

**LIBERALISATION AND INTEREST RATE POLICY
IN INDIA**

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SROBONTI CHATTOPADHYAY



**Centre for Economic Studies and Planning
School of Social Sciences
Jawaharlal Nehru University
New Delhi – 110067
2007**



CENTRE FOR ECONOMIC STUDIES & PLANNING
SCHOOL OF SOCIAL SCIENCES
JAWAHARLAL NEHRU UNIVERSITY
NEW DELHI-110067, INDIA

17th July, 2007

CERTIFICATE

This is to certify that the dissertation entitled 'LIBERALISATION AND INTEREST RATE POLICY IN INDIA' submitted by me in fulfillment of the requirement of the degree of **Master of Philosophy** of this University is my original work and has not been previously submitted, in part or full, for the award of any degree of this University or any other University.

Srobonti Chattopadhyay
(SROBONTI CHATTOPADHYAY)

We recommend that this dissertation be placed before the examiners for evaluation.

Pradipta Chaudhury
Prof. Pradipta Chaudhury
Chairperson

CHAIRPERSON
Centre for Economic Studies & Planning
SSS/JNU New Delhi-110067

Prabhat Patnaik
Prof. Prabhat Patnaik
Supervisor

SUPERVISOR
CESP/SSS/JNU

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CHAPTER 1

INTEREST RATE DETERMINATION WITH FREE FINANCIAL FLOWS

Introduction:

The process of globalization and liberalization has entailed greater integration of countries across the world through increasing volumes of trade and capital flows. Increasing openness to trade and capital flows leading to greater interdependence among economies has long moved on from the realm of theoretical debate to that of the practical agenda. Indeed, the decades of 1980s and 1990s have witnessed a generalized shift in policy stance towards openness among a number of emerging market economies – either spontaneously, in the hope of reaping the benefits of greater volumes of trade and external investment or under the compulsions arising out of crisis situations. A series of financial crises in several open economies have marked these two decades, arising out of volatile capital flows. Monetary policy, in an open economy can affect the direction and volume of capital inflows and outflows. So, fresh debates have once more been back on stage regarding the role of monetary policy in maintaining stability in an open economy. The very process of opening up exposes the economy to global shocks on the one hand, and extends the closed economy domestic resource constraints on the other. Thus the economic phenomena in developing countries, after opening up, start to be conditioned to a large extent by the situations prevailing in countries which are the dominant players in the world economy.

In a globalized world, monetary policy formulation has become more complex and interdependent. A key concern that seemingly guides the conduct of monetary policy is how to reap the benefits of market integration while minimizing the risk of market instability. It is increasingly being recognized, that central banks need to take account of developments in the global economic situation, and in exchange rate movements while formulating monetary policy. When the capital movements are sensitive to interest rates domestically and abroad, then by raising interest rates the central bank can encourage capital inflows, and discourage capital outflows. Globalized financial markets play an

increasingly important role in the transmission of monetary developments from one part of the world to another for several reasons. First, cross-border ownership of securities immediately transmits the effect of changes in market values of equities in one region to another. Second, the correlation between equity markets worldwide has increased in recent years. Third, large country-specific shocks and common shocks (for instance, oil shocks, the recent rise and fall in information technology and related sectors) add to international linkages. So, even though monetary policy is conducted exclusively for domestic goals, the international linkages have to be taken into account in policy formulation.

Section 1.1: The Mundell-Fleming Model

Robert A. Mundell (1963) and J. Marcus Fleming (1962) had discussed the monetary dynamics of international adjustment and role of financial policies in an open economy set up. Both of them have dealt with the impact of monetary policy under fixed and flexible exchange rate regimes.

The paper by Mundell concerns the theoretical and practical implications of the increased mobility of capital. He starts his paper by assuming the extreme degree of capital mobility that prevails when a country cannot maintain an interest rate different from the general level prevailing abroad. The assumption of perfect capital mobility can be taken to mean that all securities in the system are perfect substitutes. Because of the involvement of different currencies, its implication is that existing exchange rates are expected to persist indefinitely (even when the exchange rate is not pegged) and the spot and forward exchange rates are identical. All the complications associated with speculation, the forward market, and exchange rate markets are thereby assumed not to exist.

In order to focus attention on policies affecting the level of employment, Mundell assumes unemployed resources, constant returns to scale, and fixed money wage rates; this means that the supply of domestic output is elastic and its price level constant. He

further assumes that savings and taxes rise with income, that the balance of trade depends only on the rate of interest, and that the demand for money depends only on income and the exchange rate, that investment depends on the rate of interest, and that the demand for money depends only on income and the rate of interest. The final assumption that he makes is that the country under consideration is too small to influence foreign incomes or the world level of interest rates.

Fleming started his paper by assuming a simple Keynesian model, in which taxation and private income after tax both vary directly with income, private expenditure on consumption and investment varies directly with income after taxation and inversely with the interest rate, the interest rate varies directly with the income velocity of money (the ratio of national income to the stock of money), the balance of trade, i.e. exports less imports of goods and services, varies inversely with domestic expenditure and directly with the domestic value of foreign exchange, and the balance of payments in capital account varies directly with the rate of interest. All magnitudes have been expressed in domestic wage units, and wages are assumed to remain constant in the domestic currency. No account is taken of any changes in the propensity to spend from real income changes that result from changes in the terms of trade. No account is taken, initially, of the effect of exchange speculation on capital movement.

Essentially the Mundell-Fleming model on international capital flows, suggested that a permanent interest-rate difference causes a permanent capital flow. If the central bank raises the domestic interest rate, thus making the domestic bonds more attractive, compared to foreign bonds, the domestic and foreign investors build up their holding of domestic bonds. In the Fleming-Mundell framework, they continue to build them up for as long as the interest-rate incentive persists, and the additional flow demand for domestic bonds shows up as a continuous capital inflow. If there is no substitutability at all between the foreign and domestic bonds, then an interest-rate difference would fail to cause any capital flow. Hence, in such a situation, monetary policy will fail to influence capital flow. On the other extreme, the domestic and foreign bonds may be perfect substitutes. Then even a slightly higher domestic interest rate (as compared to a foreign

interest rate) would cause an immediate switch from foreign to domestic bonds. Thus even the tiniest difference in interest rates will be driven back to zero by the investors' decision to switch completely from foreign to domestic bonds. In that case, the central bank would have absolutely no control on domestic interest rate. However, when there is imperfect substitutability, which seems to be more realistic, the central bank retains control over the domestic interest rate, and the size of continuing capital flow depends on the interest rate difference. The fundamental conclusion that emerges from the Fleming-Mundell model is that in a world with free capital mobility, as long as there will be differences in real interest rates of various countries, then the securities for the countries with higher interest rates will be more attractive to the investors leading to an enhanced demand for these securities. This will cause the interest rates in these countries to come down. Just the opposite will hold good for the countries with lower interest rates, i.e. they will experience a continuous capital outflow. Whenever there is an interest rate differential across countries, this equilibrating mechanism comes into play and it eliminates the differential.

Section 1.2: What is the International Interest Rate?

The most obvious question, that arises while speaking about the equalization of domestic interest rate of any country and the international interest rate, is what is meant by the international interest rate in this context? More specifically, what rate is it to which the domestic interest rate will be equal in presence of international flow of finance? Patnaik (2002) has argued that capitalism cannot function without a stable medium in which wealth can be held: stable in the sense that its value in terms of a 'representative' element from the world of all other commodities does not generally decline, and hence is not expected to decline, at a rate large enough to offset whatever carrying-cost advantage it may have *vis-à-vis* this 'representative' commodity. Money typically plays this role. Now, when more than one capitalist economy, each having its own fiat money, exists then at least one money has to be there, which can perform the role of a stable medium of holding wealth in terms of which the rates of movement in the prices of commodities and (its own domestic) labour power would be bounded. (Indeed, historically, leaving out

periods of crisis, there has been one such currency, the “dominant currency”). “But if another money also has to act as a medium of holding wealth, then, it must have a fixed exchange ratio with the first, for, otherwise, with unrestricted freedom of movement from one money to another, the first, since it is considered stable, will drive out the second.”¹

When there is unrestricted capital movements across countries, either the two countries will have a fixed exchange ratio so that they become one money in effect, or alternatively, if their exchange ratios are liable to change, only one of the two moneys will tend to constitute the stable means of holding wealth. This latter possibility arises because, in the absence of a general expectation on the part of the wealth-holders that the exchange ratio between the two moneys will not deviate too far from some given level (in which case they become, in effect, one money), any actual deviation from this level would set up a cumulative deviation in the same direction, until one of the moneys ceases to be a medium of holding wealth.

Empirically it has been observed that in absence of any international interest rate fixing authority, the country whose currency is held as the reserve currency by most of the countries do not face the threat of a run on its currency and hence tend to dominate the international financial market thus determining the level of “international” interest rate, i.e. the domestic interest rate of these countries tends to become the representative for the “international” interest rate. Very evidently this country is the US, because despite the fact that after 1973, the system of dollar standard has been abolished, still the amount of US dollar reserve of any country is considered to be an indicator of the economic strength of that country and still now the international accounts are mostly settled in terms of US dollars. This is to a large extent because the US still dominates the world trade quite substantially. Ghosh (2007) while discussing the impacts of financial liberalization on the developing economies, has noted that, the current global financial system is obviously characterized by a high degree of centralization. With United States financial institutions intermediating global capital flows, the investment decisions of a few individuals in a few

¹ Patnaik (2002)

institutions virtually determine the nature of the “exposure” of the global financial system.

Section 1.3: A Critique of the Mundell – Fleming Model

The Mundell-Fleming model, however, rests on the proposition that, in the process of equalization of rates of return across countries, the identities of the countries do not matter at all. But it has been argued against this position that the identities of the countries do matter²: given identical rates of return, finance, irrespective of originating in the first or the third world, would preferably flow into the first world, which, constitutes the home base of capitalism, rather than staying on in the third world, which, according to its point of view, contains greater elements of risk and uncertainty. In order to prevent capital flight, therefore, the rate of return on otherwise comparable assets has to be higher in absolute terms in the third world countries than in their first world counterparts, in a world with free mobility of finance. This implies that the real rate of interest, as a representative for rate of return, would generally tend to be higher in the former than in the latter. To illustrate this, let us denote the interest rate in India by r_1 and that in U.S., by r_2 , the risk premium required for investing in India relative to the U.S. by s , and the expected rate of depreciation of the rupee vis-à-vis the dollar by e , then the net advantages of investing in the two countries will be $r_1 - s - e$ and r_2 respectively. These two must equal in the equilibrium. The expected rate of depreciation of the rupee vis-à-vis the dollar, however, has two components: one arises because of the higher expected rate of inflation in India, and the other arises for other reasons having to do with the prevailing balance of payments situation, etc. Assuming that the expected rate of inflation in each country is the same as the prevailing rate of inflation, denoting these by p_1 and p_2 respectively, and denoting the expected rate of depreciation of the rupee vis-à-vis the dollar for reasons other than inflation by d , the equilibrium condition can be rewritten as:

$$r_1 - p_1 - s - d = r_2 - p_2$$

² Patnaik (2003) in “Financial Liberalization and Credit Policy” and Sircar (2005)

Assuming that the Reserve Bank of India pursues an 'appropriate' exchange rate policy, i.e. $d = 0$, (while $s > 0$) we get the conclusion that in a world of free capital flows the real rate of interest in India will be higher than that in the U.S. by an amount that compensates for the higher risks of investing in India (from the point of view of international wealth-holders). However, alternatively, it is often thought that risks and uncertainty are captured in the expectation about the level of the exchange rate, and therefore interest rates in developing countries adjusted for the expected exchange rate changes tend to be equalized in a world of capital mobility, regardless of the distinction between industrial and developing countries. The argument in terms of the above equation, would amount to saying that, $s = 0$, but $d > 0$. In either case, however, the real interest rate, i.e. the nominal minus the rate of inflation, would be higher in a third world country as compared to a first world one. In other words, as long as investing in the third world is intrinsically more risky from the point of view of international investors because of the quality of the habitat, then no matter how we capture this risk, the equilibrium real interest rate in a world of capital mobility must be higher in the third world than in the first world country.

However, how we capture risk becomes important, as risks refer to the dispersion of the probability distribution of expected returns and taking expected rate of exchange rate depreciation, which refers to a mean value, as a measure of risk would amount to using the mean of one probability distribution (expected exchange rate) to measure the dispersion of another (expected rates of return). Also, the assumption that any excess of the real interest rate in a third world country arises only because the exchange rate is expected to decline, while representing risks solely in terms of expected exchange rate depreciation, seems to be a rather bizarre one when it has actually remained unchanged over a considerable time. Moreover, the risks of investing in a third world country may arise from a host of factors having to do with the habitat itself: strikes, acute social conflicts, terrorist movements, prospects of emergence of radical populist governments, diseases and other manifestations of mass deprivation. To say that all these are cognized by international investors exclusively through an expectation of exchange rate depreciation and not by making any direct allowance for risk, is unconvincing.

This however does not mean that the interest rate is not determined by the monetary policy, but that monetary policy is itself constrained in the matter of fixing the interest rate, which means that there is a floor to the real interest rate (on average) below which it cannot fall without jeopardizing the balance of payment.

Section 1.4: Interest Rate is not a Single Variable

After all these discussions on whether interest rates actually equalize, the question that still needs to be addressed is what is the interest rate that we are talking about? Although in the Fleming-Mundell framework, theoretically we perceive interest rate to be a single variable, in reality, however, there is a whole spectrum of interest rates. These can broadly be categorized into the short term and the long term rates of interest. Nicholas Kaldor³ has elaborately discussed on the determination of and relationship between the short-term and the long-term interest rates.

After all these discussions on whether interest rates actually equalize, the question that still needs to be addressed is what is the interest rate that we are talking about? Although in the Fleming-Mundell framework, theoretically we perceive interest rate to be a single variable, in reality, however, there is a whole spectrum of interest rates. These can broadly be categorized into the short term and the long term rates of interest. Nicholas Kaldor has elaborately discussed on the various spectrum of interest rates as discussed by Keynes. Kaldor presented an evaluative article⁴ on chapter 17 of Keynes' *The General Theory of Employment, Interest and Money*, where Keynes had made an attempt to explore the fundamental properties of interest and money by means of the concept of the "own-rates of interest". The concepts with which Keynes had operated in the concerned chapter are:

(I) The own-rate of own-interest of a commodity (or asset), which is best defined as a return, in terms of that commodity, of a loan of that commodity, and which is the same

³ Kaldor (1980)

⁴ ibid

thing as the amount of the commodity which can be bought for forward delivery in terms of a given amount of the same commodity for spot delivery.

(II) The own-rate of money interest, which is the own-rate of own-interest of an asset corrected for the expected appreciation of that asset in terms of money.

(III) The “marginal efficiency” of an asset, which is the relationship of its future return, not to its present price, but to its present cost of production.

Keynes distinguishes between the yield of assets (measured in terms of themselves), denoted by q^5 , their carrying cost (c), also measured in terms of themselves, and the “potential convenience or security” represented by the owners’ “power of disposal” over an asset, which he calls its liquidity premium, l . Kaldor, however, preferred to use a different reasoning by treating the latter notion as simply the negative of the marginal risk premium (r) – in other words, instead of regarding liquidity as an addition to the yield, and representing it as a deduction from the yield of those assets which, on account of their imperfect marketability, carry a risk premium for which the yield must compensate.

Irrespective of regarding “liquidity” as a positive attribute of some assets, or “illiquidity” (the lack of liquidity) as a negative attribute of others, it is clear that different assets possess liquidity or suffer from illiquidity in varying degrees. Hence, if Keynes’ method of regarding liquidity premium as a positive attribute is followed, some asset whose liquidity premium is zero has to be found out before it is possible to ascertain the actual value of this premium in the case of other assets whose liquidity is greater than zero. In Kaldor’s method, however, no such problem arises, since the “illiquidity discount” of money is necessarily zero, and this sets a standard against which the illiquidity discounts, or “risk premia”, of other assets can be measured.

⁵ The yield, q , can either be a convenience yield (when the carrying of stocks of a commodity reduces the cost of production of that, or some other, commodity) or a money return (the rent of a house, the interest on a security, or the profit on a machine).

A further advantage with this method is that the technique here focuses attention on the fact that the advantage of holding stocks of money does not consist solely in its liquidity (in the sense of its ready availability for conversion into other forms of holding wealth, and the certainty of its future value in terms of the units of account); money as a commodity also possesses a “convenience yield” to the money-user which is similar to the convenience yield of wheat to the miller or stocks of cotton to the yarn-maker, and which is quite distinct from its comparative advantage as a general store of value. With Keynes’ method these two attributes of money, its convenience yield and its liquidity, become inseparable – yet the latter is necessarily comparative (i.e. it depends on the character of alternative forms of holding wealth), whereas the former is not.

