A lot of research has already been done across the globe analyzing the impact of capital flows on economic growth, stock market, exchange rate, productivity and employment. But, there are very few studies which really explore the impact of sudden declines of capital inflows on various macroeconomic variables, especially in the Indian context. Brief review of related literature on the present study is given in this chapter.

To probe the problem at hand in an efficient and effective manner, the review of existing and related literature is very important. In the word of Walter R. Brog, “the literature in any field forms the foundation upon which all future work will be built”. If researcher fails to build this foundation of knowledge provided by the review of literature, work is likely to be shallow and waive and will often duplicate work that has already been done better by someone else. Thus, the review of literature justifies the study, checks the repetitive research work on the same subject matter, eliminates the chances of academic privacy and gives the researchers an understanding of what still remain to be done in the area of subject under the study. Therefore, keeping in view the importance of review of related literature, the researcher’s attempt here was to review the available literature on the subject under study.

Most academic economists believe that the surge in cross-border capital flows since the early 1990s has created unprecedented opportunities for developing countries to achieve accelerated economic growth. International financial institutions routinely advise developing countries to adopt policy regimes that encourage capital inflows. A large majority of the developing countries have substantially reduced restrictions on capital inflows, and some have proceeded to offer substantial incentives in the form of tax concessions or subsidies to international investors (Ghose, 2004). Differences in human capital (Lucas, 1990), in the risk of sovereign default (Reinhart and Rogoff, 2004), in capacity to use technologies (Eichengreen, 2003), and in institutional quality (Alfaro et al., 2008) seem to be relevant for the direction of cross-border net capital flows. Obstfeld and Taylor (2005) showed that during the 1990s, net capital flows to poor countries remained relatively small, while gross capital flows, in general, were large, in particular among advanced economies. This, they argued, was evidence that portfolio diversification, not development finance, was the main factor driving financial integration. Rangrajan (2000) investigated the capital flows and its impact on the capital formation and economic growth taking into the variable as net private capital flows, net direct investment, net official flows, net portfolio investment and other net investments in
22 countries during 1992 to 2000. If capital inflows were volatile or temporary, the country would have to go through an adjustment process in both the real and financial market. Inflows, which take the form of direct foreign investment, are generally considered more permanent in character. Capital flows can be promoted purely by external factors which may tend to be less sustainable than those induced by domestic factors. Both capital inflows and outflows when they are large and sudden have important implication for economies. When capital inflows are large, they can lead to an appreciation of real exchange rate. He concludes that the capital account liberalization is not a discrete event.

Lensik et al. (1999) examined the impact of uncertain capital flows on the growth of 60 developing countries during the 1990’s. They distinguished between total capital flows, official capital flows and private capital flows. For the three types of capital flows, they derived a yearly uncertainty measure. They have used the yearly uncertainty measures in Ordinary Least Square (OLS) as well as Generalized Method of Moments (GMM) estimates, to explain the impact of uncertain capital flows on growth. They conclude that both types of estimates suggest that uncertain capital flows have a negative effect on financial market and growth in developing countries. Mohamed (2003) examined the effect of foreign capital inflow on savings, investment and economic growth rate in Egypt. Regression results showed that foreign capital inflow has a significant positive effect on savings and investment and in turn on the economic growth rate. Research also indicates that while foreign capital is a partial substitute for domestic savings.

Adhikary (2011) examined the linkage between FDI, trade openness, capital formation, and economic growth rates in Bangladesh over a period 1986 to 2008 using time series analysis. All variables are found stationary at first differencing both at constant and constant plus trend level under the ADF and PP stationary tests. The Johansen-Juselius procedure is applied to test the cointegrating relation between variables followed by a vector error correction model. The empirical results trace a strong long-run equilibrium relationship between GDP growth rates and the explanatory variables with unidirectional casual flows. The volume of FDI and level of capital formation are found to have significant positive effect on changes in real GDP. The degree of trade openness unleashes negative but diminishing influence on GDP growth rates. The study conclude that Bangladesh should formulate FDI-led polices and ensure higher degree of capital formation to enhance her economic growth rates at large. Sethi (2007) studied the impact of international capital flows on economic growth in view of changing India’s financial markets. The study also examines trends and composition of capital inflows, changing pattern capital flows in view of economic reform, ascertain the impact of domestic financial policy variables on international capital flows and suggest policy implication thereof. By using monthly time series data, we found that Foreign Direct Investment
FDI is positively affecting the economic growth direct contribution, while Foreign Institutional Investment (FII) is negatively affecting the growth alb its, in a small way and make a preliminary attempt to test whether the international capital flows has positive impact on financial markets and economic growth. The empirical analysis using the time series data between April 1995 to April 2007 shows that FDI plays unambiguous role in contributing to economic growth. Ritter (2003) examines the role of nominal exchange rate in correcting a real exchange rate misalignment triggered by a negative swing in capital inflows is examined. In particular, price and quantity effects stemming from real exchange rate adjustment under a flexible exchange rate regime are contrasted with the adjustment under a fixed exchange rate agreement. He also examined the impact on the adjustment paths of different degrees of responsiveness of demand for traded and non-traded goods to changes in the real exchange rate and domestic absorption is clarified.

Ahmad et. al. (2009), examined the behavior of some macroeconomic variables in response to total capital inflows in India using quarterly data for the period 1994 (Q1)-2007 (Q4). Time trend of all variables except nominal effective exchange rate- both export and trade based and current account balances shows instability over the period of study. Current account balance is the only variable which is stationary in level form all other variables are stationary in first difference form. Co integration test confirms the long run equilibrium relation between total capital inflows (TCI) and real effective exchange rate- both trade based and export based and between TCI and nominal effective exchange rate-export based. Granger causality test confirms the bidirectional causality between real effective exchange rate-export based and TCI and between foreign exchange reserve & TCI and unidirectional causality from TCI to real effective exchange rate- traded based. Balamurti and Bogahawatte (2004) examined the relationship between foreign direct investment and economic growth of Sri Lanka for the period 1977-2003 using Johansen’s full information maximum likelihood method by considering relationship between real gross domestic product, foreign direct investment, domestic investment and openness of the trade policy regime. The results indicate that foreign direct investments exert an independent influence on economic growth and there is bidirectional causality between foreign direct investment and economic growth. The finding suggests that better trade policy reforms, implementation aimed at promoting foreign direct investment and domestic investment, and restoring international competitiveness to expand and diversify the country’s exports have the potential of accelerating economic growth in the future.

