless, if consumer-investor consume some imported goods and have (proportionately matching) FII they are able to hedge the exchange rate risk. Therefore, regardless of whether PPP holds, they may be able to avoid exchange rate risk.
- Considering investor has some foreign goods in his consumption basket hence he would take into account the inflation in foreign market. FII would be influenced by equation 1, when there is equality between right hand side (RHS) and left hand side (LHS) there would be no FII. However, if RHS is greater than LHS then, FII would flow out of domestic country until equality is restored. Similarly, when LHS is greater than RHS, FII would flow into the domestic country until equality is restored. Hence, if there is in domestic inflation (π), so that RHS more than LHS, then FII would flow out of domestic country, on the other hand if inflation in foreign country increases (i.e. LHS is greater than RHS) FII would flow into the domestic country.

Thus, in other words, when domestic inflation rate increases the purchasing power of the funds invested decreases hence the investor is discouraged to invest in the country, similarly, when inflation rate in foreign country rises, the purchasing power of the investment in that country decreases hence investor has disincentive to invest in that country.

4. APPLICATION and ANALYSIS IN TERMS OF CONTEMPORARY DEVELOPMENTS

The theoretical underpinnings discussed above can be analyzed in an effective manner in terms of the current developments affecting the Indian Economy. In the current scenario two events which have caught the attention of economists, policy makers, scholars alike are the revaluation of the Chinese currency and the oil price hike.

4.1 Yuan Revaluation:

China was following a policy of pegged exchange rate wherein the Chinese currency was pegged to US dollar at 8.28 Yuan to dollar (*Ila Patnaik, Market Access for Everyboy, The Financial Express, August, 17 2005*). China had artificially undervalued its currency and as a consequence it enjoyed trade surplus with US. The US blamed China for its trade deficit and threatened to impose Countervailing duties. As a counter move to this; China shed its pegged exchange rate and adopted market based exchange rate within a narrow band. The revaluation has significant implications for Indian rupee exchange rate.

The revaluation of Chinese currency has led to drastic changes in the Net FII Flows to India. The impact of the Chinese revaluation can be understood with a simple logic. As an outcome of Yuan revaluation, there is a tendency for Indian rupee to appreciate. The appreciating rupee would further invite dollar inflows and consequently greater FII inflows. The nuances of relation between exchange rate and FII inflows can be captured through the interest parity condition. Thus this will lead to the following two impacts, i.e. either the currency of the Asian Countries will appreciate with the revaluation of Yuan, thus making it profitable for them to bring US dollars into India now and take money out when there is a currency appreciation. Or, if the domestic currency does not appreciate, India's exports will become more competitive with respect to China, Indian companies will do well, stock prices will rise giving the Foreign investors a profit on their return.

4.2 Oil Price Hike:

At present the international price of oil has touched \$70 (*Shares, Rupee, Bonds skid on oil worries, The Financial Express, August 30, 2005*) per barrel mark. Uptil now the major portion of the burden was taken by the Government through reduction in import duties on crude oil and through subsidization; thus causing concerns about the fiscal stability of the Government. It is now inevitable for the Government to shift the burden to consumers through a hike in prices. This would fuel inflationary tendencies in the economy as crude oil is major raw material for the manufacturing sector.

If we look from the perspective of PPP Theory then the following equation will emerge:

$$E_{\$/\text{Rs}} = P_{\$/P_{\text{Rs}}}$$

In this case with a rise in oil prices the P_{Rs} will rise leading rupee to depreciate. When there is depreciation in the Indian Rupee this will make the investment in the domestic country unprofitable and thus there will be decrease in FII inflows.

5. CONCLUSION

The strength of the financial system of the country is gauged by the quality of foreign capital inflows. The financial system should be strong enough to ward off any adverse impact arising from the volatility of capital flows. It must be equipped with adequate support measures like forex reserves, comfortable balance of payments position to negate the impact of volatile capital flows. It is only then that the adverse impact of contemporary global developments like oil price hike can be minimized.

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