This technique, however, can be questioned, since it clubs together the “illiquidity risk” of assets (consisting of their imperfect marketability or transferability into other forms of investment, and the uncertainty of the value of the assets relative to their return) with other forms of risk (such as the uncertainty of the future return underlying the so-called lender’s and borrower’s risks). Distinguishing between these risks and denoting them by separate symbols is of course possible. However, the market, by putting varying valuations on different assets in relation to their (apparent) return, enables one to impute a figure to all the different risks taken together, but it does not enable one to distinguish between them.

In Kaldor’s method, therefore, the own-rate of own-interest of any particular asset (or commodity), n , may be written, not as $q_n + l_n - c_n$, but as $q_n - c_n - r_n$; and the own-rate of money-interest – writing a_n for the expected appreciation of n (where $a_n = (EP - CP)/CP$). Writing suffix 1, 2, 3, 4,....., n for the various commodities or assets, the general condition of equilibrium (in which the marginal net advantages of holding various assets are equal) can be written in the form

$$a_1 + q_1 - c_1 - r_1 = a_2 + q_2 - c_2 - r_2 = \dots = a_n + q_n - c_n - r_n$$

This equality is secured (i) continually, and in the short period, through variations in the spot price of assets relatively to their expected price, which thus fills the gap left by

differences in $q-c-r$, the own-rates of own-interest of assets; (ii) over longer periods, through variations in the rate of production of assets relatively to their rate of consumption, which cause variations in own-rate of own-interest, $q-c-r$. In a full long period equilibrium, the a terms become zero; the amount and the composition of the stocks of various assets being such as to secure equality between the various own-rates of own-interest.

Money (in the strict sense as the commodity which is the universal medium of exchange) is one of the n assets. In the case of money, a is always zero, as there can be no uncertainty about its future value in terms of itself. For the same reason, r is necessarily zero, as there can be no uncertainty about its future value in terms of itself. And since in our world money is made of a perfectly durable material and its value is very large in proportion to bulk, c is also zero. Hence in the case of money the own-rate of own-interest is necessarily equal to the own-rate of money-interest and consists simply of q , the yield of money. This yield is in the nature of a "convenience yield", the value of which varies with the ratio of the money stock in relation to the expected turnover of payments, and which falls to zero when the monetary stock in circulation, in relation to the volume of money payments exceeds certain limits.

The nearest substitute for money consists of short-term financial "investments" of perfect security, such as ninety days' Treasury bills, or the savings deposits of first-class banks repayable at eight days' notice. These assets have practically all the advantages of money as a store of value except that they do not serve directly as a means of payment, but have to be converted for the purpose (savings deposits transferred in to current deposits, Treasury bills sold in the market, etc.), though with the virtual certainty that, apart from any inconvenience, the holder cannot be involved in more than a small financial loss if he unexpectedly requires to convert them. Hence, the yield of these money substitutes is largely governed by the yield of money itself – it will exceed the yield of money by a small risk premium which is fairly insensitive to the quantity of such assets, since the risks associated with the holding of these assets are in themselves insignificant. The carrying cost of these assets, similarly to money, can be taken as zero and, in the same

way, their expected appreciation in terms of money is also zero (since the latter, in this particular case, is the same thing as their yield). Hence writing q_1 for the marginal convenience yield of money, q_2 for the yield of Treasury bills (or *mutatis mutandis*, the interest paid on savings deposits) and r_2 for the risk premium associated with Treasury bills, the equilibrium condition reduces to

$$q_1 = q_2 - r_2$$

since a_1, c_1, r_1, a_2, c_2 are all equal to zero.

The implications of this are as follows:

First, any particular holder will divide his holding of “liquid assets” between “currency” and the “bills” in such a way as to equate the marginal convenience yield of his currency holding with the net return (i.e. interest-yield less the risk premium) obtainable on bill holdings. When the amount of currency in circulation, in relation to the prospective volume of payments, is so large that the marginal convenience yield of money falls to zero, the bill-rate of interest will be equal to r_2 , i.e. it will be equal and it is this risk premium which sets the bottom-stop to the bill-rate of interest – however large the quantity of money, investors will require some compensation, in the form of interest, for holding “bills” rather than “cash”.

Second, since neither q_1 nor r_2 are in any way dependent on future expectations concerning interest rates (long or short), changes in “liquidity preference” (i.e. in the preference for holding short-term against long-term assets) or in expectations as to future-interest-rates, can only induce changes in the yield of long-term paper and cannot affect the short-term rate.

Third, given the expected flow of money payments, and given the other factors which determine the desire for cash balances arising out of the transactions and precautionary motives, the marginal convenience yield of money will depend on the volume of money substitutes available, as well as on the volume of money itself (since the volume of these “money substitutes” is not under the control of the monetary authorities, or only very

imperfectly, the hypothesis that the quantity of “money” in circulation is fixed independently by the banking system is only of limited validity).

In a modern community, according to Kaldor, it is best to regard the short rate of interest q_2 (rather than the quantity of money) as being fixed by the policy of the monetary authorities and the quantity of money circulation as being determined by the demand for cash balances by the public, the latter being influenced also by the extent to which non-monetary liquid assets are available⁶.

After discussing how the short-term rate of interest rate gets determined, Kaldor himself has provided an implicit discussion on the determination of long-term rates of interest from the short-term rate. However, Michael Kalecki (1956) has elaborately and explicitly discussed the relationship between the short-term and the long-term rates of interest⁷. In Kalecki’s analysis, to establish a connection between the short-term and long-term rate of interest, the problem of substitution between a representative short-term asset say a bill of exchange and a representative long-term asset, say a consol, has been examined. The security holders, while considering how to invest their reserves, are likely to compare the results of holding various types of securities for a few years. Then they take into account the expected average discount rate over this period, denoted by ρ_e , and the present long-term rate of interest, r . Next the advantages or disadvantages of both types of securities are examined, the net result of which accounts for the difference between $r - \rho_e$.

The holding of bills guarantees the integrity of the principal. Bonds may depreciate in value during the period considered. Although short-period fluctuations in the value of securities may be disaggregated by the holder, but a capital loss of a more permanent character should be accounted as such. The capital loss occurs due to the depreciation of the bond per se and not to the need of converting it into cash as a time when the market position is unfavourable. Hence the provision for the risk of depreciation in value, γ , must be taken into account when yields r and ρ_e are compared. The advantages of holding

⁶ The availability of demand for money substitutes will affect, not only the demand for money at any given (short) rate of interest, but also its elasticity in response to variations of the rate of interest.

⁷ Chapter 6 and 7, “*The Theory of Economic Dynamics*”

bonds as against bills lie in the fact that ρ_e i.e. expected rate of discount involves uncertainty while rate of interest on bonds r , does not. Since the bills must be rebought every three months, this also involves some inconveniences and costs. These are, however, not very important. Denoting the advantages by ε , the net effect of disadvantages is $\gamma - \varepsilon$. For holding a bond one must have

$$r - \rho_e = \gamma - \varepsilon$$

Kalecki took γ to be roughly proportionate to $(p - p_{min})/p$, where p is the current price of a consol and p_{min} is the minimum to which the price of the consol may fall. Thus, $(p - p_{min})/p$ is the maximum percentage by which the price of consols is considered apt to fall. We thus have

$$\gamma = g \cdot ((p - p_{min})/p) = g \cdot (1 - p_{min}/p)$$

Now, since price of consols is in inverse proportion to their yield, i.e. $p = 1/r$, hence the above expression can be rewritten as

$$\gamma = g \cdot (1 - r/r_{max})$$

where r_{max} is the yield corresponding to the 'minimum price', p_{min} . By substituting this expression for γ , we obtain, after simple transformations:

$$r = (\rho_e / (1 + g/r_{max})) + ((g - \varepsilon) / (1 + g/r_{max}))$$

During 1849-1909, applying this formula to yield of British consols, the coefficients g , r_{max} and ε were observed to be more or less stable and hence r and ρ_e showed a linear functional relationship. The coefficients underwent a definite change after this chiefly during World War I, and again became stable in the post-war period. The most important result found was that ε i.e. the advantage, abstracting from the risk of depreciation, of bonds as compared with bills in small as expected *a priori*. In accordance with the *a priori* argument, the coefficient g is also small in both the pre-war and post-war periods. The considerable rise in g in between is explained by the much greater fluctuations in r after 1914 and by the rise in income taxes and surtaxes.

Also in conformity with the theory, the long-term rate did not show market cyclical fluctuations. The short-term rate normally falls in a slump and rises in a boom because the supply of money undergoes smaller fluctuations than the value of transactions. But, the long-term rate reflects these fluctuations only to a very small extent. Indeed, the long-term rate is based on the average short-term rate expected in the next few years rather than on the current short-term rate; moreover, the long-term rate changes considerably less than the expected short-term rate because the increase in it, that is, the fall in the price of bonds, makes the risk of their further depreciation less likely.

From these theoretical elaborations, what emerges is that the short-term interest rates are determined by the monetary authority, while the long-term rate is determined by the anticipations of the short-term rate based on past experience and by estimates of the risk involved in the possible depreciation of the long-term assets.

Section 1.5: The Need for a Key Policy Rate

From the above discussion, it emerges that the monetary authority determines one rate, which according to Kaldor is the short-term rate and the long-term rate gets determined from the anticipations about the short-term rate, as established by Kalecki. But in the modern world, in almost all economies, more than one types of interest rates prevail, so that instead of just two interest rates, a whole plethora of interest rates exist. In the presence of so many different types of interest rates as short-term and long-term rates, there arises the confusion about how all of them get determined. To do away with such confusions and to reduce the complexities in interest rate policy formulation, usually the Central Bank in a country or any other authority vested with the power to formulate the monetary policy for that country usually chooses to fix some particular interest rate(s), to which the other interest rates adjust. The particular rate(s) chosen by the monetary authority is (are) considered to be the key policy rate(s). A detailed discussion on the Indian key policy rate has been provided in Chapter 3 of this thesis. Now, for an open economy where there is free flow of international finance, the monetary authority or the Central Bank has to consider the situations prevailing in the international markets. For the

developing countries, the monetary authorities design the monetary policy so as to fix this key policy rate(s) in keeping with the monetary policy of the country which has the greatest strength in the international financial market, which is presumably the US. Therefore, the Indian key policy rate can be expected to be aligned to US key policy rate.

Section 1.6: Objective of the Thesis and Chapter Planning

The objective of this thesis is to find out after liberalization how far the Indian monetary policy has moved in line with the monetary policy in the US. For this purpose the thesis has basically looked at the Indian interest rate policy as against the US interest rate policy, reflected in the movements in interest rates for both the countries. The following chapter 2 discusses the process of India's opening up to capital inflows dealing with the various measures introduced to encourage the inflow of foreign capital in Section I, followed by the debates about capital account convertibility in the Section II. Chapter 3 deals with the movements in interest rates by looking at how the short-term and long-term interest rates have moved in India Section I, relationship between the short and the long term rates of interest for India in Section II and finally the relationship between the US and Indian key policy rates in Section III. Chapter 4 looks at the connection between the financial flows and interest rates. Finally chapter 5, which is the concluding, chapter talks about the issue of capital account convertibility with a brief reference to the East Asian financial crisis, and the implications of capital account convertibility for India in the current context.

CHAPTER 2

THE PROCESS OF INDIA'S OPENING UP TO CAPITAL INFLOWS

Section 2.1: Major Components of Foreign Investment in India

After the unfolding of economic reforms in 1991, however, as in the case of several emerging market economies the world over, India has experienced surges in capital flows, especially since 1993. The inflows of capital has eased the external constraint and helped pursue liberalization in various fronts like trade, foreign investment and industrial policies and financial markets as well to a significant degree. By freeing restrictions on current account transactions and by accepting obligations under Article VIII of the International Monetary Fund's (IMF) Articles of Agreement, from August 20, 1994, international confidence in the Indian economy has been built up, providing a basis for capital flows to be durable in character⁸. The existence of interest rate differentials and a stable exchange rate, reflecting as they are the policy stance, have on their part, enabled continued capital inflows into India. Foreign investment in India consists of two broad categories: foreign direct investment (FDI) and foreign portfolio investment (FPI). FDI can be further classified into some few categories: FDI subject to Government approval, FDI subject to the approval by the Reserve Bank of India (RBI), FDI by Non-Resident Indians (NRIs), acquisition of shares⁹, equity capital of unincorporated bodies¹⁰, reinvested earnings and other capital¹¹. FPI consists mainly of Global Depository Receipts (GDRs), American Depository Receipts (ADRs), Foreign Institutional

⁸ RBI Annual Report, 1994-95, pp.80

⁹ It relates to acquisition of shares of Indian companies by non-residents under Section 29 of FERA i.e. Foreign Exchange Regulation Act. Data on such acquisitions have been included as part of FDI since January, 1996 (RBI Annual Report, 1998-99). Since 1999, however, it relates to acquisition of shares of Indian companies by non-residents under Section 5 of FEMA i.e. Foreign Exchange Management Act, 1999 (RBI Annual Report, 2001-02).

¹⁰ It started to be incorporated as a separate entry since 2000-01 (RBI Annual Report, 2002-03).

¹¹ The coverage of FDI inflows has been widened since 2000-01 to approach the international best practices. FDI data since 2000-01 include, besides equity capital, 'reinvested earnings' (retained earnings of FDI companies) and 'other direct capital' (incorporate debt transactions between related entities).

Investments (FIIs) and off-shore funds and others. In this context it seems of some relevance to provide a slightly detailed idea about the ADR and the GDR.

American Depository Receipts (ADRs):

An ADR represents ownership in the shares of a foreign company trading on U.S. financial markets. The stock of many non-U.S. companies trades on U.S. exchanges through the use of ADRs. ADRs enable U.S. investors to buy shares in foreign companies without undertaking cross-border transactions. ADRs carry prices in U.S. dollars, pay dividends in U.S. dollars and can be traded like the shares of U.S. companies.

Each ADR is issued by a U.S. depository bank and can represent a fraction of share, a single share, or multiple shares of foreign stock. An owner of an ADR has the right to obtain the foreign stock it represents, but U.S. investors usually find it more convenient simply to own the ADR. The price of an ADR is often close to the price of the foreign stock in its home market, adjusted for the ratio of the ADRs to foreign company shares.

Depository banks have numerous responsibilities to an ADR holder and to the non-U.S. company the ADR represents. The largest depository bank is the Bank of New York.

Individual shares of a foreign corporation represented by ADRs are called American Depository Shares (ADS)¹².

Global Depository Receipts:

Global Depository Receipts¹³ (GDRs) are essentially equity instruments created by Overseas Depository Banks (ODBs) which are authorized by the issuing companies in India to issue outside the country GDRs to non-resident investors against the shares of the issuing companies held with the nominated domestic custodian banks. The shares

¹² This entire definition and description of ADRs have been provided in <http://en.wikipedia.org>

¹³ This description of GDRs has been provided in RBI Annual Report, 1993-94, pp.74 -75.

correspond to the GDRs in a fixed ratio, say of 1 GDR= 10 shares. The GDRs could be issued in a negotiable form. GDRs can be redeemed at the price of the corresponding shares of the issuing company ruling on the date of redemption. For all good purposes, GDRs can be treated as direct investment in the issuing companies. There are, however, ceilings on foreign equity participation. They can be traded on international markets. Companies seeking to raise funds from abroad through the issue of GDRs will need to obtain prior permission from the Government of India (Ministry of Finance).

After the discussions on GDR and ADR, it seems of interest here to have a look at the annual amounts of various components of FDI and FPI in order to have a fairer idea about the routes through which the major part of the foreign finance is flowing into India.

2.1. A: Foreign Direct Investment or FDI

The following Table 2.1.1 shows how the amounts of the different components of FDI have varied over the years since the introduction of economic reforms in India.

Table 2.1.1: Components of FDI

(US \$ million)

Year	Government (SIA/ FIPB) (1)	RBI (2)	NRIs (3)	Acquisition of shares (4)	Equity Capital on Unincorporated Bodies (5)	Reinvested Earnings (6)	Other Capital (7)	Total (1)+(2) + (3)+(4) +(5)+(6)+(7)
1991-92	87	..	63	..	..	..	..	150
1992-93	238	42	61	..	..	..	..	341
1993-94	314	89	217	..	..	..	..	620
1994-95	701	171	442	..	..	..	..	1314
1995-96	1249	169	715	..	..	..	..	2133
1996-97	1922	135	639	125	..	..	..	2821
1997-98	2754	202	241	360	..	..	..	3557
1998-99	1821	179	62	400	..	..	..	2462
1999-00	1410	171	84	490	..	..	..	2155
2000-01	1456	454	67	362	61	1350	279	4029
2001-02	2221	767	35	881	191	1646	390	6131
2002-03	919	739	..	916	126	1498	462	4660
2003-04	928	534	..	735	190	1798	488	4673
2004-05	1062	1259	..	930	112	1508	367	5652
2005-06 P	1126	2233	..	2181	280	1676	255	7751

P: Provisional

SIA: Secretariat for Industrial Approval

FIPB: Foreign Investment Promotion Board

Source: RBI Annual Report, various issues.