Chakraborty (2003) using VAR model for the period 1993(Q2) to 2001(Q4) concluded that unlike East Asian and Latin American countries, the real exchange rate depreciates with respect to one standard deviation innovation to capital inflows. The paper argues
that monetary policy was effective in avoiding any serious distortion in the real exchange rate. Dua and Sen (2006) while analyzing the relationship between the real exchange rate, level of capital flows, volatility of the flows, fiscal and monetary policy indicators and current account surplus for the period 1993Q2 to 2004Q1 concluded that variables are co-integrated and each Granger causes the real exchange rate. The generalized variance decomposition shows that determinants of the real exchange rate in descending order of importance include net capital inflows and volatility (jointly), government expenditure, current account surplus and the money supply. Khanna (2002) examined the macroeconomic effects of foreign capital during 1989 to 2002. He took the macro variable as FDI, FPI, NRI deposits, external assistance and GDP/GDS/GNP. He tells that entry of international capital flows helps to provide greater depth to the domestic capital market and reduce the systematic risk of the economy. He argues that advanced for liberalizing capital market for liberalizing capital market and opening them to foreign investor are to increase the availability of capital with domestic industries and commercial firms. On the other hand, the Indian stock market is today largely dominated by a small group of FII’s, are able to move the market by large intervened. He concludes that in case of India, the microanalysis of stock market also fails to provide any evidence that the entry of FII has reduced the cost of Indian corporate sector.

RBI Governor, D. Subbaro (2010), in an interview said that Capital inflows are comfortable so far as our absorptive capacity has increased. He also said that the rising capital inflows are helping India finance the CAD (current account deficit) right now.

Examining India’s experience with capital inflows, Shah and Patnaik (2004) discussed India’s policies towards capital flows in the last two decades. They pointed out that since the early nineties India has implemented policies aimed at liberalizing trade deregulating investment decisions. Throughout most of this period India’s has maintained strong controls on debt flows and has encouraged FDI and portfolio flows. At the same time the Indian authorities have adopted a pegged nominal exchange rate. According to them, domestic institutional factors have resulted in a relatively small FDI and large portfolio flows. They also observed that one of India’s most severe policy dilemmas during this period has been related to the tension between capital flows and currency regime. Jha (2003) made an attempt to study the recent trends in FDI flows in India. He found that FDI flows to India have not been commensurate with her economic potential and performance. With FDI becoming a significant component of investment recently, accounting practices in India lagged behind international norms. However, the government of India revised its computation of FDI figures in line with the best international practices, which has lead to a substantial improvement in FDI figures. The author however says that the quality of FDI as a manifest in technological spillovers, export performance etc. is more important than its quantity. Carkovich and Levine (2002)
concluded that an economic rationale for treating foreign capital favorably is that FDI and portfolio flows encourage a technology transfer that accelerates that overall economic growth of the recipients’ countries. While micro economic studies give a pessimistic view of growth effect of foreign capital, macroeconomic studies find a positive link between FDI and growth. However the author says that previous macroeconomic studies do not fully control for endogeneity, country specific effect and inclusion of lagged dependent variables in the growth regression. After reducing many statistical problems plaguing past macroeconomic studies and using two new data bases, they find that FDI inflows do not exert an independent influence on economic growth. Thus while sound economic policies may spur both growth and FDI, the results are inconsistent with the view that FDI exerts a positive impact on growth that is independent on the other growth determinants.

Clark and Berko (1997) emphasized the beneficial effects of allowing foreigners to trade in stock markets and outline the “base-broadening” hypothesis. The perceived advantages of base-broadening arise from an increase in the investor base and the consequent reduction in risk premium due to risk sharing. Other researchers and policy makers are more concerned about the attendant risks associated with the trading activities of foreign investors. They are particularly concerned about the herding behavior of foreign institutions and the potential destabilization of emerging stock markets. Sudershan (2007) in his thesis made an attempt to examine the impact of FDI inflows on financial performance and export performance of select pharmaceutical companies and the financing pattern of FDI and Non-FDI based select pharmaceutical companies. The study is conducted for a period of 15 years i.e. from 1991 to 2005 and the data analysis is done using both traditional methodologies, such as common size statements, trend analysis and ratio analysis and econometric modeling such as pooled cross section time series analysis or panel data analysis. Based on the results, the study reveals that higher proportion of FDI will result into better performance of companies. As far as export performance is concerned, the performance of FDI based pharmaceutical companies in India.

Singh (1997) argued that portfolio capital was recommended to developing countries for being less vulnerable to external interest rate shocks than debt. However, in practice these inflows can be destabilizing to the real economy if external financial liberalization is carried out in 'disequilibrium' conditions in the economy. Since the structural characteristics of developing countries makes them subject to more external and internal shocks than advanced economies, many of these unfavorable outcomes are likely to prevail even under 'normal' conditions, and even if there were a correct 'sequencing' of financial reforms. Stiglitz (2000) offers insights into the financial crisis of 90’s as well as on other recent crises, including Russia and Latin America. He suggests that premature financial and capital market liberalization was at the root of these crises. He also suggests
that global economic arrangements are fundamentally weak. His analysis of why capital market liberalization produces instability, not growth, identifies the following fallacy in the pro-liberalization arguments, namely that ‘financial and capital markets are essentially different from markets for ordinary goods and services’28. He also argued that capital flows are pro-cyclical; therefore the argument that the opening of capital markets would allow diversification and enhance stability is deficient. Finally, he challenges the notion that any destabilizing effects emanating from capital account liberalization are transitory, while the benefits are permanent, by alluding to a vast econometric literature, which suggests that shocks to output can be long-lasting. Stiglitz emphasizes the destabilizing influence of short-term capital flows in his analysis, arguing that there is a fairly compelling case against full liberalization and stresses for the effective designing of interventions against short-term capital flows.

Kohli (2003) examined how capital flows affect a range of economic variables such as exchange rates, interest rates of foreign exchange reserves, domestic monetary condition and financial system in India during the period 1986 to 2001. She has examined how capital inflows induce real exchange rate appreciation, stock market and real estate boom, real accumulation and monetary expansion as well as effects on production and consumption. She investigated the impact on capital flows upon the domestic financial sector in India. Inflows of foreign capital have a significant impact on domestic money supply and stock market growth, liquidity and volatility. At the conclusion, the domestic financial sector that is the banking sector and capital market in the event of a heavy inflow of foreign capital in India. Correlation between domestic and foreign financial market highlights India’s vulnerability to external financial shocks. For India on the relationship between portfolio flows and some stock market indicators suggest that market price are not unaffected by capital inflows. So far the difference between net capital inflows and current account deficit has been positive in India.