A look at the Table 2.1.1 reveals that among the various components of FDI, the one subject to Government approval has maintained a more or less steady character. FDI subject to RBI approval has also recorded a steady growth over time. But, FDI by NRIs started rising since 1992-93, reached a peak in 1995-96 and started declining again (except for the year 1999-00 when it marked a temporary increase), until it reached a

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lowest in 2000-01. After that till 2005-06, it never showed up as a significant component of FDI. During the year 1998-99, all the first three components of FDI and also FDI as a whole marked a decline in their respective levels owing to financial turmoil in the world economy, imposition of economic sanctions and sluggishness in domestic activity which had some bearing on foreign investment during the year. In the following two years, the over all level of FDI did not recover reflecting subdued industrial activity. The over all level of FDI marked an increase in 2000-01 reaching a level of US \$ 4029 million from US \$ 2155 million during 1999-00, mainly as a result of the components (5), (6) and (7) in Table 2.1.1. However, during 2001-02, inflows under FDI touched a high of US \$ 6131 million thus demonstrating growing global investors' confidence in the Indian economy. But again in 2002-03, the over all level of FDI marked a decline on account of a fall in inflows through SIA/FIPB route¹⁴. FDI flows remained subdued during 2003-04 also, in line with the slowing down of FDI flows to the developing countries in general¹⁵. The improvement in FDI flows during 2004-05 reflected the impact of recent initiatives aimed at creating an enabling environment for FDI and encouraging infusion of new technologies and management practices¹⁶. FDI flows into India were 37 per cent higher during 2005-06 on the back of positive investment climate, improved growth prospects and initiatives aimed at rationalizing and liberalizing the FDI policy and simplifying the procedures¹⁷.

¹⁴ RBI Annual Report, 2002-03, pp.110

¹⁵ RBI Annual Report, 2003-04, pp.101

¹⁶ RBI Annual Report, 2004-05, pp. 81

¹⁷ RBI Annual Report, 2005-06, pp. 96



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2.1.B: Foreign Portfolio Investment or FPI

The next Table 2.1.2 shows the changes in the levels of the various components of FPI over the years during the post liberalization era.

Table 2.1.2: Components of FPI

(US \$ million)

Year	Global Depository Receipts	Foreign Institutional Investors	Non-Resident Indians	Offshore Funds and Others	Total
1991-92	-	-	8	-	8
1992-93	86	1	5	-	92
1993-94	1,460	1,665	15	350	3,490
1994-95	1,839	1,503	-	239	3,581
1995-96	149	2,009	-	56	2,214
1996-97	918	1,926	-	20	2,864
1997-98	645	979	-	204	1,828
1998-99	270*	-390	-	59	-61
1999-00	768*	2,135	-	123	3,026
2000-01	831*	1,847	-	82	2,760
2001-02	477*	1,505	-	39	2,021
2002-03	600*	377	-	2	979
2003-04	459*	10,918	-	-	11,377
2004-05	613*	8,686	-	16	9,315
2005-06 P	2,552*	9,926	-	14	12,492

*: These figures include both Global Depository Receipts (GDRs) and American Depository Receipts (ADRs)

P: Provisional

Source: RBI Annual Report, Various Issues

Portfolio investment inflows started surging only since 1993-94, as becomes clear from an inspection of Table 2.1.2. FPI which had recorded values equaling US \$ 3,490 million and US \$ 3,581 million respectively in 1993-94 and 1994-95 respectively fell to U.S. \$ 2,214 million during 1995-96 being adversely affected by the slump in inflows on account of GDRs of the Indian corporates in Euro markets¹⁸. The bearish domestic

¹⁸ RBI Annual Report, 1995-96, pp.71

market conditions coupled with the restrictions on utilization and placement of proceeds of Euro issues, which remained in force up to November, 1995 had a dampening influence on corporates accessing funds from overseas markets¹⁹. With effect from November 25, 1995, however, companies were allowed to bring issue proceeds into the country in anticipation of end-use, while ceilings on use of funds for corporate restructuring including working capital were raised from 15 per cent to 25 per cent of the GDR issue. Furthermore, the condition relating to the approval of GDR issue of a track record of good performance of a minimum of three years was relaxed in the case of the companies in the infrastructure sector²⁰. In response to these policy shifts, several Indian companies launched GDR issues of around U.S. \$ 480 million in the last quarter of the year²¹. The total amount repatriated to the country against the GDR issues, however, was only U.S. \$ 149 million during 1995-96. There was an increase in portfolio investment during 1996-97 mainly because of the renewed demand for Indian Global Depository Receipts (GDRs) as overseas market conditions improved. A number of relaxations regarding issuance of GDRs announced during the year in the face of a sluggish domestic capital market prompted Indian corporates to raise a large amount via GDR issues²². These companies raised U.S. \$ 918 million during the year 1996-97 while amount repatriated to India from the GDR proceeds was U.S. \$ 650 million. Investments by Foreign Institutional Investors (FIIs) during 1996-97 remained almost at the level of the preceding year with the cumulative inflows up to March, 1997, touching U.S. \$ 7.5 billion. The overheating of international capital market during the year prompted the FIIs to diversify their surplus investible funds to emerging capital markets like India as an effective hedging measure²³. At the same time, strong fundamentals of the economy along with other investment incentives announced during the year and stable exchange rate expectations provided a congenial climate for investment of these funds in India. During 1997-98, however, net portfolio flows experienced a decline, coming down to the level of US \$ 1,828 million, since investments by the FIIs slackened in relation to the preceding year in view of the currency turmoil in South-East Asia and the rising stock

¹⁹ RBI Annual Report, 1995-96, pp.71

²⁰ *ibid*, pp.73

²¹ *ibid*

²² RBI Annual Report, 1996-97, pp.117

²³ *ibid*

prices in the U.S. providing a safe haven²⁴. Deceleration in industrial activity and bearish sentiment in stock exchanges also dampened the financial prospects of corporates and adversely affected FII activity²⁵. During 1998-99, net FPI inflows turned negative owing chiefly to net outflows under investment by FIIs and lower offerings of GDRs, resulting from turbulence in the international financial markets, imposition of economic sanctions and sluggishness in the domestic activity²⁶.

The FPI inflow, however, recovered to the level of US \$ 3026 million during 1999-2000 due to the restoration of orderly conditions in the international financial markets coupled with pro-active policy initiatives on macroeconomic management. In August 1999, a Foreign Investment Implementation Authority (FIIA) was established for speedy conversion of approval of actual flows. The Insurance Regulatory and Development Act (IRDA) were passed in December, 1999, permitting foreign equity participation in domestic private insurance companies up to 26 per cent of the paid-up capital. Moreover, investments in all sectors, except for a small negative list, were placed, in February, 2000, under automatic route for direct investments through issue of ADRs/ GDRs without prior government approval and up to 50 per cent of these proceeds were allowed for acquisition of companies in overseas markets. Indian companies could acquire companies engaged in information technology and entertainment software, pharmaceuticals and biotechnology in the overseas market through stock-swap options up to U.S. \$ 100 million on automatic basis or ten times the export earnings during the preceding final year as reflected in the audited balance sheet, whichever is lower²⁷. Furthermore, the Union Budget 2000-01 raised the limit of investment by FIIs in equity shares of Indian companies from 30 per cent to 40 per cent. In addition, with a view to expanding the investor base, foreign corporates and high net worth individuals were permitted to invest in Indian markets through FIIs registered with the Securities and Exchange Board of India or SEBI²⁸.

²⁴ RBI Annual Report, 1997-98, pp.94

²⁵ *ibid*

²⁶ RBI Annual Report, 1998-99, pp.128

²⁷ RBI Annual Report, 1999-2000. pp.108

²⁸ *ibid*

The uncertainty characterizing international financial markets led to a decline in FII²⁹ during 2000-01, which accounted for the reduction in the level of FPI during that year. This declining trend in FPI continued during 2001-02 also. Weak stock markets pulled down the level of FII³⁰, again during 2002-03, and consequently the level of FPI as a whole to US \$ 979 million.

There had been a sudden surge in the level of FPI during 2003-04 to US \$ 11377 million. Portfolio flows were recycled to India following readjustments of global portfolios of institutional investors, triggered by the robust improvement in macroeconomic fundamentals, financial performance of the corporate sector and the buoyant and the attractive valuations in the Indian equity markets relative to other emerging market economies (EMEs) in Asia³¹. During 2004-05, after a slight moderation of this surge, with the level of FPI coming down to US \$ 9,315 million, owing chiefly to a decline in the level of FII, the level of FPI again increased to US \$ 12,492 million during 2005-06, largely as a result of a drastic rise in the level of ADR/GDR.

2.1.C: Non-Resident Indian (NRI) Deposits

The Indian government, even during the few years preceding the reforms, had been keen to enhance the level of NRI deposits which constitutes a major component of total foreign finance inflow into India. With this motive, after liberalization also, the Government of India introduced several schemes in order to encourage the NRI deposits further.

With a view to tiding over the foreign exchange crisis faced by the country during 1990-91, the Reserve Bank of India (RBI) introduced in November, 1990 a new scheme called the Foreign Currency (Bank and Others) Deposit Scheme [FC(B&O)D]³². The terms and conditions of this scheme were: (i) the FC(B&O)D Scheme was open to foreign citizens/banks and/or other institutions as against only NRIs/Overseas Corporate Bodies

²⁹ RBI Annual Report 2000-01, pp.112

³⁰ RBI Annual Report, 2002-03, pp.110

³¹ RBI Annual Report, 2003-04, pp.101

³² RBI Annual Report, 1991-92, pp.77-78

(OCBs) in the case of FCNR accounts; and (ii) withdrawals before maturity was strictly not allowed. However, this scheme was suspended from July 31, 1992.

With a view to providing further incentives and giving wider options to non-residents, including Overseas Corporate Bodies owned by them, a new Non-Resident (Non-Repatriable) Rupee Deposit Scheme (NR(NR)RD)³³ was announced during 1991-92. The salient features of the Scheme are as follows:

Authorized dealers would be permitted to accept deposits under this Scheme by way of transfer of foreign exchange funds from outside India or from existing NRE/FCNR accounts. The funds transferred to this new non-repatriable rupee Scheme would be converted into rupees at the prevailing exchange rate at the time of placing the deposit and these funds will no longer be repatriable. The deposits under the new Scheme, which can be accepted for maturities of six months to three years, would not be considered as part of net Demand and Time Liabilities or DTL for purposes of reserve requirements and as such these deposits would be free from any reserve requirements. Lending out of these deposits would not be considered as part of net bank credit for purposes of determining priority sector lending. These deposits and advances out of them would not be subject to interest rate regulations and as such banks will be free to determine the deposit and lending rates under this Scheme. Banks would be able to offer attractive deposit rates under this Scheme. Deposits would be free to move from one bank to another; but once these deposits are withdrawn from the banking system they would no longer enjoy these facilities even if they return to the banking system. With these attractive features, authorized dealers will be able to mobilize substantial deposits under the Scheme and attract foreign exchange to a non-repatriable basis without any exchange risk.

During the few years preceding 1992-93, the large reliance on the Foreign Currency Non-Resident Accounts (FCNRA) emerged as a matter of concern³⁴. Borrowings under this scheme had been costly owing to the interest rate differentials offered and the exchange rate protection provided under the Scheme. The burden of exchange loss devolving on the

³³ RBI Annual Report, 1991-92, pp.17

³⁴ RBI Annual Report, 1992-93, pp.11

Reserve Bank was an integral element of the cost of mobilizing funds under the FCNRA Scheme. The experience during the balance of payments crisis of 1990-91 and 1991-92 had shown that the FCNRA Scheme could be quite volatile as became evident in the outflow of US \$ 1.6 billion from these accounts during 1991-92. It was in this context that attempts had been made to restructure the existing FCNRA Scheme and to put in place new schemes which would (i) reduce the reliance on FCNRA Scheme, (ii) make exchange risk cover a commercial proposition and (iii) reduce the volatile component of deposits under the existing FCNRA Scheme. Therefore, new Schemes such as the Non-Resident (Non-Repatriable) Deposit (NRNR) Scheme and the Foreign Currency (Ordinary) Non-Repatriable Deposit (FCON) Scheme were introduced to offer schemes with diverse features to attract a wide range of deposits than can be accommodated by any single scheme³⁵.

In April, 1993, a new Foreign Currency (Non-Resident) Accounts (Banks) Scheme was introduced and became effective from May 15, 1993. The Scheme was similar to the existing FCNR Scheme with one major difference. While the deposit rates would be the same as those prescribed for the existing FCNR Scheme and repatriation of funds will be freely permitted in foreign currencies, the Reserve Bank of India would not provide exchange rate guarantee to banks for deposits under the new Scheme and as such the exchange risk would be borne by the banks themselves. To enable banks to absorb exchange risk, the deposits under the new Scheme would not be subject to any lending rate stipulations and such lending would not be considered as part of the net bank credit for the purpose of determining priority sector lending. The existing FCNR Scheme was also to be continued simultaneously, but such deposits could be accepted only for periods over one year and up to three years. However, the FCNRA Scheme was terminated in August, 1994³⁶. The FCON Scheme, the response to which was not so encouraging, was also discontinued with effect from August 20, 1994³⁷. A new deposit scheme, non-

³⁵ RBI Annual Report, 1992-93, p.11

³⁶ RBI Annual Report, 1994-95, pp.83

³⁷ RBI Annual Report, 1993-94, pp.97

resident special rupee account [NR(S)RA], with similar facilities as applicable to domestic resident accounts, was introduced in mid-April 1999³⁸.

The following 2.1.3 shows the amount of inflows (outflows) under the various schemes over the years.

Table 2.1.3: Inflows (Outflows) under various NRI Deposit Schemes

(US \$ million)

Year	FCNRA	FCNR(B)	NR(E)RA	NR(NR)RD	FCON	F(B&O)D	Total
1991-92	- 1627	..	-27	..	..	304	-1350
1992-93	825	..	343	610	1	350	2129
1993-94	-1317	1075	727	1187	17	-576	1113
1994-95	-2249	1979	1000	682	-7	-558	847
1995-96	-2796	2669	-208	1279	..	0	9448
1996-97	-1949	1773	1244	2246	..	..	3314
1997-98	-2305	971	1197	1256	..	..	1119
1998-99	-1	-144	980	941	..	..	1776
1999-00	..	337	835	318	..	..	1540
2000-01	..	904	860	553	..	..	2317
2001-02	..	594	1626	508	..	..	2748
2002-03	..	526	6195	-3745	..	..	2976
2003-04	..	762	4695	-1186	..	..	3641
2004-05	..	492	84	..	..	..	576
2005-06	..	1612	1177	..	..	..	2789

Source: RBI Annual Report, Various Issues.

An inspection of the Table 2.1.3 reveals that under the FCNRA scheme, since 1991-92 till 1997-98 there had been a continuous outflow except for the year 1992-93. Under the FCNR(B) scheme, however, more or less consistent inflows have been recorded, except for the year 1998-99. As far as the NR(E)RA scheme is concerned, except for the years 1991-92 and 1995-96, there had been no outflow, although huge variations have been observed in the amounts of inflows under this scheme, ranging from US \$ 84 million (during 2004-05) to US \$ 6195 million (during 2002-03). The NR(NR)RD scheme, there had been outflows for two consecutive years 2002-03 and 2003-04, to the order of US \$ 3745 million and US \$ 1186 million respectively. Prior to that, during 1992-93 to 2001-02, there had been consistent inflows under this scheme. The FCON and the F(B&O)D

³⁸ RBI Annual Report, 1998-99, pp.129-130

schemes, however, since 1995-96 did not show any significant inflow or outflow. During 1992-93 and 1993-94, the inflows amounting to US \$ 1 million and US \$ 17 million respectively had been recorded under the FCON scheme, while the year 1994-95 recorded an outflow of US \$ 7 million. There had been inflows of US \$ 304 million during 1991-92 and US \$ 350 million during 1992-93 under the FC(B&O)D scheme, but for both the years 1993-94 and 1994-95, outflows were recorded under this scheme with their respective amounts being US \$ 576 million and US \$ 550 million. The NR(S)RA scheme has not been able to experience any substantial inflows so far, and therefore never showed up as a significant component of the total NRI deposit inflows.

With the discussion on the major components of foreign finance inflow into India, the question that needs to be addressed is about the implications of further liberalization of the capital account. Therefore the next section proceeds to look into the various debates concerning the impact of capital account convertibility on the growth prospects especially of the developing countries.

Section 2.2: The Debates about Capital Account Convertibility

A spate of financial crises in various countries across the world has marked the decade of 1990s largely as result of risks emanating from the capital account of the balance of payments. The more open is the capital account of a country, the greater is the probability of that country being hit by the financial crisis that has originated elsewhere. As a consequence, the capital account has come to receive increasing attention in policy making. Various questions have been raised about the desirability and extent of capital account convertibility especially for developing countries. There are arguments both in favour of and against increasing the openness of the capital account.