Chakraborty (2001) explained the effects of inflows of private foreign capital on some major macroeconomic variables in India using quarterly data for the period 1993-1999. She analyses of trends in private foreign capital inflows and some other variables indicate instability. She has taken the net inflows of private foreign capital as well as macroeconomic variables foreign currency assets, wholesale price index, money supply, real and nominal effective exchange rates and exports. The Co integration test confirms the presence of long-run equilibrium relationships between a few pairs of variables. But the dependence of each variable on private capital flows invalidates such co integration except in two cases: co integration exists between foreign currency assets and money supply and between nominal effective exchange rate and exports, even after controlling for private capital flows. The Granger Causality Test shows unidirectional causality from private capital flows to nominal effective exchange rates- both trade-based and export
based, which raises concern about the RBI strategy in the foreign exchange market. Finally, instability in the trend of foreign currency assets could be partially explained by the instability in private capital flows with some lagged effect. Roy (2007), argues that it is essential to understand the basic motives underlying the financial flows before liberalizing them. In this case, an empirical analysis to identify whether the foreign portfolio flows to India are driven either by the capital gains motive or the income gains motive is attempted. The variables identified for the regression analysis are net foreign portfolio flows as dependent variable and the stock price change, exchange rate change of rupee in terms of US dollar and real interest rate differential as independent variables. It has been found out that the foreign portfolio flows to India are driven primarily due to the capital gains motive and in the Indian case it is the change in stock prices. Before the analysis the econometric methodology has confirmed the long lasting relationship between the variables. Moreover, the causality checks also reveal that stock prices are causing the Net foreign portfolio flows and not vice versa.

Kaminsky (2003) examined the characteristics of international capital flows since 1970 and summarizes some of the findings of the research conducted in the 1990’s on the effects of globalization. Even if international capital flows do not trigger excess volatility in domestic financial market, it is till true that large capital flows can spark off inflation in the presence of fixed exchange rate. He said globalization allows capital to more to its more attractive destination, fueling higher growth. He suggests that in the short run, globalization triggers bankruptcy of the financial system and protracted recession. The exploration of capital flows to emerging markets in the early and mid 1990’s and the recent reversal following the crisis’s around the globe have ignited once again a heated debate on how to manage international capital flows. He indicates capital outflows worry policy makers, but so do capital inflows as they may trigger bubbles in asset market and foster an appreciation of the domestic currency and a loss of competitiveness.

This globalization of financial markets has gone together with an increase in cross border capital flows. In the 1990s, several research studies have explored the cause and effect relationship between FII flows and domestic stock market returns, but the results have been mixed in nature.

Tesar and Werner (1994, 1995), Bohn and Tesar (1996) and Brennan and Cao (1997) have examined the estimates of aggregate international portfolio flows on a quarterly basis and found evidence of positive, contemporaneous correlation between FIIs and stock market returns. Jo (2002) has shown empirically tested instances where FII flows induce greater volatility in market compared to domestic investors. Douma, Pallathiatta and Kabir (2006) investigated the impact of foreign institutional investment on the performance of emerging market firms and found that there is positive effect of foreign ownership on firm performance. They also found impact of foreign investment on the
business group affiliation of firms. Aggarwal, Klaper and Wysocki (2005) observed that foreign investors preferred the companies with better corporate governance. Investor protection is poor in case of firms with controlling shareholders who have ability to expropriate assets. The block shareholders affect the value of the firm and influence the private benefits they receive from the firm. Companies with such shareholders will find it expensive to raise external funds. Li (2005) observed that in case of poor corporate governance the foreign investors choose foreign direct investment (FDI) rather than indirect portfolio investment. It is generally believed that FDI could be better protected by private means.