Proponents of the efficient markets hypothesis argue that an open capital account is likely to bring along general financial efficiency, specialization and innovation by exposing the

financial sector to global competition. Gruben and McLeod (2001)³⁹ observed that higher growth might result from greater financial openness across a large number of countries and the significant decline in global inflation. Capital account liberalization, in conjunction with other policies could contribute significantly in the take-off of less developed countries, and to the extent that it does, it would have large benefits (Gourinchas and Jeanne, 2002)⁴⁰. To sustain an excess of investment over domestic saving, developing countries require external capital and an open capital account paves the way for attracting foreign capital. Residents, then, have the scope to base their investment and consumption decisions on world interest rates and world prices for tradable which could lead to an enhancement of their welfare. By setting prices right, an open capital account enables aggregate savings and investments to be optimized, leading to both allocative efficiency and competitive discipline. Capital flow permits nations to trade consumption today for consumption in the future to engage in inter-temporal trade (Eichengreen *et al.*, 1999)⁴¹. Again, by offering the opportunity of using the world market to diversify portfolios, an open capital account enables both savers and investors to protect the real value of their assets through risk reduction. On the other hand, capital controls might lead to hidden capital flight and/or diversion of savings into real assets and gold leading to sub-optimal use of internal resources.

In the neo-classical framework capital flows contribute to growth primarily by supplementing domestic savings. In endogenous growth framework, capital flows contribute to growth through the spillovers associated with foreign capital in the form of technology, skills, and introduction of new products as well as positive externalities in terms of domestic financial markets resulting in improved resource allocation and efficient financial intermediation by domestic financial institutions. Since the spillovers and externalities associated with different forms of foreign capital could vary, a pecking order approach to the composition of capital flows is often pursued by prioritizing the capital flows based on the growth enhancing role of each form of capital.

³⁹ Report on Currency and Finance, 2002-03, pp.224

⁴⁰ *ibid*

⁴¹ *ibid*

Joshy and Little (1996) have taken the view that selective opening of the capital account is the correct strategy. The attractiveness of the Indian market could be increased considerably, even with the present levels of deregulation, simply by improving the trading and settlement system in securities markets. They do not support full-scale liberalization at this stage of the reform process. The danger of excessive capital inflows is that they can lead directly or indirectly to an excessive expansion of bank balance sheets. Experiences in many countries both in Asia and Latin America have shown that in this process two significant threats arise: (a) a deterioration in credit quality as banks increase their risk exposure (this phenomenon is encouraged by the fact that in practice banks can always rely on a government safety net); (b) maturity mismatch as short-term capital inflows are invested in long-term or illiquid assets resulting in acute difficulties when the funds are pulled out. In India, these potential dangers have to be taken seriously because regulatory systems are in their infancy, banks are inexperienced in functioning in open economies, and handling foreign exchange risks, and capital market institutions are as yet not resilient enough to absorb shocks arising from sudden volatility.

While they espouse the aim of capital market liberalization, they thus agree with those who believe that it should come later in the reform process after trade liberalization, financial regulation, and fiscal consolidations are further advanced.

However, there are counter arguments to these views. The most significant change that has taken place in world capitalism in recent years, as noted by Patnaik (2003)⁴² is the emergence of a new form of international finance capital, which is not backed by only some few particular advanced capitalist nation-states, but rather is a fluid mass that extracts finance from all over. It breaks barriers to its unregulated movement across the world, and that is fundamentally on the lookout for quick profits and hence speculative in character, rather than having any sustainable links with industry. What is more, far from giving rise to inter-imperialist rivalries, it is perhaps an important factor contributing to a recession of such rivalries; since a world broken up by rivalries is not very conducive to

⁴² in his essay "*Imperialism and Diffusion of Development*"

the global fluidity of speculative finance in search of quick gains, it exerts pressure for muting rivalries.

Three implications of this phenomenon of globalized finance capital are of relevance here. First, it undermines the possibility of Keynesian demand management, and indeed of any state intervention for boosting the level of activity. This is not to say that the state 'retreats' from the sphere of economy, but, rather, the nature of its intervention undergoes a change. When such intervention in the earlier period invoked the 'national' interest, this was not without a rationale, for example, when state intervention in the capitalist countries was directed palpably towards boosting the level of virtually all domestic social groups. Likewise, when the state intervened in the underdeveloped countries for building up the productive base of the economy through 'development planning', it could not be accused objectively of serving only the sectional interest of some particular domestic social group. But state intervention in contemporary capitalism, whether in the advanced or in the backward economies, gets increasingly oriented towards serving the narrow sectional interests of the globalized finance capital in order to keep up its 'confidence' in the economy.

There are at least two distinct reasons why Keynesian demand management is undermined by speculative financial flows. First, any boosting of activity to levels close to 'full employment', as was the aim in the heyday of Keynesianism, gives rise to expectations of inflation and currency depreciation, so that long before the economy comes near full employment a flight of finance capital occurs which realizes these very expectations (providing a retrospective justification for them), and thereby forces a contraction of the level of activity. Second, when this boosting is done under the aegis of the state, especially through higher state spending for purposes other than militarism, this becomes all the more a cause for panic in financial circles, since an activist state of this genre appears too radical for comfort. The only ways, then that an advanced capitalist country can achieve high levels of activity and employment in these conditions are: either if it is so decisively the financial centre of the world that the sheer expansion of its financial sector which must necessarily occur in the era of globalized finance is enough to

generate high employment; or if its currency is so decisively the lynchpin of the entire system that everyone has confidence in its value even when the economy of the country has high levels of activity.

Patnaik and Rawal (2005)⁴³ have argued that the 'opening up' of an underdeveloped economy to free capital flows, instead of boosting its rate of growth as neo-liberals claim, would have the precisely opposite effect of unleashing *ceteris paribus* a tendency towards stagnation and greater unemployment. The neo-liberal claim, according to them, is based on the assumption that such 'opening up' would cause a substantial increase in the rate of productive investment in the economy. This claim, even if much direct foreign investment were to flow to the economy, is not necessarily valid, since such foreign direct investment (FDI) inflow may well be of the sort that replaces the domestic investment, and hence (its import content as well as the import-content of output flow it generates being higher than that of domestic investment) causes unemployment and a reduction in the level of activity ('de-industrialization'). In addition, however, such 'opening up', while bringing in very little foreign direct investment in practice (no matter domestic-investment-replacing sort or not) typically exposes the economy to the vortex of globalized speculative financial flows, and such exposure necessarily has an adverse effect on the level of activity, which in turn by damaging the inducement to invest, unleashes or accentuates the tendency towards stagnation. They also observe that the average level of activity, through the fluctuations arising from the random movement in financial inflows, is lower in an economy with a flexible exchange rate than would prevail with capital controls.

Several other arguments have also been put forward against the liberalization of the capital account e.g., potential macroeconomic instability arising from the volatility of short-term capital movements; the risk of large capital outflows and associated negative externalities; export of domestic savings from capital scarce developing countries; and weakening the ability of authorities to tax domestic financial activities, income and

⁴³ Patnaik and Rawal (2005), pp. 1449-1458

wealth. There is also the potential risk of the “Dutch Disease Effect” due to large capital inflows and appreciating real exchange rate diverting resources from tradable to non-tradable sectors in the face of the rising external liabilities. Inefficient financial markets with asymmetric information could also lead to risk of financial bubbles. Besides, premature liberalization could lead to currency substitution and capital flight, balance of payments crises, depreciation and inflation. It is argued that monetary contraction not only slows economic activity through the normal interest rate channels but also can threaten the health of the economy through the banking system (Kaminsky and Reinhart, 1999)⁴⁴. Although financial globalization, in theory, help to promote economic growth through various channels, there is as yet no robust empirical evidence that financial integration helps developing countries to improve growth rates and reduces macroeconomic volatility (Prasad *et al.*, 2003)⁴⁵.

The growing global macroeconomic imbalance, getting manifested in the large and sustained current account deficit of the US, suggests that markets may at times allocate global saving differently from what is perceived by the policy makers as appropriate and sustainable in the long run. Like the effect on resource allocation, the beneficial effects of capital account liberalization on growth are ambiguous. There is no evidence that countries without capital controls have grown faster, invested more, or experienced lower inflation (Rodrik, 1998)⁴⁶.

Unlike the ambiguity surrounding the resource allocation argument, there is greater unanimity on the point that an open capital account exerts pressures to discipline domestic macro-economic and financial environment. Disciplinary effects of an open capital account on the fiscal deficit suggest that complete freedom for outward capital mobility could be associated with a reduction in the budget deficit (Kim, 1999)⁴⁷. Gourinchas and Jeanne (2002)⁴⁸ emphasized that many EMEs may benefit from the discipline effect rather than the conventional resource allocation effect. If the benefits of

⁴⁴ Report on Currency and Finance, 2002-03, pp.224

⁴⁵ *ibid*

⁴⁶ *ibid*

⁴⁷ *ibid*

⁴⁸ *ibid*

capital market liberalization are smaller for the poorest countries than for the middle income countries, the same is probably also true of the costs (Gilbert *et al.*, 2000)⁴⁹.

Furthermore, controls on outflows are viewed by markets as an additional risk factor, and their prolonged use has often been associated with capital flight. Fischer (1998)⁵⁰ insisted that currency controls, no matter how well executed, impose distortions on the economy and the longer they are in place, the more serious they tend to get. Another fact that weighs against capital controls relates to their efficacy. Capital controls are not very effective, particularly when the current account is convertible, as current account transactions create channels for disguised capital flows. Capital controls intend to insulate domestic financial conditions from external developments. Even countries with extensive capital controls are, over the years, experiencing increasing influence of external financial conditions. Due to a reduction in the costs of evading the controls and increase in the attractiveness of holding assets in offshore markets, capital controls are growingly becoming ineffective. As per the squeezing on a balloon argument, capital being fungible, restrictions on one form of capital and not on others would quickly lead to displacement of flows to the uncontrolled segment (Quirk and Evans, 1995)⁵¹.

In the aftermath of the Asian crisis, however, the arguments in favour of reimposing capital controls have been strengthened. Controls on outflows could be broadly classified into preventive and curative controls. While the former intend to prevent balance of payments crises, the latter could be applied as a means to manage a crisis (as in the case of Malaysia). A review of the empirical studies on the effectiveness of both variants of control suggests that in almost 70 per cent of the cases where the controls on outflows were used as a preventive measure, a large increase in capital flight was observed after their imposition (Yoshitomi and Shirai, 2000)⁵². The support for using curative control came from Krugman (1998)⁵³ who suggested temporary use of controls amidst a crisis to avoid the adverse effects of a high interest rate defense of the exchange rate. Krugman

⁴⁹ *ibid*

⁵⁰ *ibid*

⁵¹ *ibid*

⁵² *ibid*

⁵³ *ibid*

justified temporary capital controls on the ground that the costs of any resulting distortions were likely to be lower than the alternative costs to the economy on account of higher interest rates and economic slump. The qualifications to this argument were fourfold, e.g., controls should disrupt ordinary business as little as possible, controls must be used as a temporary measure as distortions associated with controls tend to grow over time, controls may cause the greatest damage when the intention is to defend an overvalued exchange rate and controls must aid reforms and they should not be viewed as an alternative to reform. Bhagwati (1998)⁵⁴ asserted that full capital mobility was not a necessary condition for free trade. He advocated capital controls as a stop gap measure as part of the solution for Asia on grounds that it allowed these countries to adopt more expansionary monetary and fiscal policies and hence promoted a faster recovery of the real economy. Such a recovery could be expected to reduce the problems of insolvency and closure in the corporate sector and non-performing loans in the banking system. Stiglitz (1998)⁵⁵ contended that the cost of disruption due to swings in expectations is invariably high for developing countries. Thus, there exists a case for more direct intervention in less sophisticated economies. Given the nature of the international financial transactions, developing countries ought to give themselves as much freedom as they can to place prudential controls on the more volatile forms of capital movements, in particular capital and short-term flows (Agosin, 1998)⁵⁶. Gilbert, Irwin and Vines (2000)⁵⁷ felt that, “within a cost-benefit framework, the benefits of liberalization are seen as more modest than had previously been supposed, while the Asian crisis has increased our estimates of the potential costs of liberalization”.

While no conclusive end to the debate appears to be in sight, there is a general consensus that the case for capital account convertibility would rest on the circumstances and economic conditions specific to a country as also the extent of development of its markets and institutions.

⁵⁴ ibid

⁵⁵ ibid

⁵⁶ ibid

⁵⁷ ibid

CHAPTER 3

MOVEMENTS IN INTEREST RATES

Section 3.1: The Trends in the Movements of Interest Rates

It has already been discussed in Chapter 1 of this thesis, that, interest rate is not a single homogeneous variable; rather there is a broad spectrum of interest rates. Among them, one of the classifications talked about short-term and long-term rates of interest. Kalecki and Kaldor have both tried to theoretically establish a relationship between these two sorts of interest rates. Therefore, it seems of interest here to find out how the short-term and the long-term rates of interest has moved in India, both before as well as after the introduction of the liberalization measures in 1991.

Section 3.1.A: Movements in Short-term and Long-term Rates of Interest in India

The following Table 3.1.1 (also Figure 3.1.1) and Table 3.1.2 (also Figure 3.1.2) show the movements in the short-term and the long-term rates of interest in India during the pre liberalization and the post liberalization era respectively. The representation for the Indian short-term interest rate is the annual average value of the bank rate. As far as long-term interest rates are concerned, for the years prior to 1991, the long-term rates considered for the analysis are the coupon rates on government bonds whose maturity periods are more than 10 years but less than or equal to 20 years. For the post 1991 period, usually the interest rates on the government securities with a maturity period of 10 years have been taken into account as a representation for the long-term interest rate. Now for the years 2004-05 and 2005-06, the yield in percentage terms for the securities with a maturity period of 10 years is nil, so for the years 2004-05, the percentage yield on government securities with a maturity period of 9 years have been considered and for the year 2005-06, the percentage yield on the government security with a maturity period of 10 years and 10 months have been taken as the representation (since these two are the closest approximation for 10 years).

Table 3.1.1: Short and Long Term Interest Rates for India (Pre Liberalization)

Year	(per cent per annum)	
	Short-term Interest Rate	Long-term Interest Rate
1976-77	9.00	5.50
1977-78	9.00	6.00
1978-79	9.00	6.25
1979-80	9.00	6.50
1980-81	9.50	6.75
1981-82	10.00	7.25
1982-83	10.00	7.75
1983-84	10.00	9.50
1984-85	10.00	10.25
1985-86	10.00	10.50
1986-87	10.00	10.50
1987-88	10.00	10.50
1988-89	10.00	10.50
1989-90	10.00	10.50
1990-91	10.00	10.75

Source: RBI database and RBI Annual Report (Various Issues)

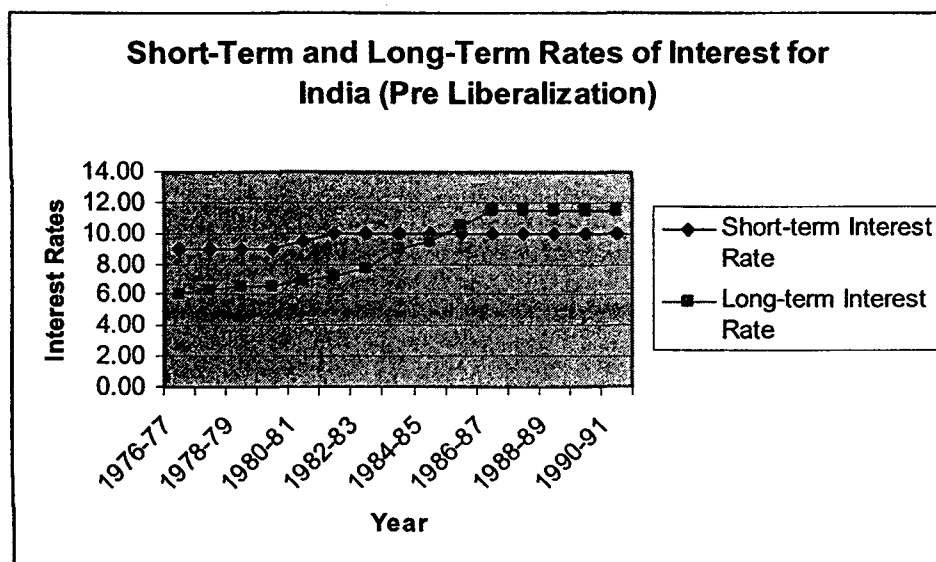


Figure 3.1.1

Table 3.1.2: Short and Long Term Interest Rates for India (Post Liberalization)

Year	(per cent per annum)	
	Short-term Interest Rate	Long-term Interest Rate
1991-92	12.00	12.75
1992-93	12.00	12.75
1993-94	12.00	12.35
1994-95	12.00	12.35
1995-96	12.00	13.75
1996-97	12.00	13.65
1997-98	10.50	12.75
1998-99	9.50	12.14
1999-00	8.00	11.69
2000-01	7.62	11.30
2001-02	6.75	9.39
2002-03	6.40	7.43
2003-04	6.02	5.32
2004-05	6.00	5.47
2005-06	6.00	6.91

Source: RBI database and RBI Annual Report (Various Issues)

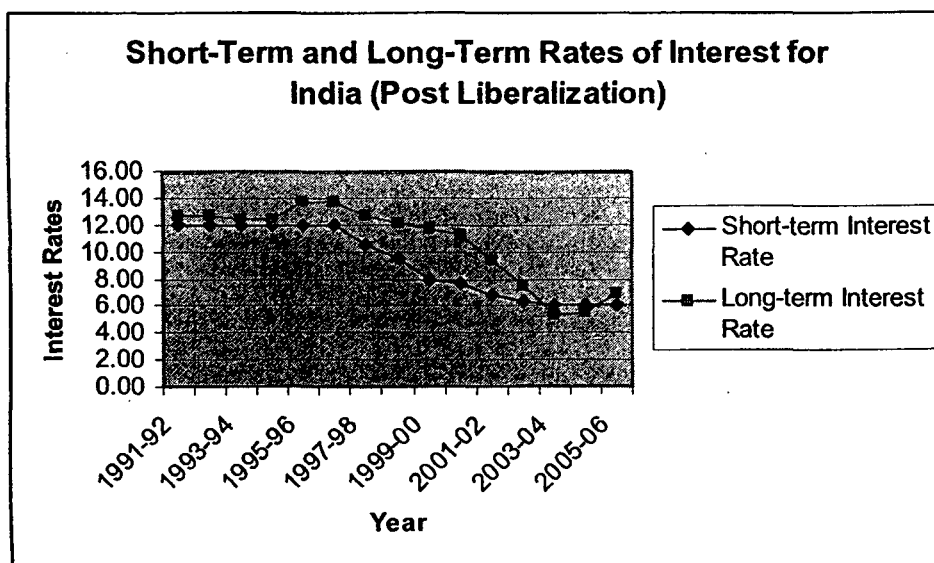


Figure 3.1.2

From an inspection of the tables and plots on short and long term interest rates during the pre liberalization period, it is observed that the long-term rate is mostly lower than the short-term rate. One possible explanation for this is that the government wanted to reduce

the amount in interest payment. Moreover, during the pre liberalization period, the government intervention in determining the levels of interest rates used to be more stringent, thus leaving not much scope for the market. During the post liberalization period, however, the long-term rate remains consistently higher than the short-term rate except for the years 2003-04 and 2004-05, where the long-term rate is marginally lower than the short-term rate. This case is, however, different from what Kalecki had dealt with, because the situation that he has analysed is one where the long-term rate keeps fluctuating thus at times exceeding and at times falling below the short-term rate. Still his argument, that long-term rate is determined by the anticipations of the short-term rate based on past experience, can be said to be holding good for India, from the trend reflected in the movement path.