Patnaik (2005) examines the institutionalization of savings by institutional investors in majority of developed countries acted as source for the short-term portfolio flows coupled with this, the low rates of returns also resulted in the export of financial savings from these developed nations. As the assets of institutional investors expanded, their diversification strategies increasingly resulted in an expansion of cross-border investments, especially to emerging markets, which had high rates of return and was mainly in the form of equity finance. These portfolio investments have always been subject to controversies in terms of their motives, desirability, their impact on the domestic economy and stock market and their influence on domestic policy making. Today, India is a major recipients’ of the world portfolio flows. Prasanna, P.K. (2008) examines the contribution of foreign institutional investment particularly among companies included in sensitivity index (SENSEX) Bombay Stock exchange. He also examined the relationship between foreign institutional investment and firm specific characteristics in terms of ownership structure, financial performance and stock performance; it is observed that foreign investors invested more in companies with a higher volume of shares owned by the general public. The promoters’ and the foreign investors choose the companies where family shareholding of promoters is not substantial. Among the financial performance variable the share returns and earnings per share are significant factors influencing their investment decision. Griffin et al. (2002) also establishes a similar relationship for several Asian countries using daily data. Studies by Richards (2002) and Griffin et al. (2002) find a positive relationship between daily foreign portfolio flows to Asia and lagged U.S stock market returns. Samal (1997) and Pal (1998) have focused on one of the items of portfolio investments, the foreign institutional investment into India’s equity market. They argue that, the investments by FIIs and the movements of the Sensex are quite closely related in India and that FIIs wield a significant influence on the movement of the Sensex. A study by National Stock Exchange (NSE, 2001) also observes that, in the Indian stock markets FIIs have a disproportionately high level of influence on market sentiments and price trends. According to Pal (2005) FIIs not only are the major players in the domestic stock market
in India, but their influence is also growing. To him, FIIs have emerged as the most
dominant investor group in the Indian stock market scenario. Chakrabarti (2005)
conducted a systematic study on the FII inflow and found domestic stock market returns
having contemporaneously positive and significant influence on FII inflows. But Gordon
and Gupta (2003) find a negative relationship between lagged Indian stock market returns
and the FII inflows. Rai and Bhanumurthy (2004) noting the increasing importance of
foreign institutional investments in India’s capital account and the issue of capital
account convertibility investigated the basic determinants of the foreign institutional
investments. Using monthly data they found that FII inflow depends on stock market
returns, inflation rates (both domestic and foreign), and ex-ante risk.
Khan et al. (2009) investigates the causal relationship between Nifty and FIIs’ net
investment for the period January, 1999 to February, 2009 using daily data. This period
has been divided into four phases on the basis of major global events. Nifty and FII are
not normally distributed in all four phases. Nifty was found to be non-stationary at level
and stationary at first level while FII came out to be stationary at level itself. Correlation
between FII and Nifty was the maximum in the bear phase as compared to all other
phases. Further we found the causality between Nifty returns and FIIs net investment.
Granger Causality highlighted unidirectional relationship of Nifty over FIIs during each
phase in the long run. Variance decomposition and impulse response functions
determined the short term causal relationship which reveals that there was only positive
unidirectional causality from Nifty to FIIs. No reverse causality was observed in any
phase. Griffin (2004), found that foreign flows are significant predictors of returns for
Korea, Taiwan, Thailand and India, indicating that foreign investors are buying before
market index increases. He also found that contemporaneous flows are positive and
highly significant in India. FII and Stock Index show positive correlation, but fail to
predict the future value. Ahmad et al. (2005) reveals that the FIIs investments are
influenced by the previous trading day returns, confirming the positive feedback strategy
by them, but they are also influenced by the next trading day returns. Most of the studies
generally point to the positive relationship between FII investments and movement of the
National Stock Exchange share price index some also agree on bidirectional causality
stating that foreign investors have the ability of playing like market makers given their
unidirectional causality from stock returns to FII flows irrelevant of the sample period in
India whereas the reverse causality works only post 2003. However, impulse response
function shows that the FII investments in India are more stock returns driven. Perhaps
the high rates of growth in recent times coupled with an increasing trend in corporate
profitability has imparted buoyancy to the stock markets, triggering off return chasing
behavior by the FIIs. Bansal and Pasricha (2009), studied the impact of market opening to
FIIs, on Indian stock market behavior. India announced its policy regarding the opening of stock market to FIIs for investment in equity and related instruments on 14th September 1992. Using stock market data related to Bombay Stock Exchange, for both before and after the FIIs policy announcement day. An empirical examination has been conducted to assess the impact of the market opening on the returns and volatility of stock return. They found that while there is no significant changes in the Indian stock market average returns, volatility is significantly reduced after India unlocked its stock market to foreign investors. Gompers et al. (2001) prove that institutional investors invested in liquid and large stocks having low returns during the previous year. So an increase in the institutional demand in share market will affect stock market prices and returns if supply and demand curves for that particular share are not perfectly elastic.

Theoretical and empirical research on the role of foreign capital in the growth process has generally yielded conflicting results. Conventionally, the two-gap approach justifies the role of foreign capital for relaxing the two major constraints to growth (Chenery and Bruno, 1962; McKinnon, 1964). In the neo-classical framework, however, capital neither explains differences in the levels and rates of growth across countries nor can large capital flows make any significant difference to the growth rate that a country could achieve (Krugman, 1993). Mihir Desai et. al.(2005) focus on the impact on rising foreign investment on domestic activity. It is observed that firms whose foreign operations grows rapidly exhibit coincident rapid growth of domestic operations but this pattern is inconclusive as foreign and domestic business activities are jointly determined. Their studies uses foreign GDP growth rates interacted with lagged firm specific geographic distributions of foreign investment to predict changes in foreign investment by a large number of American firms. Estimates indicate that 10% greater foreign capital invested is associated with 2.2% greater domestic investment and 10% greater foreign employee compensation is associated with 4% greater domestic employee compensation. They find that the changes in foreign and domestic sales, assets, and no. of employees are positively associated and also greater foreign investment is associated with additional domestic exports and R&D spending. Lucas (1990) has also analyzed the issue by examining the question of why capital does not flow from rich to poor countries and critically explored some candidate answers that are based on human capital and capital market imperfections. With regard to human capital, he shows that the rich country’s optimal policy is to retard capital flows so as to maintain real wages at artificially low levels in the poor country. As far as capital market imperfections are concerned, Lucas’s paper analyzes a borrowing contract between poor and rich countries. In this paper, the focus is on linkages and on the rational behavior of different foreign investors in the face of reform uncertainty. Dijkstra (2000), Tybout (2000) and Vachani (1997) found that investment policy liberalizations have major impacts on firms in less developed countries.
where the pre-liberalization level of protection was high. Not all firms are
affected equally; some will be losers while others will be winners, depending on their
characteristics.

Sikdar (2006) examines the differential impact of different types of capital inflows
through an extension of standard Mundell-Fleming analysis. He concluded that (1) an
increase in FPI causes currency appreciation and contraction in output. (2) An increase in
FDI may lead to a rise in income if the direct plus indirect (crowding in) effects are
strong enough. This contrast with the standard Mundell-Fleming because it leads to a fall
in net exports through currency appreciation. Sudden stops in capital flows to emerging
market economies are a key characteristic of several recent financial crises. The sudden
stop problem, first emphasized by Calvo (1996) while analyzing the impact of capital
inflows on a number of Asian and Latin American countries concluded that several Asian
countries have experienced capital inflows similar to those in Latin America without
associated sizable appreciation of the real exchange rate. A two sector small open
economy model developed by Corden (1991, 2002) was used to analyze the impact of
sudden stops in capital inflows on an internal and external equilibrium and to explore the
merits of disposing of the nominal exchange rate as policy tool in rectifying real
exchange rate misalignments. It was shown how the economy’s sectoral demand
properties determine the extent of recession associated with real exchange rate
adjustment that is neither engineered by nominal exchange rate changes nor brought
about by a decline in non-traded goods prices. The conclusion was drawn that, when
deciding on the design of exchange rate regimes, the structural characteristics of the
economy ought to be considered so as to appropriately strengthen its capacity to cope
with shocks in the form of negative swings in capital inflows. Sachs, Tornell and Velasco
(1996), provide the study that empirically investigates all of these issues and they find
that neither high capital inflows nor their composition has any significant effect on
currency crises. However, their study focuses on 20 emerging market economies only
during the 1994 Mexican crisis and it does not include the second half of the 1990s. As a
result it leaves out many recent emerging market crises. This study is the first to
specifically investigate the connection between large capital inflows and a sudden stop
crisis in a cross country panel setting.

Sudden stops in capital flows to emerging market economies are a key characteristic of
several recent financial crises. The sudden stop problem, first emphasized by Calvo
(1998), features an abrupt cessation in foreign capital inflows and/or a sharp capital
outflow concurrently with a currency/balance of payments crisis. Calvo et al. (2002), for
example, provide a sudden-stop interpretation for the current crisis in Argentina in which
the capital flow reversal together with dramatic real exchange rate depreciation
significantly worsened the government’s fiscal position and led to default. In a broad
historical examination, Bordo et al. (2001) argue that the sudden stop problem has become more severe since the abandonment of the gold standard in the early 1970s. Kaminsky (2003) argued that sudden stops are a special variety of currency crisis. Finally, Mendoza and Smith (2002) define three key features of Sudden Stops: “sharp reversals in capital inflows and current account deficits, large downward adjustments in domestic production and absorption, and collapses in asset prices and in the relative prices of non tradable goods relative to tradable”. Sudden stops may have severe consequences for the economy, as the abrupt reversal in foreign credit inflows in conjunction with a realignment of the exchange rate may cause a sharp drop in domestic investment, domestic production and employment. The adverse consequences of a sharp reversal in foreign capital inflows could be the reason that only a subset of currency/balance-of-payments crises in emerging market economies are found to be associated with recessions (Hutchison and Noy, 2002; Gupta et al., 2003).

Calvo et al. (2004) and Cavallo and Frankel (2004), they considered both the first and the second moments of the capital flow series in identifying sudden stops. First, they identify the years where the financial account balance exhibited a large decline relative to its long term average. They require this to be a large discrete drop and not just a correction of a large temporary inflow. Second, they calculate the mean and one-standard deviation band of the financial account balance using the data up to the years identified in the first stage as potential sudden stops and retain only years that qualify on the basis of this criterion. Sula (2006) also provided the study that empirically investigates all of the recent emerging market currency crises is a preceding surge in capital inflows and their reversals or ‘sudden stops’ during the crises. However, their study focuses on 38 emerging market economies between 1990 and 2003 reveals that a surge in capital inflows significantly increases the probability of a sudden stop. In addition, a surge accompanied by a high current account deficit or an appreciated real exchange rate is more likely to be associated with a sudden stop. The paper also finds that a surge that is dominated by private loans and portfolio flows rather than direct investment has a higher probability to end with a sudden stop. Beck and Rahbari (2008) derived optimal central bank portfolios in cases where the country is subject to sudden reversals in capital flows and the central bank uses its reserves to smooth decreases in absorption in the case of a reversal. They show that in our two asset minimum variance approach with transaction demand, the optimal shares can be decomposed analytically into asset demand derived from traditional portfolio objectives and hedging demands related to sudden stops. They further show that the hedging demands become less important relative to traditional portfolio objectives as debt to reserve ratios decrease. Whether the introduction of transactions demand increases or decreases the optimal dollar share depends on whether the dollar is a better hedge for sudden stops than the euro. In their empirical section, they
find that dollars are a better hedge for global sudden stops, and for country specific
sudden stops in many cases, but that there is a regional pattern if we consider regional
sudden stops.

Calvo et al. (2000) examined that capital account reversal have become more severe for
emerging markets. Because policy options are limited in the midst of a capital market
crisis and because so many countries have already had crises recently, they focus on
some of the policies that could reduce the incidence of crises in the first place or at least
make the sudden stop problem less severe. In this regard, we consider the relative merits
of capital controls and dollarization. They conclude that, while the evidence suggests that
capital controls appear to influence the composition of flows skewing flows away from
short maturities, such policies are not likely to be a long-run solution to the recurring
problem of sudden capital flow reversals. Yet, because fear of floating, many emerging
markets are likely to turn to increased reliance on controls. Dollarization would appear to
have the edge as a more market-oriented option to ameliorate, if not eliminate, the sudden
stop problem. Broner and Rigobon (2006) showed that capital flows to emerging markets
are more volatile than those to developed countries. Using GDP per capita, inflation rates,
real depreciation of exchange rates, terms of trade and interest rates from a set of
emerging countries, the standard deviation of the error from panel estimations was
greater than the error from a panel using data for developed countries in more than 60%.
This standard deviation was deeply reduced using own lags of capital flows and
contagion variables. Current account deficits do require policymakers’ attention if global
capital markets become a “crue master” (Lipschitz et al. (2002)) and expose the
economy to sudden stops in capital inflows, thus leading to a change in the equilibrium
real exchange rate and rendering the existent external imbalance non-sustainable. Many
countries, emerging market economies in particular, have responded to this drying up of
foreign financing by moving to more flexible exchange rate regimes (see e.g. Bubula and
Otke-Robe (2002). Reckless fiscal policy can result in unsustainable levels of public
debt, especially when excessive borrowing from international capital markets is
channeled into unproductive government expenditure. When default seems likely, lenders
stop lending. This view certainly applies to the Latin American debt crisis in the 1980’s
but cannot explain the Asian meltdown in which stricken countries had low debt to GDP
ratios, nor can it explain the bunching of sudden stops in countries with very different
fiscal positions. Nevertheless, lack of fiscal discipline has played a role in crises in the
past. In fact, if one considers the prospect of government bailouts of weak banking
sectors, the fiscal position was far worse than on paper (Burnside, et al., 2001). In that
case, the fiscal view becomes more applicable to the Asian crisis as well.

Cavallo (2005) used gravity estimates as instrumental variables for trade to test the
proposition that countries that trade less with rest of the world are more vulnerable to
sudden stops in capital flows. He found that, all else equal, a 10% point increase in the trade to GDP ratio reduces the probability of sudden stop by approximately 32%. Aizenman (2003) showed in the setting of a simple model how more commercial openness increases the effective cost of enforcing financial repression, making financial openness be a byproduct of greater trade integration. Similarly one could potentially think of a reverse causality process, whereby for example, greater financial openness may reduce the cost of trade credit and encourage FDI, and both adjustments may facilitate more commercial trade. More recently, Aizenman and Noy (2004) investigated the presence of two-way feedbacks between financial and trade integration and present evidence on the existence of such connections. So, in trying to explain sudden stops with closeness, one can fall into the following identification problem: maybe countries that are less prone to sudden stops for reasons other than trade (i.e. a long tradition of financial openness and reliability) end up trading more with other countries. Eichengreen et al. (2006) examined the impact of conventional IMF-supported programs on the incidence of sudden stops. Correcting for the non-random assignment of programs, they find that sudden stops are fewer and generally less severe when an IMF arrangement exists and that this form of “insurance” works best for countries with strong fundamentals. In contrast there is no evidence that a Fund-supported program attenuates the output effects of capital account reversals if these nonetheless occur. Finally, Mendoza and Smith (2002) defined three key features of Sudden Stops: Sharp reversals in capital inflows and current account deficits, large downward adjustments in domestic production and absorption, and collapses in asset prices and in the relative prices of non-tradable goods relative to tradable. Sudden stops may have severe consequences for the economy, as the abrupt reversal in foreign credit inflows in conjunction with a realignment of the exchange rate may cause a sharp drop in domestic investment, domestic production and employment.