Section 3.1.B: Movements in Interest Rates of India as against that in the US

Chapter 1 has also discussed that the US, by virtue of the US dollar still being the reserve currency for most of the countries in the world, tends to dominate the international financial market substantially, and therefore, it sets the international “standard” rate of interest, to which rest of the countries adjust their levels of interest rates. The liberalization of the Indian financial markets has established a greater link between them and the international financial markets. So, in this context, it seems of interest to empirically find out how far the Indian interest rate policies are getting harmonized to the interest rate policies in the US. The impact of liberalization on such a harmonization can be best understood by comparing the levels of interest rates prevailing at various different points of time before as well as after the liberalization. For this purpose comparisons have been made between the short-term annual average rates for India and the US and the long-term annual average rates for India and the US, both for the pre as well as the post liberalization years (as given by the following tables and figures 3.1.3-3.1.6). For this purpose, the representations for the annual short-term and long-term rates of interest for India have been taken to be the same as the ones in the Section 3.1.A. For the US, the annual average values of the Federal Funds Rate or FFR has been taken to be the representation for the annual short-term rate of interest and the annual rates of interest on

government securities with a maturity period of 10 years have been taken to be the representation for the long-term rate.

Table 3.1.3: Short-term Annual Average Rates of Interest for India and US (Pre Liberalization)

(per cent per annum)		
Year	US Rate	Indian Rate
1976-77	5.05	9.00
1977-78	5.54	9.00
1978-79	7.94	9.00
1979-80	11.20	9.00
1980-81	13.35	9.50
1981-82	16.39	10.00
1982-83	12.24	10.00
1983-84	9.09	10.00
1984-85	10.23	10.00
1985-86	8.10	10.00
1986-87	6.80	10.00
1987-88	6.66	10.00
1988-89	7.87	10.00
1989-90	9.21	10.00
1990-91	8.10	10.00

Source: RBI database, RBI Annual Report (Various Issues) and Federal Funds Reserve database

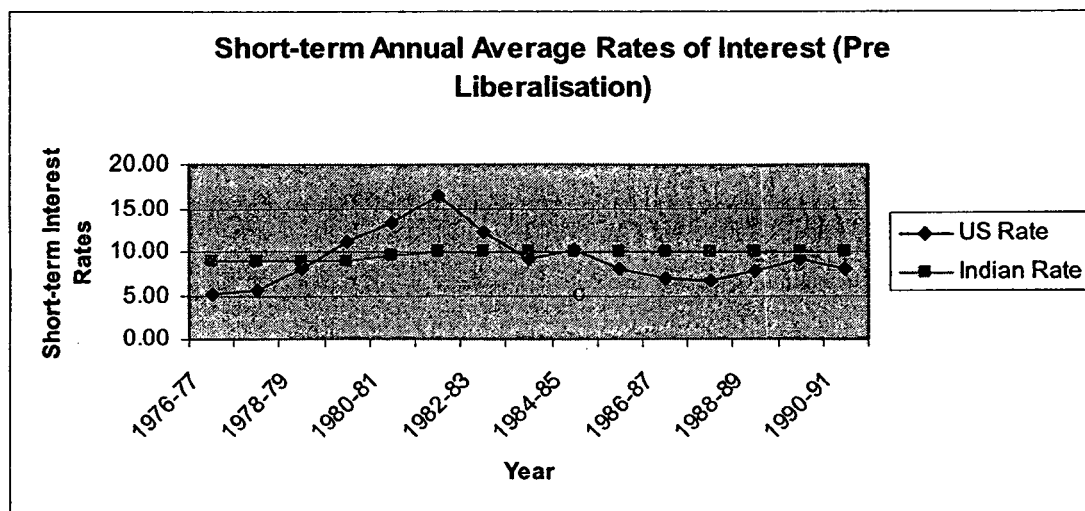


Figure 3.1.3

Table 3.1.3 and Figure 3.1.3 show the movements in short-term annual average rates of interest for India and the US during the years prior to the liberalization. The Indian short-term interest rate more or less remains steady without much fluctuations, only with a slight increase during 1980-81 and 1981-82, while the short-term interest rate for the US shows some ups and downs. The two, however, do not reflect any similar movements, quite as expected; because during the pre liberalization years the Indian economy was quite insulated from the rest of the world, so interest rate determination used to be conditioned more by the domestic economic phenomenon and the incidents at the international level were not of so much relevance.

Table 3.1.4: Short-term Annual Average Rates of Interest for India and US (Post Liberalization)

(per cent per annum)

Year	US Rate	Indian Rate
1991-92	5.69	12.00
1992-93	3.52	12.00
1993-94	3.02	12.00
1994-95	4.21	12.00
1995-96	5.83	12.00
1996-97	5.30	12.00
1997-98	5.46	10.50
1998-99	5.35	9.50
1999-00	4.97	8.00
2000-01	6.24	7.62
2001-02	3.88	6.75
2002-03	1.67	6.40
2003-04	1.13	6.02
2004-05	1.35	6.00
2005-06	3.22	6.00

Source: RBI database, RBI Annual Report (Various Issues) and Federal Funds Reserve database

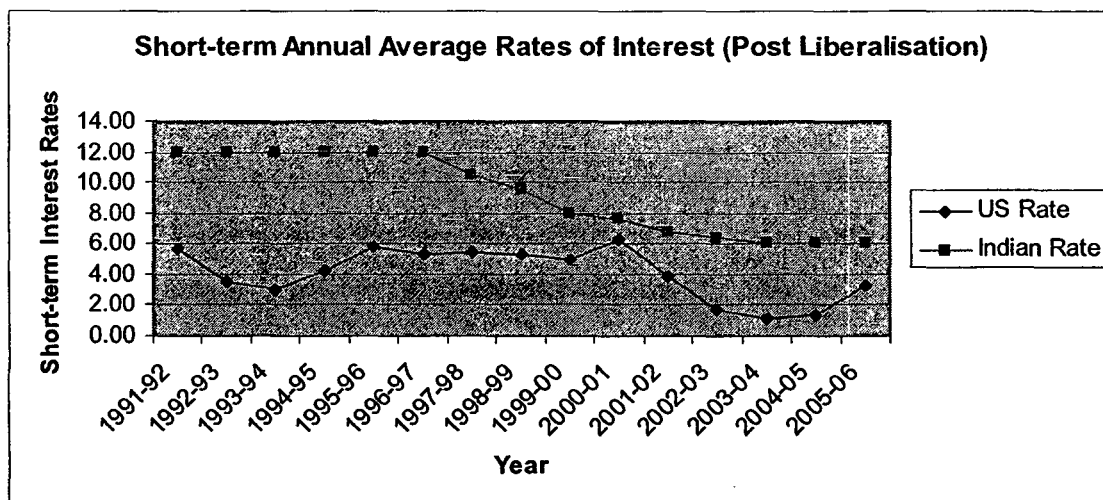


Figure 3.1.4

Table 3.1.4 and Figure 3.1.4 capture the movements in short-term annual average rates of interest for India and the US during the post liberalization years. After liberalization, however, the Indian short-term interest rate has shown some responses to the changes in the short-term interest rates in the US especially since 2000-01.

Table 3.1.5: Long-Term Annual Average Rates of Interest for India and US (Pre Liberalization)

(per cent per annum)

Year	US Rate	India Rate
1976-77	7.61	5.50
1977-78	7.42	6.00
1978-79	8.41	6.25
1979-80	9.43	6.50
1980-81	11.43	6.75
1981-82	13.92	7.25
1982-83	13.01	7.75
1983-84	11.1	9.50
1984-85	12.46	10.25
1985-86	10.62	10.50
1986-87	7.67	10.50
1987-88	8.39	10.50
1988-89	8.85	10.50
1989-90	8.49	10.50
1990-91	8.55	10.75

Source: RBI database, RBI Annual Report (Various Issues) and Federal Funds Reserve database

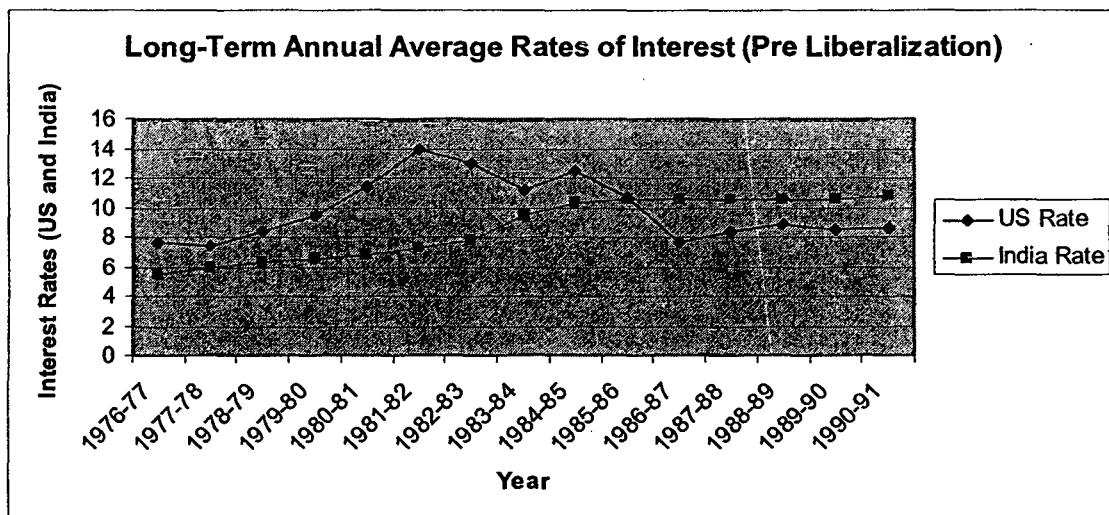


Figure 3.1.5

Table 3.1.5 and Figure 3.1.5 show the movements in the long-term annual average interest rates for India and the US during the pre liberalization years. Here also, like the case of the short-term rate of interest, the Indian rate does not reflect any movement similar to that in the US for reasons analogous to the case of short-term interest rates during the pre liberalization years.

Table 3.1.6: Long-Term Annual Average Rates of Interest for India and US (Post Liberalization)

(per cent per annum)

Year	US Rate	India Rate
1991-92	7.86	12.75
1992-93	7.01	12.75
1993-94	5.87	13.40
1994-95	7.09	12.35
1995-96	6.57	13.75
1996-97	6.44	13.65
1997-98	6.35	13.05
1998-99	5.26	12.13
1999-00	5.65	11.69
2000-01	6.03	11.30
2001-02	5.02	9.39
2002-03	4.61	7.43
2003-04	4.01	5.32
2004-05	4.27	5.47
2005-06	4.29	5.32

Source: RBI database, RBI Annual Report (Various Issues) and Federal Funds Reserve database

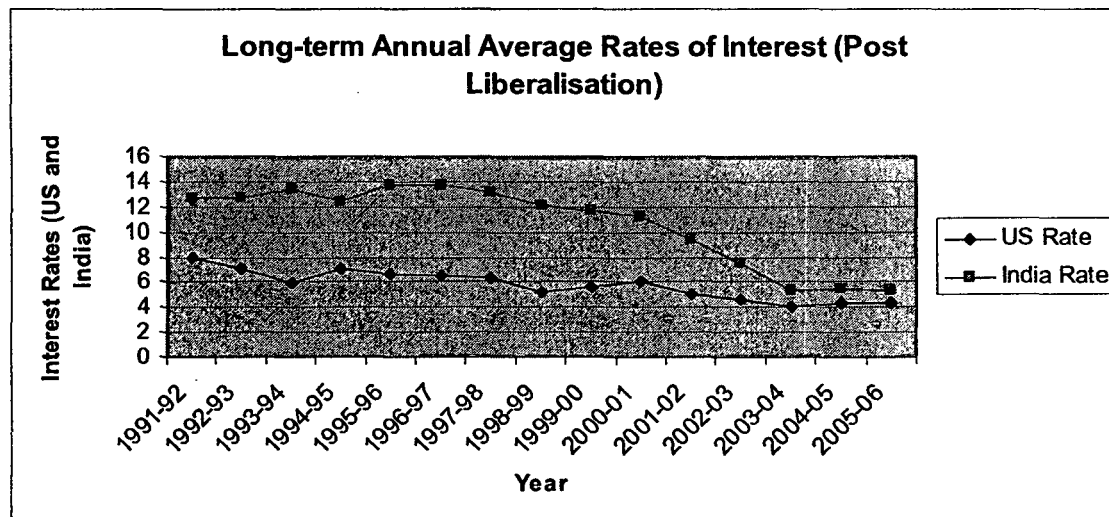


Figure 3.1.6

After liberalization, however, the long-term rate of interest, as reflected in the Table 3.1.6 and Figure 3.1.6, have shown some responses to the changes in the level of long-term rate of interest in the US. Especially after 2000-01, the Indian long-term rate has followed a more or less similar path as the long-term rate in the US.

With the discussion on the movements in various different interest rates, it seems to be interesting here to check how the various interest rates are related to each other. Therefore, the next section proceeds to find out whether any significant relationships exist between the short-term and the long-term annual average interest rates in India, between the short-term annual average interest rates of India and the US, both during the pre as well as the post liberalization years and finally between the long-term annual average interest rates of India and the US, again both during the pre as well as the post liberalization years.

Section 3.2: Relationship between the various Short and the Long Term Rates of Interest

To check for the existence of any significant relationship between the short-term and long-term annual rates for India, for both the pre and the post liberalization years, simple ordinary least square or OLS regression exercises have been performed, with the long-term rate as the dependent variable and the short-term rate as the explanatory variable. The results of the regressions are presented in the Appendix Table 3.A (pre liberalization) and Appendix Table 3.B (post liberalization). During the pre liberalization years there had been no significant relationship observable between the short-term and the long-term interest rates in India⁵⁸, as shown by the Appendix Table 3.A. After liberalization, however, as reflected in the Appendix Table 3.B, there is a positive relationship between the two rates concerned, which is significant at 5 per cent level, with the approximate value of R^2 being 0.79 and that of the adjusted R^2 being 0.77.

Another set of simple OLS regression exercises have been conducted to check for the relationship between the short-term annual average interest rate of India and the US, both during the pre as well as the post liberalization years, with the Indian interest rate as the dependent variable and the US interest rate as the explanatory variable. The results are

⁵⁸ To find out whether any regression result is significant or not, for this and all the subsequent regression results in this thesis, the value of the t statistic for the coefficient of the explanatory (or X) variable has been looked at; if this value lies outside the range between the lower and upper 95 per cent confidence limits, then the result has been inferred to be significant, otherwise insignificant.

presented in the Appendix Table 3.C and 3.D respectively for the pre and the post liberalization years. The results for the pre liberalization years as shown by the Appendix Table 3.C, show a significantly positive relationship between the two variables concerned, although the value of R^2 is pretty small (0.06 approximately) and that of the adjusted R^2 is negative (-0.009 approximately). Therefore, this result is not really suggestive for our purpose. The regression result for the post liberalization period, given in Appendix Table 3.D, shows a positive relationship between the two concerned interest rates, which is significant at 5 per cent level. The values of R^2 and adjusted R^2 , however, are not so high (the approximate values being 0.30 and 0.24 respectively).