The above studies examines the importance of capital inflows in India, also examines the impact of foreign direct investment on the growth rate of India and impact of FIIs on Indian stock market and sudden stops of capital inflows in the less developed countries and carious other aspects related to the capital flows. But these studies does not focus on the impact of total capital flows on the growth rate of India and siphoning off (slowdown) of capital inflows in India. Therefore, the main focus of the present study is to examine the impact of the capital flows on the growth rate of India, and impact of slowdown of capital inflows in India and to find out the causes, consequences and policy options to overcome the impact of slowdown of capital inflows.
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CHAPTER 2 (B)  

RESEARCH METHODOLOGY

A systematic process and methodology is needed to conduct the research in a successful manner. This section of the study highlights the methodology and process used to conduct the present research. This section justifies the present study and highlights the main objectives and hypotheses of the study. Further, this section discusses the research methodology adopted for attaining the objectives and to test the hypotheses of the study. In the end of section, scope and limitations of the study are discussed.

JUSTIFICATION OF THE PRESENT STUDY

Foreign capital has significant role for every national economy, regardless of its level of development. Capital inflow helps developing countries with economic development by furnishing them with necessary capital and technology. Capital flows contributes in filling the resource gap in countries where domestic savings are inadequate to finance investment. Adequate capital inflows help the concerned economy to increase its productivity and move towards industrial growth and development of the economy. Thus, capital inflows play a very vital role for the growth and development of developing economy. But this is only one side of coin. Review of literature and international experiences suggest that foreign capital inflows carry a mixed blessing, depending on the ‘initial condition’ of a developing economy. The downside risk evident in macroeconomic shocks is that could undermine the stability of the real sector and impose high adjustment cost of the economy.

In the 1990s, as part of wide ranging liberalization of the Indian economy, fresh foreign investment was invited in a range of industries. Capital inflows in India rose steadily through the 1990s, exceeding US$6 billion in 1996-97. The fresh inflows were primarily as portfolio capital in the early years (that is diversified equity holdings not associated with managerial control). But increasingly, they have come as foreign direct investment (equity investment associated with managerial control). The year 1998 witnessed a marginal outflow from the Indian stock market but soon the inflows went back to the US $ 2.3 billion per year level. Foreign capital inflows were highly volatile in 2004-05 fiscal. However, net inflows were almost same as 2003-04. But in the next three years net capital inflows increased significantly. In the year 2007-08, FDI reached at $32435 million. FPI and FII, which were at slide in the year 2006-07, reported a significant increase in the year 2007-08, after that, in 2008-09 net capital inflows decreased to US $1406 million because of global financial crisis. During the period (2008-09), net capital flows plummeted to 0.5 per cent of GDP from 8.7 per cent in 2007-08. As the adverse
impact of credit crisis in US ebbed, the capital flows into India again accelerated. During the first half of 2011, the net capital flows were US$ 36.7 billion, which was 59.6 per cent higher than the net inflows during the same period of previous year. From the above discussion it is clear that India has experienced both sudden surge and sudden declines of capital flows. This has sparked various macroeconomic issues and challenges before the Indian policymakers.

Volatile foreign capital creates instability in capital inflows. The instability of capital inflows may retard economic growth and structural development, when there is a sudden increase in capital flows; it leads to increase in real exchange rate, inflationary pressures and deterioration in current account. But the sudden declines of capital inflows could push the country into insolvency or drastically lower the productivity of existing capital stocks and affect many macroeconomic variables like exchange rates, interest rates, foreign exchange reserves and domestic monetary conditions etc. When there is sudden reversal of capital flows then it reduces the growth rate of an economy, increases the interest rates and depreciates the currency and others. Both excess and sharp withdrawal of capital inflows is harmful for an economy. Thus, sudden declines in capital inflows are more harmful than an increase in capital inflows. Therefore, the study of various aspects of sudden declines of capital inflows is very important for India policy framework.

The review of literature also highlights that this particular field need comprehensive study regarding many aspects of foreign capital pertaining to sudden declines of capital inflows and policy implications in India. Most of the studies examined the importance of capital inflows in India, also examines the impact of foreign direct investment on the growth rate of India and impact of FIIs on Indian stock market. But these studies do not focus on the impact of total capital flows on the growth rate of India and siphoning off (sudden declines) of capital inflows in India. In fact, sudden declines aspect of capital flows have been little discussed in the Indian context. However, there are some studies exploring the sudden declines aspect of capital flows in the context of East Asian Financial Crisis and Argentina Crisis. There are number of studies highlighting the impact of FDI on economic growth of India. But there is hardly any study, to explore the impact of aggregate foreign capital on India’s economic growth. To explore the real impact of Total Foreign Capital (as FPI contributes significantly in total foreign capital), it is imperative to consider FPI as a part of total capital inflows. FPI is more volatile than FDI, FIIs are the major part of FPI, the study of the impact of FIIs on Indian stock market is also necessary. Therefore, the main focus of the present study is to examine the impact of the capital flows on the growth rate of India, and impact of sudden declines of capital inflows in India and to find out the causes, consequences and policy options to overcome the impact of sudden declines of capital inflows. Therefore, the researcher has decided to work under the title “Siphoning-off of Capital Inflows: Causes, Consequences and Policy
Options for India”. The present study has made an attempt to overcome almost all the limitations of the existing studies. The study aims to attain the following objectives.

**OBJECTIVES OF THE STUDY**

The study examines the impact of sudden stops of international capital flows on the economic growth of India and also makes an attempt to study various causes behind sudden stops of capital inflows in the economy. Further, the study is aimed to explore various macroeconomic challenges posed by sudden stops of capital inflows. Keeping in view the main objective of the study; an attempt has been made to attain the following objectives:

- To examine the trends and composition of capital flows in India.
- To examine the impact of capital flows on economic growth of India.
- To study the impact of Foreign Institutional Investment (FIIs) on the Indian Stock Market.
- To examine the causes and consequences of the sudden declines of capital flows in India.
- To study main concepts and issues surfaced in the current policy debate and suggest policy implication thereof.

**RESEARCH HYPOTHESES**

**A. Testing the casual relationship between foreign capital inflows (FCIs), capital formation (GDCF) and GDP**

  a. $H_0$: FCIs does not Granger cause GDP.
  b. $H_0$: GDP does not Granger causes FCIs.
  c. $H_0$: GDCF does not Granger cause GDP.
  d. $H_0$: GDP does not Granger cause GDCF.
  e. $H_0$: GDCF does not Granger cause FCIs.
  f. $H_0$: FCIs does not Granger cause GDCF.

**B. Testing relationship between FIIs and Stock Market (BSE National Index)**

  a. $H_0$: There is no relationship between FIIs and stock market (BSE).

**C. Testing the Casual relationship between FIIs and stock market (BSE).**

  a. $H_0$: FIIs does not Granger cause BSE.
  b. $H_0$: BSE does not Granger cause FIIs.

**RESEARCH METHODOLOGY**

In modern times, management research has reached a stage of development where the traditional methods and techniques require synthesis and extension. Now, research has become more complex, cost incurring and time consuming activity. Therefore, a systematic process and methodology is needed to conduct the research in a successful
manner. Research methodology is the systematic method/process dealing with enunciating of identifying problem, formulating hypothesis, collecting of facts or data, analyzing these data and reaching at certain conclusion either in the form of solutions towards the problem concerned or certain generalization for some theoretical formulation (Hasouneh, 2003). It also comprised of a number of alternative approaches and interrelated and frequently overlapping procedures and practices. Since there are many aspect of research methodology, the line of action has to be chosen from a variety of alternatives. The choice of suitable method can be arrived at through the assessment of objectives and comparison of various alternatives. Research methodology used in the present study is as under:

**Research Types**

Type of research is based on the nature of data. On the basis of the nature of data, research can be of two types: (1) Qualitative Research and (2) Quantitative Research. In the quantitative research, findings are based on some quantified measures; on the other hand, if the findings are based on some statements, description and other value loaded stories and anecdotes, we may call it qualitative research or exposition research. In the light of the nature of data, the present research is both quantitative as well as qualitative nature, as most of the data used in the present study are based on quantified measures and findings are based on qualitative terms. In quantitative research the aim of researcher is to determine the relationship between one thing (an Independent variable) and another (a dependent or outcome variable). The present study also aims to establish the relationship between foreign investment and other macroeconomic variables. However, the researcher also manipulates the causality and consequences, which also represents a sign of qualitative research. However, there are a number of challenges and issues that crop up when qualitative method are used specially in Econometric studies. These include subjectivity and bias of responses and the inability to incorporate such biases in the econometric studies.

On the basis of the purpose, the research can be of three types: (1) Pure Research or Fundamental Research, which aims at findings out new knowledge which has more or less theoretical orientation. (2) Applied Research and (3) Action Research, which aims at solving such type of problems which have already becomes a part of action plan. In fact, action research and applied research are interwoven. In terms of degree and action research aims at solving such business problems which would show immediate utility. In the light of purpose of research, the present study is mainly of applied nature as the researcher has tried to test the assumptions and applications of the problem in a given set of conditions (Sharma and Jain, 2004).
RESEARCH DESIGN
Reliability and validity of the research require the planned paradigm of investigation and inquiry necessarily required for conducting the concerned project work. A good research design depends on two aspects of its designing: First, specifying what one wants to find out, i.e., properly posing the problem or properly phrasing the issues to be studied or the logical structure of inquiry; and Second, determining how to do it, i.e., collecting data through scientific and appropriate methods, using effective techniques of data analysis and rational and meaningful deductions. Therefore, the researcher has to take great care in the preparation of research design (Thanlingom, 2003). There are many types of research design and there is no standard or ideal research design to guide the researcher; many different research designs may accomplish the same objectives. Broadly, research design can be of three types: (1) Exploratory (2) Descriptive and (3) Causal/Experimental.
In the present study, mainly exploratory research design has been adopted, as the main purpose of this study is to gain familiarity with the various aspects of foreign investment and to achieve new insights into it. Further, the study formulates more precise research problem by developing hypothesis. Since the scope of the study is very vast, the present study also represents some characteristics of descriptive research design.

DATA COLLECTION
In research, the quality and richness of results will be of high level if the used information is a texture of verity and correctness. Therefore, due consideration has been given to the type and method of data collection (Wilkinson and Bhandarkar, 2000). There are two types of data: primary data and secondary data. The present study is entirely based on the secondary data pertaining capital inflows to Indian economy.

Data Sources: Secondary data has been collected from various reports of Reserve Bank of India, books, journals, magazines and websites (Appendix 3). Websites of NSE and BSE has also been used for data collection. The main source of secondary information was RBI Bulletin and SEBI bulletin. Added to this websites www.rbi.org.in, www.tradingeconomics.com, www.moneycontrol.com and yahoo finance has been highly used to collect various other information. Some important information has also been compiled from the different newspapers.
In short, the data was extracted from the following sources:

- SEBI Bulletin.
PERIOD COVERED UNDER PRESENT STUDY
In most of the period since the mid-1990s, external sector developments in India have been marked by strong capital flows. Capital inflows, which were earlier mainly confined to small scale official concessional finance, gained momentum from the 1990s after the initiation of economic reforms. As well as increasing in size, capital inflows have undergone a compositional shift from predominantly official and private debt flows to non-debt-creating flows in the post-reform period. Capital flows since 1990s are not only characterized by massive inflows but also by volatility. This volatility can have widespread economic consequences. Large increases and decreases in capital flows can amplify economic cycles, increase financial system vulnerabilities, and aggravate overall macroeconomic instability. Therefore, the researcher has used the data from 1991-2010 (20 years). But in some cases the data of crises period i.e. 2008-10 has been taken to study the causes and consequences of the impact of sudden declines of capital inflows on India.