Finally, to check for the relationship between the long-term annual average rates of interest for India and the US, a further round of OLS regression exercise has been performed, whose results are presented in Appendix Table 3.E and 3.F respectively for the pre and the post liberalization era, again holding the US interest rate as the explanatory variable and the Indian interest rate as the dependent variable. The regression results for the pre liberalization years, as reflected in Appendix Table 3.E, suggest that there is no significant relationship between the US and the Indian long-term annual average interest rates during the pre liberalization period. During the post liberalization era, however, as suggested by the Appendix Table 3.F, there is a significantly positive relationship at 5 per cent level, between the two variables concerned, and also the values of both, R^2 and adjusted R^2 , are quite impressive with their approximate values being 0.73 and 0.71 respectively.

From the discussion on the various regression results, it can be inferred, that after liberalization, the interest rate policy in India has been linked to that in the US, both for the short-term and the long-term rates of interest. The response of the Indian interest rate policy to that in the US, as observed in the preceding section, has been all the more visible since 2000-01. Therefore, the next section proceeds to find out whether the movements in the monthly short-term interest rates in India have shown any similarity to that in the US.

Section 3.3: Relationship between the US and the Indian Key Policy Rates

Since the annual average values of the Indian short-term interest rates have shown movements similar to that in the US, therefore, it is hypothesized that the monthly interest rates in India will also reflect a movement pattern similar to that of the US monthly interest rate. The hypothesis has been stated in the form of the two following propositions.

3.3 A: Hypothesis

Proposition 1: The short-term interest rate in India reflects a similar movement as that of the US i.e. the short-term interest rate in India responds by going up (or down) following an increase (or decrease) in the short-term interest rate in the US, but at the same time the Indian interest rate consistently maintains a margin with that in the US.

Proposition 2: The change in short-term interest rate in India occurs with a time lag as compared to that of the US, which means that there is a time lag involved in the process of the Indian short-term interest rate policy response to the changes in US short-term interest rate policy.

To check for the validity of these propositions, first the monthly data on the Indian and the US short-term key policy rates have been plotted. For the US the key policy rate is the Federal Funds Rate or FFR. For India, however, two different rates have been considered. One is the reverse repo rate, which is currently the key policy rate⁵⁹, and the other one is the bank rate which is also a major policy rate for India. A Liquidity Adjustment Facility (LAF) was introduced in June 5, 2000 to modulate short-term liquidity and signal short-term interest rates. The LAF operates through repo and reverse repo auctions thereby setting a corridor for the short-term interest rate consistent with policy objectives. Thus, since June 5, 2000, with the introduction of the LAF, repo rate became the key policy rate.⁶⁰ There had been a change in the nomenclature of the repo and the reverse repo rates since October 29, 2004. With effect from October 29, 2004, the nomenclature of repo and reverse repo has been interchanged as per international usage. Prior to that date,

⁵⁹ www.rbi.org.in

⁶⁰ RBI Annual Report, 1999-2000, p.80 and www.rbi.org.in

repo indicated absorption of liquidity while reverse repo meant injection of liquidity⁶¹. After October 29, 2004, reverse repo indicates absorption of liquidity while repo indicates injection of liquidity. Therefore, prior to October 29, 2004 repo rate used to be the same thing as the current reverse repo rate. Hence since June, 2000, the data considered the repo rate to be the representative rate (because with the introduction of the Liquidity Adjustment Facility or LAF repo rate became an important policy variable) and since November, 2004 till March, 2007, the data on reverse repo rate has been taken to be the representative one. Thus, two separate plots have been looked at, one with the bank rate plotted against the FFR and the other one with the repo or reverse repo (as the case may be) rates plotted against the FFR. These plots are presented in the following Figure 3.3.1 and Figure 3.3.2 respectively (the relevant tables for these plots have been presented in the Appendix Table 3.3.1 and 3.3.2 respectively).

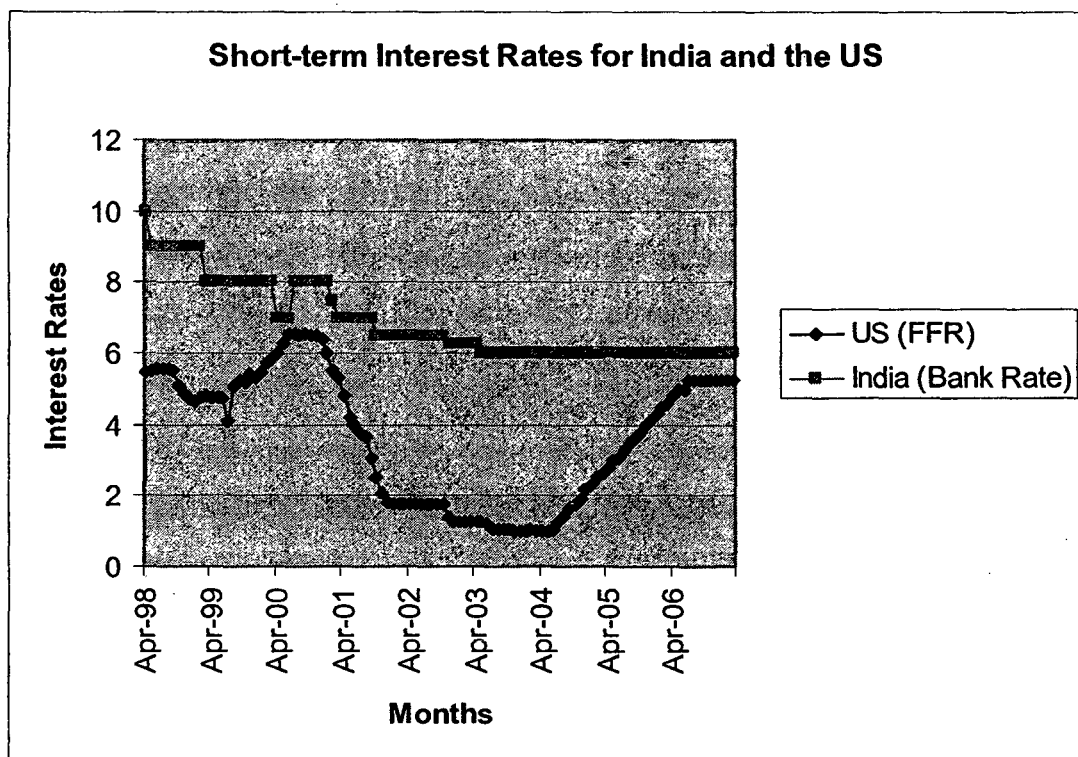


Figure 3.3.1

Source: RBI and Federal Funds Reserve database

⁶¹ RBI Annual Report, 2004-05, p.106 and RBI Bulletin, December, 2004

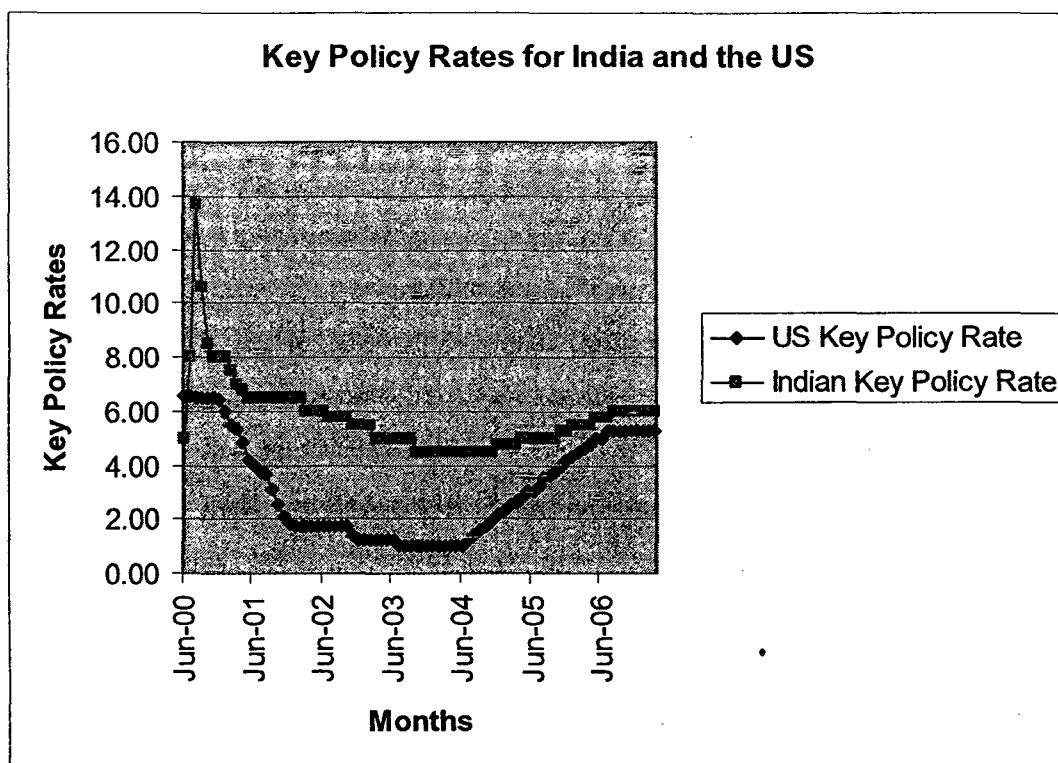


Figure 3.3.2

Source: RBI and Federal Funds Reserve database

The inspection of these plots clearly shows that till April, 2003, the bank rate showed a similar movement as the FFR and after that it remains steadily at the same level, while after October, 2000, the repo (or reverse repo as the case may be) rate has mostly reflected similar movements to the FFR with a few exceptions, though the process of response involved a time lag while both the rates consistently remained higher than the FFR.. There are few exceptions of course; for example we find that the repo rate has suddenly shot up to 10.50 per cent in September, 2000. This is because, with renewal of pressures in the foreign exchange market, the Bank Rate and the CRR were raised, standing facilities were temporarily halved and repo operations were employed to absorb liquidity and to signal the monetary stance. The cut-off repo rates gradually rose in August 2000 to the level of 13.68 (average for the month) and remained around 10.50 per cent (average) for most part of September 2000. Additional repo auctions with maturity

ranging from 3 to 7 days were also undertaken during this period. By mid-September 2000, market conditions began to improve. Market sentiment was rejuvenated by inflows in the form of India Millennium Deposits (IMDs) and other capital flows⁶². Interest rate measures undertaken earlier in the context of market turbulence were withdrawn⁶³. Therefore, the repo rate also came down again, first to 8.50 per cent in October, 2000 and then to 8.00 per cent in November, 2000, where it remained for the following two months. However, the Indian key policy rate, as becomes quite evident from Fig.3.3.2 above, has involved a time lag in responding to the changes in the US key policy rate. The time lags have been calculated by subtracting the value of interest rate in one period from that in the immediately following period, and whenever there is a change in sign in this difference, and the difference is more than 0.05 in absolute value, it has been noted as a change in the direction of interest rate (when the sign of the calculated difference turns from 0 to negative, or 0 to positive, or negative to positive, or positive to negative). The duration of the lags have been calculated and have been found to vary between 2 to 11 months, while mostly the value of the lags lie around 5 months. Thus it can definitely be inferred that the Indian key policy rate has a positive relationship with the US key policy rate though it involves a lagged response and also, the short-term key policy rates (monthly) for India consistently maintains a margin over that in the US.

3.3 B: Testing the Propositions

To check for the relationship between the US and Indian short-term monthly interest rates, two simple OLS regression exercises have been conducted with the same data set. The first regression takes the US FFR to be the explanatory variable and the Indian bank rate to be the dependent variable. The second regression again considers the US FFR to be the explanatory variable and the repo or the reverse repo (as the case may be) to be the dependent variable. The results of these regressions are presented in the Appendix Table 3.3.A and 3.3.B respectively. The Appendix Table 3.3.A suggests a positive relationship between the two concerned rates, significant at 5 per cent level, although the values of R^2

⁶² RBI Annual Report, 1999-2000

⁶³ *ibid*

and adjusted R^2 are not so high (the respective values being both approximately 0.37). The second regression results, as shown by the Appendix Table 3.3.B, suggest again a positive relationship between the two concerned rates, significant at 5 per cent level, but this time the values of R^2 and adjusted R^2 are slightly higher than the earlier one (the approximate values being 0.40 and 0.39 respectively).

Thus from the above analysis, it can be inferred that the Indian monthly short-term rate of interest bears a significantly positive relationship to the US monthly short-term rate of interest. Therefore, the hypothesis is empirically proven to be holding.

APPENDICES TO CHAPTER 3:

Appendix Table 3 A:

SUMMARY OUTPUT

<i>Regression Statistics</i>						
Multiple R	0.790872					
R Square	0.625478					
Adjusted R Square	0.596669					
Standard Error	1.433551					
Observations	15					

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	-29.1307	8.173941	-3.56386	0.003463	-46.7895	-11.472
X Variable	3.922414	0.84181	4.659501	0.000447	2.103794	5.741033

Appendix Table 3 B:

SUMMARY OUTPUT

<i>Regression Statistics</i>						
Multiple R	0.887657					
R Square	0.787935					
Adjusted R Square	0.771623					
Standard Error	1.413757					
Observations	15					

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	1.442997	1.376438	1.048356	0.313575	-1.53062	4.41661
X Variable	0.996866	0.143435	6.949969	1.01E-05	0.686994	1.306738

Appendix Table 3 C:

SUMMARY OUTPUT

<i>Regression Statistics</i>						
Multiple R	0.251929					
R Square	0.063468					
Adjusted R Square	-0.00857					
Standard Error	0.457076					
Observations	15					

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	9.356818	0.384199	24.35408	3.12E-12	8.526807	10.18683
X Variable	0.037365	0.039808	0.938618	0.36504	-0.04864	0.123365

Appendix Table 3 D:

SUMMARY OUTPUT

<i>Regression Statistics</i>						
Multiple R	0.550884					
R Square	0.303473					
Adjusted R Square	0.249894					
Standard Error	2.281487					
Observations	15					

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	5.783775	1.572104	3.679004	0.002779	2.387452	9.180098
X Variable	0.855249	0.35936	2.379921	0.033313	0.078899	1.6316

Appendix Table 3 E:

SUMMARY OUTPUT

<i>Regression Statistics</i>						
Multiple R	0.014479					
R Square	0.00021					
Adjusted R Square	-0.0767					
Standard Error	2.120645					
Observations	15					

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	8.737472	2.689431	3.248818	0.006343	2.927311	14.54763
X Variable	-0.01399	0.268028	-0.05221	0.959156	-0.59303	0.565045

Appendix Table 3 F:

SUMMARY OUTPUT

<i>Regression Statistics</i>						
Multiple R	0.854991					
R Square	0.731009					
Adjusted R Square	0.710317					
Standard Error	1.719804					
Observations	15					

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	-2.89398	2.321537	-1.24658	0.234546	-7.90936	2.121393
X Variable	2.353292	0.395924	5.9438	4.87E-05	1.497951	3.208634

Appendix Table 3.3.1: Monthly Short-term Interest Rates for the US (FFR) and India (Bank Rate)

Date	US (FFR)	India (Bank Rate)	Differnece US	Difference India
Apr-98	5.45	10.00		
May-98	5.49	9.00	0.04	-1.00
Jun-98	5.56	9.00	0.07	0.00
Jul-98	5.54	9.00	-0.02	0.00
Aug-98	5.55	9.00	0.01	0.00
Sep-98	5.51	9.00	-0.04	0.00
Oct-98	5.07	9.00	-0.44	0.00
Nov-98	4.83	9.00	-0.24	0.00
Dec-98	4.68	9.00	-0.15	0.00
Jan-99	4.63	9.00	-0.05	0.00
Feb-99	4.76	9.00	0.13	0.00
Mar-99	4.81	8.00	0.05	-1.00
Apr-99	4.74	8.00	-0.07	0.00
May-99	4.74	8.00	0.00	0.00
Jun-99	4.76	8.00	0.02	0.00
Jul-99	4.09	8.00	-0.67	0.00
Aug-99	5.07	8.00	0.98	0.00
Sep-99	5.22	8.00	0.15	0.00
Oct-99	5.20	8.00	-0.02	0.00
Nov-99	5.42	8.00	0.22	0.00
Dec-99	5.30	8.00	-0.12	0.00
Jan-00	5.45	8.00	0.15	0.00
Feb-00	5.73	8.00	0.28	0.00
Mar-00	5.85	8.00	0.12	0.00
Apr-00	6.02	7.00	0.17	-1.00
May-00	6.27	7.00	0.25	0.00
Jun-00	6.53	7.00	0.26	0.00
Jul-00	6.54	8.00	0.01	1.00
Aug-00	6.50	8.00	-0.04	0.00
Sep-00	6.52	8.00	0.02	0.00
Oct-00	6.51	8.00	-0.01	0.00
Nov-00	6.51	8.00	0.00	0.00
Dec-00	6.40	8.00	-0.11	0.00
Jan-01	5.98	8.00	-0.42	0.00
Feb-01	5.49	7.50	-0.49	-0.50
Mar-01	5.31	7.00	-0.18	-0.50
Apr-01	4.80	7.00	-0.51	0.00
May-01	4.21	7.00	-0.59	0.00
Jun-01	3.97	7.00	-0.24	0.00
Jul-01	3.77	7.00	-0.20	0.00
Aug-01	3.65	7.00	-0.12	0.00
Sep-01	3.07	7.00	-0.58	0.00
Oct-01	2.49	6.50	-0.58	-0.50
Nov-01	2.09	6.50	-0.40	0.00
Dec-01	1.82	6.50	-0.27	0.00
Jan-02	1.73	6.50	-0.09	0.00
Feb-02	1.74	6.50	0.01	0.00
Mar-02	1.73	6.50	-0.01	0.00

Apr-02	1.75	6.50	0.02	0.00
May-02	1.75	6.50	0.00	0.00
Jun-02	1.75	6.50	0.00	0.00
Jul-02	1.73	6.50	-0.02	0.00
Aug-02	1.74	6.50	0.01	0.00
Sep-02	1.75	6.50	0.01	0.00
Oct-02	1.75	6.50	0.00	0.00
Nov-02	1.34	6.25	-0.41	-0.25
Dec-02	1.24	6.25	-0.10	0.00
Jan-03	1.24	6.25	0.00	0.00
Feb-03	1.26	6.25	0.02	0.00
Mar-03	1.25	6.25	-0.01	0.00
Apr-03	1.26	6.25	0.01	0.00
May-03	1.26	6.00	0.00	-0.25
Jun-03	1.22	6.00	-0.04	0.00
Jul-03	1.01	6.00	-0.21	0.00
Aug-03	1.03	6.00	0.02	0.00
Sep-03	1.01	6.00	-0.02	0.00
Oct-03	1.01	6.00	0.00	0.00
Nov-03	1.00	6.00	-0.01	0.00
Dec-03	0.98	6.00	-0.02	0.00
Jan-04	1.00	6.00	0.02	0.00
Feb-04	1.01	6.00	0.01	0.00
Mar-04	1.00	6.00	-0.01	0.00
Apr-04	1.00	6.00	0.00	0.00
May-04	1.00	6.00	0.00	0.00
Jun-04	1.03	6.00	0.03	0.00
Jul-04	1.26	6.00	0.23	0.00
Aug-04	1.43	6.00	0.17	0.00
Sep-04	1.61	6.00	0.18	0.00
Oct-04	1.76	6.00	0.15	0.00
Nov-04	1.93	6.00	0.17	0.00
Dec-04	2.16	6.00	0.23	0.00
Jan-05	2.28	6.00	0.12	0.00
Feb-05	2.50	6.00	0.22	0.00
Mar-05	2.63	6.00	0.13	0.00
Apr-05	2.79	6.00	0.16	0.00
May-05	3.00	6.00	0.21	0.00
Jun-05	3.04	6.00	0.04	0.00
Jul-05	3.26	6.00	0.22	0.00
Aug-05	3.50	6.00	0.24	0.00
Sep-05	3.62	6.00	0.12	0.00
Oct-05	3.78	6.00	0.16	0.00
Nov-05	4.00	6.00	0.22	0.00
Dec-05	4.16	6.00	0.16	0.00
Jan-06	4.29	6.00	0.13	0.00
Feb-06	4.49	6.00	0.20	0.00
Mar-06	4.59	6.00	0.10	0.00
Apr-06	4.79	6.00	0.20	0.00
May-06	4.95	6.00	0.16	0.00
Jun-06	4.99	6.00	0.04	0.00
Jul-06	5.24	6.00	0.25	0.00
Aug-06	5.25	6.00	0.01	0.00

Sep-06	5.25	6.00	0.00	0.00
Oct-06	5.25	6.00	0.00	0.00
Nov-06	5.25	6.00	0.00	0.00
Dec-06	5.24	6.00	-0.01	0.00
Jan-07	5.25	6.00	0.01	0.00
Feb-07	5.26	6.00	0.01	0.00
Mar-07	5.26	6.00	0.00	0.00

Source: www.rbi.org.in and www.federreserve.gov

Appendix Table 3.3.2: Monthly Key Policy Rates for the US and India

Date	US Key Policy Rate	Indian Key Policy Rate	DifferenceUS	Difference India
Jun-00	6.53	5.00		
Jul-00	6.54	8.00	0.01	3.00
Aug-00	6.50	13.68	-0.04	5.68
Sep-00	6.52	10.63	0.02	-3.05
Oct-00	6.51	8.50	-0.01	-2.13
Nov-00	6.51	8.00	0.00	-0.50
Dec-00	6.40	8.00	-0.11	0.00
Jan-01	5.98	8.00	-0.42	0.00
Feb-01	5.49	7.50	-0.49	-0.50
Mar-01	5.31	7.00	-0.18	-0.50
Apr-01	4.80	6.75	-0.51	-0.25
May-01	4.21	6.50	-0.59	-0.25
Jun-01	3.97	6.50	-0.24	0.00
Jul-01	3.77	6.50	-0.20	0.00
Aug-01	3.65	6.50	-0.12	0.00
Sep-01	3.07	6.50	-0.58	0.00
Oct-01	2.49	6.50	-0.58	0.00
Nov-01	2.09	6.50	-0.40	0.00
Dec-01	1.82	6.50	-0.27	0.00
Jan-02	1.73	6.50	-0.09	0.00
Feb-02	1.74	6.50	0.01	0.00
Mar-02	1.73	6.00	-0.01	-0.50
Apr-02	1.75	6.00	0.02	0.00
May-02	1.75	6.00	0.00	0.00
Jun-02	1.75	6.00	0.00	0.00
Jul-02	1.73	5.75	-0.02	-0.25
Aug-02	1.74	5.75	0.01	0.00
Sep-02	1.75	5.75	0.01	0.00
Oct-02	1.75	5.75	0.00	0.00
Nov-02	1.34	5.50	-0.41	-0.25
Dec-02	1.24	5.50	-0.10	0.00
Jan-03	1.24	5.50	0.00	0.00
Feb-03	1.26	5.50	0.02	0.00
Mar-03	1.25	5.00	-0.01	-0.50
Apr-03	1.26	5.00	0.01	0.00
May-03	1.26	5.00	0.00	0.00
Jun-03	1.22	5.00	-0.04	0.00
Jul-03	1.01	5.00	-0.21	0.00

Aug-03	1.03	5.00	0.02	0.00
Sep-03	1.01	5.00	-0.02	0.00
Oct-03	1.01	4.50	0.00	-0.50
Nov-03	1.00	4.50	-0.01	0.00
Dec-03	0.98	4.50	-0.02	0.00
Jan-04	1.00	4.50	0.02	0.00
Feb-04	1.01	4.50	0.01	0.00
Mar-04	1.00	4.50	-0.01	0.00
Apr-04	1.00	4.50	0.00	0.00
May-04	1.00	4.50	0.00	0.00
Jun-04	1.03	4.50	0.03	0.00
Jul-04	1.26	4.50	0.23	0.00
Aug-04	1.43	4.50	0.17	0.00
Sep-04	1.61	4.50	0.18	0.00
Oct-04	1.76	4.50	0.15	0.00
Nov-04	1.93	4.50	0.17	0.00
Dec-04	2.16	4.75	0.23	0.25
Jan-05	2.28	4.75	0.12	0.00
Feb-05	2.50	4.75	0.22	0.00
Mar-05	2.63	4.75	0.13	0.00
Apr-05	2.79	5.00	0.16	0.25
May-05	3.00	5.00	0.21	0.00
Jun-05	3.04	5.00	0.04	0.00
Jul-05	3.26	5.00	0.22	0.00
Aug-05	3.50	5.00	0.24	0.00
Sep-05	3.62	5.00	0.12	0.00
Oct-05	3.78	5.00	0.16	0.00
Nov-05	4.00	5.25	0.22	0.25
Dec-05	4.16	5.25	0.16	0.00
Jan-06	4.29	5.50	0.13	0.25
Feb-06	4.49	5.50	0.20	0.00
Mar-06	4.59	5.50	0.10	0.00
Apr-06	4.79	5.50	0.20	0.00
May-06	4.95	5.75	0.16	0.25
Jun-06	4.99	5.75	0.04	0.00
Jul-06	5.24	5.75	0.25	0.00
Aug-06	5.25	6.00	0.01	0.25
Sep-06	5.25	6.00	0.00	0.00
Oct-06	5.25	6.00	0.00	0.00
Nov-06	5.25	6.00	0.00	0.00
Dec-06	5.24	6.00	-0.01	0.00
Jan-07	5.25	6.00	0.01	0.00
Feb-07	5.26	6.00	0.01	0.00
Mar-07	5.26	6.00	0.00	0.00

Source: www.rbi.org.in and www.federalreserve.gov

Note: In both the tables 3.3.1 and 3.3.2, the third and the fourth columns, i.e. Difference US and Difference India represent the differences that have been obtained by subtracting the value of interest rate in a particular month from that in the immediately following month respectively for the two countries concerned.

Appendix Table 3.3.A:

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.611591
R Square	0.374044
Adjusted R Square	0.368139
Standard Error	0.845051
Observations	108

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	5.604538	0.178113	31.46614	1.38E-55	5.251411	5.957665
X Variable	0.347891	0.043712	7.958704	2.05E-12	0.261228	0.434555

Appendix Table 3.3.B:

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.62913
R Square	0.395805
Adjusted R Square	0.388252
Standard Error	1.105061
Observations	82

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	4.299999	0.239323	17.96738	8.22E-30	3.823731	4.776266
X Variable	0.477775	0.065997	7.239304	2.45E-10	0.346436	0.609114

CHAPTER 4
FINANCE FLOWS AND INTEREST RATES

Section 4.1: Two Aspects of the Mundell- Fleming Analysis

The Mundell-Fleming model on international capital flow suggests that a permanent interest-rate difference causes a permanent capital flow. The Mundell-Fleming model, however, has two aspects, one of which deals with the adjustment mechanism and the other one talks about the equilibrium situation. The question of adjustment arises when the prevailing level of interest rate in any country is different from the rate prevailing at the international level, thus resulting in either an inflow or an outflow of capital. As long as this difference persists, the inward or outward, as the case may be, movement of interest rate continues. This movement, according to Mundell and Fleming has the equilibrating impact, so that after a point the interest rate differential gets eliminated completely thus equalizing the domestic and the international rates of interests. This is the adjustment aspect. Finally when the interest rates are completely equalized, then the equilibrium is attained.

In the Mundell-Fleming framework, monetary policy is assumed to take the form of open market purchases of securities. Floating exchange rates result when the monetary authorities do not intervene in the exchange market, and fixed exchange rates when they intervene to buy and sell international reserves at a fixed price.

While discussing the adjustment mechanism in the Mundell-Fleming framework, for the sake of better understanding, a distinction has been made between conditions of sectoral and market equilibria. There is a set of sectoral restraints which show how expenditure in each sector of the open economy is financed: a budget deficit in the government sector is financed by an increase in the public debt or a reduction in government cash balances (dishoarding); an excess of investment over saving in the private sector is financed by net private borrowing or a reduction in privately-held money balances; a trade balance deficit in the foreign sector is financed by capital imports or a reduction in international

reserves; and finally an excess of purchases over sales of domestic assets of the banking sector is financed by an increase in the monetary liabilities of the banking system (money supply) or by a reduction in foreign exchange reserves. For simplicity it had been assumed that there is, initially, no lending between the sectors.

There is also a set of market restraints which refer to the condition that demand and supply of each object of exchange be equal. The goods and services market is in equilibrium when the difference between investment and saving is equal to the sum of the budget surplus and the trade balance deficit. The capital market is in equilibrium when foreigners and domestic banks are willing to accumulate the increase in net debt of the government and the public. The foreign exchange market is in equilibrium when the community is willing to accumulate the increase in the money supply offered by the banking system.

Two separate cases have been considered, one with a flexible exchange rate regime and the other with a fixed exchange rate regime. Under flexible exchange rates no central bank intervention takes place in order to fix a given exchange rate, although it does not need to rule out autonomous purchases and sales of foreign exchange. An increase in bank reserves, a multiple expansion of money and credit, and downward pressure on the rate of interest result from an open market purchase of domestic securities in the context of a flexible exchange rate system. But an outflow of capital prevents the interest rate from falling, which causes a deficit in the balance of payments, and a depreciation of the exchange rate. In turn, the exchange rate depreciation (normally) improves the balance of trade and stimulates, by the multiplier process, income and employment. A new equilibrium is established when income has risen sufficiently to induce the domestic community to hold the increased stock of money created by the banking system. Unchanged interest rates imply that income must rise in proportion to the increase in the money supply, the factor of proportionality being the given ratio of income and money (income velocity).

In the new equilibrium, as a consequence of the increase in income, the private saving and taxes will have increased, and this implies both net private lending and retirement of government debt. Equilibrium in the capital market then requires equality between the sum of net private lending plus debt retirement, and the rate of capital exports, which together with the requirement of balance of payments equilibrium, implies a balance of trade surplus. "Monetary policy therefore has a strong effect on the level of income and employment, not because it alters the rate of interest, but because it induces a capital outflow, depreciates the exchange rate, and causes an export surplus."⁶⁴

The central bank operations in the foreign exchange market ("open market operations" in foreign exchange) can be considered an alternative form of monetary policy. If the central bank buys foreign reserves (gold or foreign currency) with domestic money, that increases bank reserves, causing a multiple expansion of the money supply. The monetary expansion puts a downward pressure on the interest rate and induces a capital outflow, further depreciating the exchange rate and creating an export surplus, which in turn, through the multiplier effect, raises income and employment. Eventually, when income has increased sufficiently to induce the community to hold increased stock of money, the income generating process ceases and all sectors are again in equilibrium, with the increased saving and taxes financing the capital outflow. This conclusion is quite similar to the earlier conclusion regarding monetary policy, with the single important difference that foreign assets of the banks are increased in the case of foreign exchange policy while domestic assets are increased in the case of monetary policy. Foreign exchange policy, like monetary policy, becomes a forceful tool of stabilization policy under flexible exchange rates.

Under fixed exchange rates the central bank intervenes in the exchange market by buying and selling reserves at the exchange parity; the exchange rate margins are assumed to be zero. A central bank purchase of securities creates excess reserves and puts downward pressure on the interest rate. But a fall in the interest rate is prevented by a capital

⁶⁴ Mundell (1963)

outflow, and this worsens the balance of payments. To prevent the exchange rate from falling, the central bank intervenes in the market, selling foreign exchange and buying domestic money. The process continues until accumulated foreign exchange deficit is equal to the open market purchase and money supply is restored to its original level.

This shows that monetary policy under fixed exchange rates has no sustainable effect on the level of income. The increase in the money supply arising from open market purchases is returned to the central bank through its exchange stabilization operations. What the central bank has in fact done is to purchase securities initially for money, and then buy money with foreign exchange, the monetary effects of the combined operations canceling. The only final effect of the open market purchase is an equivalent fall in foreign exchange reserves: the central bank has simply traded domestic assets for foreign assets.

Coming to the special case of sterilization (or neutralization) policy, which is a specific combination of monetary and exchange policy, when the central bank buys or sells foreign exchange the money supply increases or decreases, and the purpose of sterilization policy is to offset this effect. The mechanism is for the central bank to sell securities at the same rate that it is selling foreign exchange. In reality, therefore, neutralization policy involves an exchange of foreign reserves and bonds. The exchange rate is stabilized by buying and selling reserves in exchange for securities.

Now, if the government increases spending during a time when neutralization policy is being followed, the increase in spending would normally have a multiplier effect on income. But that would enhance the demand for money and put upward pressure on interest rates as the private sector dispenses with holdings of securities; this would cause a capital inflow and induce a balance of payments surplus. But in their rate-pegging operation, the authorities buy foreign exchange and simultaneously sell securities, thus putting added pressure on interest rates and accelerating the inflow of capital without satisfying the increased demand for money. An inconsistency in the system will therefore result, because the goods market equilibrium requires an increase in income, but an

increase in income can only take place if either the money supply expands or the interest rates rise. The capital inflow prevents interest rates from rising and the neutralization policy inhibits the money supply from expanding. Either the money supply or the exchange rate has to change in order to regain consistency. If the central bank sells securities at the same rate as it is buying reserves, it cannot buy reserves at a rate fast enough to keep the exchange rate appreciating. If the central bank, however, buys reserves at a rate fast enough to stabilize the exchange rate, it cannot sell securities fast enough keep the money supply constant. Either the exchange rate appreciates or money income rises.

Section 4.2: Adjustment Part of the Story as observed for India

To observe the adjustment aspect of the Mundell-Fleming analysis empirically, i.e. to check for how the level of capital inflow is affecting the prevailing level of interest rates, two random regression exercises have been conducted. The first regression takes the annual level of FDI into India as the dependent variable and the difference between the long-term interest rate in India and that in the US as the explanatory variable with the data from 1991-92 to 2005-06. Here, it needs to be mentioned that the foreign direct investors do not take into account the long-term rate of interest as a major factor while making investment decisions, rather they consider other long-term factors concerning the economic prospects of a country. Nonetheless, as an experiment, just to find out whether any relationship exists between the level of FDI and the interest rate differential, such a regression exercise has been performed. For India, the representation for long-term interest rate is usually the interest rates on the government securities with a maturity period of 10 years have been taken into account as a representation for the long-term interest rate. Now for the years 2004-05 and 2005-06, the yield in percentage terms for the securities with a maturity period of 10 years is nil, so for the years 2004-05, the percentage yield on government securities with a maturity period of 9 years have been considered and for the year 2005-06, the percentage yield on the government security with a maturity period of 10 years and 10 months have been taken as the representation (since these two are the closest approximation for 10 years). For the US, the annual rates

of interest on government securities with a maturity period of 10 years have been taken to be the representation for the long-term rate. The regression results have been given in the appendix 4.A.

The following Table 4.2.1 shows the annual values of the long-term interest rates for US and India along with their differences and the annual levels of FDI.

Table 4.2.1: FDI and Long-term Interest Rates in India and the US

Year	Long-term Rate of Interest for US (1)	Long-term Rate of Interest for India (2)	FDI(US \$ million)	Difference [(2)-(1)]
1991-92	7.86	12.75	129	4.89
1992-93	7.01	12.75	315	5.74
1993-94	5.87	13.40	586	7.53
1994-95	7.09	12.35	1314	5.26
1995-96	6.57	13.75	2144	7.18
1996-97	6.44	13.65	2821	7.21
1997-98	6.35	13.05	3557	6.70
1998-99	5.26	12.13	2462	6.87
1999-00	5.65	11.69	2155	6.04
2000-01	6.03	11.30	4029	5.27
2001-02	5.02	9.39	6130	4.37
2002-03	4.61	7.43	5035	2.82
2003-04	4.01	5.32	4673	1.31
2004-05	4.27	5.47	5535	1.20
2005-06	4.29	5.32	7751	1.03

Source: RBI Annual Reports, Various Issues and Federal Funds Reserve Database

The results of the regression (Appendix.4.A), i.e. the one with the annual levels of FDI inflow into India as the dependent variable and the difference between the long-term interest rate in India and that in the US as the explanatory variable, give us a negative coefficient of the explanatory variable which is significant at 5 per cent level thus suggesting that there exists a negative relationship between the two. The respective approximate values of R^2 and adjusted R^2 are 0.52 and 0.49. The line fit plots are shown in the following Figure 4.2.1.

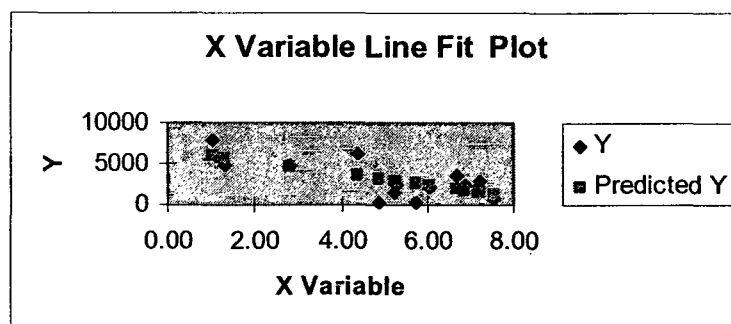


Figure 4.2.1

The next regression takes FPI as the dependent variable and the difference between the annual average short-term key policy rates for India and the US as the explanatory variable. The result of this regression exercise has been presented in the appendix 4.B. The following Table 4.2.2 shows the annual values of the short-term interest rates for India and the US along with their annual differences and the level of FPI in India. For the US, the annual average values of the Federal Funds Rate or FFR has been taken to be the representation for the annual short-term rate during 1991-92 to 2005-06. For India, the annual average values of the Bank Rate have been taken to be the representation for the annual short-term rate during the same period.

Table 4.2.2: FPI and Key Policy Rates in India and the US

Year	FPI (in US \$ million)	Key Policy Rates for India	Key Policy Rates for US	Difference
1991-92	8	12.00	5.69	6.31
1992-93	92	12.00	3.52	8.48
1993-94	3490	12.00	3.02	8.98
1994-95	3581	12.00	4.21	7.79
1995-96	2748	12.00	5.83	6.17
1996-97	3312	12.00	5.30	6.70
1997-98	1828	9.50	5.46	4.04
1998-99	-61	8.08	5.35	2.73
1999-00	3026	7.92	4.97	2.95
2000-01	2760	7.44	6.24	1.20
2001-02	2021	6.42	3.88	2.54
2002-03	979	5.58	1.67	3.91
2003-04	11377	4.71	1.13	3.58
2004-05	9315	4.23	1.35	2.88
2005-06	12492	5.21	3.22	1.99

Source: RBI Annual Reports, Various Issues and Federal Funds Reserve Database

The regression exercise (results presented in Appendix. 4.B), however, shows no significant relationship between the level of FPI in India and the annual differences between the levels of short-term key policy rates for India and the US.

Both these regression results, however, are not in line with the adjustment proposition prescribed in the Mundell-Fleming model. For the first regression a negative relationship has been observed between the annual levels of FDI and the differences in the long term interest rates for the US and India. For the second regression, no significant result could be obtained. As far as the adjustment aspect of the Mundell-Fleming model is concerned, both these results would have ideally shown a significantly positive relationship between the level of foreign investment and the level of the interest rate differential. Therefore, it can be inferred from here that the inflow of foreign capital is failing to eliminate the differences between the Indian and the US interest rates, contrary to the predictions of the Mundell-Fleming model.

Section 4.3: Interest Rate Policies and Capital Flows

The regressions conducted, however, do not provide expected results because of two probable reasons. First, the interest rates considered here are not the market determined rates, rather they are the results of government intervention. In India the Reserve Bank of India is the interest rate determining authority, which fixes the interest rate, as elaborated in chapter 3 of this thesis, in line with the interest rate in the US. The Indian interest rate is always kept aligned to that of the US with the anticipation that a mismatch might cause a capital flight. So it may be the case that the equilibrating mechanism taking place through the interplay of the market forces, discussed in the Mundell-Fleming analysis fails to hold good in this case because of this government intervention. Second, since the government intervention in the determination of the interest rates policy assumes a more or less predictable nature, therefore, the speculators may start to anticipate the moves of the government regarding interest rate determination. As a result, even when there is an increase in the level of rate of interest following a policy decision by the government, the speculators or investors may decide not to switch their funds immediately to that country.

Hence the regression results here are not meant to suggest that the adjustment mechanism as suggested by the Mundell-Fleming model is nonexistent, but rather the relationship underlying the adjustment mechanism may not be statistically observable in reality due to government interventions in the determination of interest rates.

APPENDICES TO CHAPTER 4:

Appendix 4.A:

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.714347
R Square	0.510292
Adjusted R Square	0.472622
Standard Error	1648.178
Observations	15

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	6717.444	1035.639	6.486282	2.05E-05	4480.083	8954.805
X Variable	-709.965	192.8968	-3.68055	0.002771	-1126.69	-293.237

Appendix 4.B:

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.248189
R Square	0.061598
Adjusted R Square	-0.01059
Standard Error	4026.447
Observations	15

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	6133.061	2733.351	2.243788	0.042896	228.0153	12038.11
X Variable	-449.364	486.4507	-0.92376	0.37244	-1500.28	601.5489

CHAPTER 5

CONCLUSION

Section 5.1: A Brief Recapitulation of the Earlier Chapters

India has experienced greater degree of integration with the global economy during the post liberalization years. The focus of this thesis is on the impact of liberalization on Indian interest rate policy. Chapter 1 of this thesis, therefore, has provided a theoretical framework for interest rate determination in an economy with free financial flow. Chapter 2 has elaborated on the components of foreign capital inflow into India, followed by the debates on capital account convertibility. Chapter 3 has established a connection between the interest rate policies of India and the US. Chapter 4 has discussed about the link between inflows of foreign finance and interest rates in context of India. With the perspective that we get from all these discussions, certain further observations emerge as discussed in the following sections of this chapter.

Section 5.2: Lack of Level Playing Field

The developing countries increasingly resort to liberalization of their capital accounts with an eye to enhancing foreign capital inflows. For this same purpose the monetary policy determining authorities in these countries set interest rates at high levels, at least higher than those prevailing in their developed counterparts, as elaborated in the earlier chapters. Thus what emerges is that there is a serious lack of level playing field, in the sense that, the US dollar still continues to be the “dominant” reserve currency for almost all other countries, and therefore the US still keeps dictating the terms and conditions in the international financial market.

Section 5.3: Capital Account Convertibility

Capital account liberalization essentially provides freedom from prohibitions on transactions in the capital and financial accounts of the balance of payments. The approach of the multilateral institutions like the IMF has been in favour of greater

liberalization of the capital account in order to facilitate larger inflow of capital into the developing countries. Prior to the East Asian financial crisis (1997), the IMF generally discouraged tightening of controls over capital movements in response to large capital flows and encouraged adjustments in fiscal, monetary and exchange rate management. An implicit assumption was that financial markets are usually efficient in deciding the right amount and composition of capital flows into a country. Such an assumption basically hinges on the idea that the financial markets possess adequate autonomy to decide about the direction and volume of capital flows. The discussions in the previous chapters of this thesis have clearly established that the autonomy of financial market, particularly in a developing country, is a myth. Financial flows do not take place as a result of free play of the market, but rather government or central bank always intervenes to ensure that foreign finance would flow in or at least no capital would flow out of the country. So the assumption of a very efficient financial market capable of deciding the right amount or composition of capital flows at its very root is weak.

When there is capital account convertibility, the interest rate policies of the government or the central bank is so designed as to prevent capital flight aided by stock market boom. But such a structure is essentially fragile and cannot have a sustainable impact on capital inflow. This is because however much the government tries to assure the foreign investors, the activities of the speculators in the stock markets at any point of time might lead a situation called “self-fulfilling prophecy”. Such a situation occurs when, suddenly without any proper economic reason, the speculators start to believe that the currency of a particular country will depreciate. Therefore, they convert all their assets held in the form of the domestic currency of that country into the form of foreign currency. Following this there is a sudden excess supply of the domestic currency and the excess demand for foreign currency. As a result the domestic currency depreciates and the prophecy comes out to be true. So despite the governments or central bank designing interest rate policies by fixing high levels of interest rate, so as to attract foreign capital does not really ensure that they will succeed in doing so. This case was empirically observable during the East Asian financial crisis in 1997.

Section 5.4: A Digression on East Asian Experience

The East Asian Financial Crisis, that had hit several economies in South-East Asia in 1997, came as a surprise, because was during the three preceding decades of the crisis, East Asia had not only grown remarkably fast, but also had fared much better at reducing poverty than any other region of the world, developed or less developed, but it had also been more stable. It had been able to save itself from the ups and downs that characterize almost every market economy. Its remarkably impressive performance led it to be widely described as “East Asia Miracle”⁶⁵. The report of a study on these economies, undertaken by the World Bank (under pressure from the Japanese, who had also offered to pay for it), whose final report was titled *The East Asian Miracle*, identified the important role that the governments of these countries had played in promoting such an impressive growth prospect. The principal propelling force behind the miraculous growth of these East Asian economies had the high amount of savings and heavy investments. But the most crucial point to be noted here is that the Government policies in these economies had played an important role in enabling them in accomplishing both the goals at the same time. And this role was so effective that no other set of countries across the world had ever been able to manage to save at such high rates and invest funds so well. Moreover, the combination of high savings rates, government investment in education, and state-directed industrial policy all served to make the region an economic powerhouse⁶⁶. Their growth rates remained quite phenomenal for decades, for tens of millions of people experienced as enormous enhancement in their living standards. The benefits of growth were shared widely. Although the way the Asian economies developed was not free from problems, but overall, the governments had been successful in devising a strategy that had worked so well.

The crisis, however, was largely a result of excessively rapid financial and capital market liberalization, though mistaken policies on the part of the countries themselves had also played a role⁶⁷. The essential feature of a currency crisis consists of the loss of investors’

⁶⁵ Stiglitz, 2002, pp. 90

⁶⁶ Stiglitz (2002), pp.92

⁶⁷ Stiglitz (2002), pp.89

confidence in the balance of payments viability of a country and the consequent apprehension that there is going to be a sharp depreciation of the country's currency in the near future⁶⁸.

The problem of the East Asian economies had been that investment decisions were driven by unduly enthusiastic expectations, based as they were on "extrapolation of past trends into the future"⁶⁹, especially with respect to export demand. Such high levels of export oriented investment in emerging economies in general, and the East and South-East Asian economies in particular, reflected co-ordination failure, characteristic of the free market solution, and paved the way for deceleration of export growth in high performing economies in Asia. The currency crisis as a fallout of the deceleration could have been avoided, had the countries not permitted large scale financing of long-term investments with short-term external loans without any forward cover, allowed substantial foreign funds to flow into their capital markets, and maintained foreign exchange reserves totally inadequate in relation to international 'hot money' held in the domestic financial system.

The most important observation to be made about the East Asian experience is that, under capital account convertibility and free play of market forces, strong fundamentals not necessarily make a country immune to currency crises, and actually it did not in the East Asian context.

Usually countries follow a tight money policy in order to counter speculative attacks on their currencies, with the expectation that investors will consider their domestic assets more attractive than those of the other countries which is likely to lead to an inflow of foreign funds and a tendency for appreciation of domestic currency. But so far as the East Asian experience is concerned, the enhancement in the levels of interest rates could hardly be expected to induce inflow of foreign funds, "unless the global fund managers were to reallocate their portfolios in favour of Asia at the expense of other markets"⁷⁰. Such a switch is not likely to occur simply because of the fact that when a debtor already

⁶⁸ Rakshit (2002), pp.63

⁶⁹ Rakshit (2002), pp.160

⁷⁰ Rakshit (2002), pp.112

faces difficulties in honouring his obligations, willingness to pay higher interest rates do not help in securing loans. In fact, higher interest rates in such a situation might very well undermine the lenders' confidence in the viability of both the economy and specific projects to be financed.

Section 5.5: Implications of Capital Account Convertibility for India

The Report of the Committee on Capital Account Convertibility (Chairman: S.S. Tarapore), submitted in May, 1997, provided the framework for liberalization of capital account in India. The Committee recommended a phased implementation of Capital Account Convertibility (CAC) in India and prescribed the macroeconomic framework for implementing full convertibility in terms of the preconditions for greater liberalization. Where there is no formal definition of CAC, the Committee recommended a working definition for purpose of its report. CAC refers to the freedom to convert local financial assets into foreign financial assets and vice versa at market determined rates of exchange. It is associated with changes of ownership in foreign/domestic financial assets and liabilities and embodies the creation and liquidation of claims on, or by the rest of the world. India is thus talking about gradual convertibility of the capital account. This gradualist approach basically concerns the pace of the reform measures without any consideration for the desirability of such a measure. But the basic question that still remains to be answered is that whether full convertibility of the capital account is desirable or not. The East Asian experience of the late 1990s suggests that the answer cannot clearly be in the affirmative.

Glossary:

ADR: American Depository Receipt

ADS: American Depository Shares

CPIS: Coordinated Portfolio Investment Survey

EME: Emerging Market Economies

FC(B&O)D: Foreign Currency (Bank and Others) Deposit Scheme

FCCB: Foreign Currency Convertible Bonds

FCNRA: Foreign Currency Non-Resident Rupee Account

FCNR(B): Foreign Currency (Non-Resident) Accounts (Banks)

FCON: Foreign Currency (Ordinary) Non-Repatriable Deposit

FDI: Foreign Direct Investment

FII: Foreign Institutional Investment

FIIA: Foreign Investment Implementation Authority

FIPB: Foreign Investment Promotion Board

FPI: Foreign Portfolio Investment

GDR: Global Depository Receipt

IMF: International Monetary Fund

IRDA: Insurance Regulatory and Development Act

MNC: Multinational Corporations

NR(E)RA: Non-Resident External Rupee Accounts

NRI: Non-Resident Indians

NRNR: Non-Resident (Non-Repatriable) Deposit

NR(NR)RD: Non-Resident (Non-Repatriable) Rupee Deposit Scheme

NR(S)RA: Non-Resident (Special) Rupee Account

OCB: Overseas Corporate Bodies

ODB: Overseas Depository Bank

RBI: Reserve Bank of India

RIB: Resurgent India Bonds

SEBI: Securities and Exchange Board of India

SEFER: Securities held as Foreign Exchange Reserve

SIA: Secretariat for Industrial Approval

SSIO: Survey of Geographical Distribution of Securities held by International Organizations

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