DATA COLLECTION PROCEDURES
Since the present study is based on secondary data, it was very important for the researcher to find out various sources of data. But at the same time it was more challenging for the researcher to collect more reliable, accurate and complete data. To search the best data source, researcher visited various libraries and searched for various data sources published by government of India and other national and international research/concerned agencies/departments. After analyzing various data base, researcher decided to extract data from database on Indian Economy (http://dbie.rbi.org.in) freely available on the website of Reserve Bank of India (RBI’s Data Warehouse). RBI Data Warehouse was obvious choice of researcher mainly because of three reasons: easy availability of data, reliability of data and most importantly cost of data (it is freely available for researcher) Researcher also used handbook of statistics in print form issued by RBI. Added to this, many other reliable sources were also used mentioned in the data collection section of this chapter. The data collection process took almost six months to complete.

DATA CLASSIFICATION AND TABULATION
Whenever the data of secondary nature are used for the research purpose, the arrangement thereof is required in the form of classification and tabulation leading to the purposeful analysis and results. Therefore, to locate similarities and reduce mental strain researcher resorted to classification of data. Classification condensed the data by dropping out unnecessary details. It facilitated comparison between different sets
of data clearly showing the different points of agreement and disagreement. Classification of data enabled the researcher to study the relationship between several characteristics and make further statistical treatment like tabulation, etc. Classified data were tabulated with the help of computer software MS-Excel to investigate the research problems.

**DATA ANALYSIS**

The task of data collection is completed when all entries are filled with the appropriate responses or values (Galtung, 1967). After the data has been collected the researcher turns to the task of data processing and further analysis these data. ‘Data Processing and Analysis’, the task is to take the completed data matrix, which is amenable to processing, and do two things with, in this order: (1) Processing: to recast the matrix, concentrate and otherwise deal with it so that the data are as amenable to analysis as possible and (2) Analysis: to see the data in the light of the hypotheses and theories, and draw conclusions that are amenable to the theory formation as possible (Galtung, 1967).

In the present study, data of each variable has been collected through the various sources and tabulated with the help of computer to summarize it. For analyzing the data, both simple and advanced statistical tools have been used. In some cases simple statistics like average, percentage and standard deviation have been applied. In order to achieve various objectives of the study, OLS (ordinary least square method), Multiple regression method and other advance statistical and econometrics tools have been used.

**ANALYTICAL TOOLS**

In the present study both simple and advance statistical and econometric tools has been applied. Some of the important tools applied to test the hypotheses and investigate the objectives are given as under:

1. **Unit Root Test (Augmented Dickey Fuller and Phillips-Perron tests)**

The test is meant to know the stationarity of the variables. The researcher applied Augmented Dicky-Fuller (ADF) test and Phillips-Perron (PP) test. ADF is an augmented version of the Dickey–Fuller test for a larger and more complicated set of time series models. The augmented Dickey–Fuller (ADF) statistic, used in the test, is a negative number. The more negative it is, the stronger the rejections of the hypothesis that there is a unit root at some level of confidence.

The testing procedure for the ADF test is the same as for the Dickey–Fuller test but it is applied to the model

\[ \Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \cdots + \delta_p \Delta y_{t-p} + \epsilon_t \]

Where \( \alpha \) is a constant, \( \beta \) the coefficient on a time trend and \( p \) the lag order of the autoregressive process. Imposing the constraints \( \alpha = 0 \) and \( \beta = 0 \) corresponds to modelling a random walk and using the constraint \( \beta = 0 \) corresponds to modelling a random walk with a drift.
By including lags of the order p (Greek for 'rho') the ADF formulation allows for higher-order autoregressive processes. This means that the lag length p has to be determined when applying the test. One possible approach is to test down from high orders and examine the t-values on coefficients. An alternative approach is to examine information criteria such as the Akaike information criterion (AIC), Bayesian information criterion (BIC) or the Hannan-Quinn information criterion (HQIC). We use this alternative approach of determining the lag length based on AIC.

The unit root test is then carried out under the null hypothesis $\gamma = 0$ against the alternative hypothesis of $\gamma < 0$. Once a value for the test statistic is computed it can be compared to the relevant critical value for the Dickey–Fuller Test.

$$DF_{\gamma} = \frac{\hat{\gamma}}{SE(\hat{\gamma})}$$

If the test statistic is less (this test is non-symmetrical so we do not consider an absolute value) than (a larger negative) the critical value, then the null hypothesis of $\gamma = 0$ is rejected and no unit root is present.

One advantage of ADF is that it corrects for higher order serial correlation by adding lagged difference term on the right hand side. One of the important assumptions of DF test is that error terms are uncorrelated, homoscedastic as well as identically and independently distributed (iid). Phillips-Perron (1998) has modified the DF test, which can be applied to situations where the above assumptions may not be valid. Another advantage of PP test is that it can also be applied in frequency domain approach, to time series analysis. The derivations of the PP test statistic is quite involved and hence not given here. The PP test has been shown to follow the same critical values as that of DF test, but has greater power to reject the null hypothesis of unit root test.

2. Co-integration and Error Correction Model

The central concept of cointegration test is the specification of models, which includes the long run movements of one variable relative to others. In other words, it clarifies the existence of long run equilibrium relationship between the two variables. If the time series variables are non-stationary in their levels, they can be integrated with integration of order one, when their first differences are stationary. These variables can be co-integrated as well, if there are one or more linear combinations among the variables that are stationary. If these variables are being co-integrated, then there is a constant long-run relationship among them.

The co-integration test was first introduced by Engel and Granger (1987) and then developed and modified by Stock and Watson (1998), Johansen (1988) and Johansen and Juselius (1990). The test is very useful in examining the long run equilibrium relationships between the variables.

Consider an unrestricted Vector Auto regression (VAR) model represented by,
\[ Y_t = \mu + \sum_{k=1}^{p} \Pi_k Y_{t-k} + \varepsilon_t \]

Where, \( \varepsilon_t \) is \( p \) dimensional Gaussian error with mean zero and variance matrix \( \lambda \), \( Y_t \) is an \((n \times 1)\) vector of I(1) variables, and \( \mu \) is an \((n \times 1)\) vector of constants. As \( Y_t \) is assumed to be non-stationary, and \( \Delta Y_t = Y_t - Y_{t-1} \) equation (7) could be rewritten in the first difference notation reformulated in error correction form,

\[ \Delta Y_t = \mu + \sum_{k=1}^{p-1} \Pi_k \Delta Y_{t-k} + \Pi Y_{t-1} + \varepsilon_t \]

Where \( \Pi_k = I - (\Pi_1 \cdots \Pi_k) \) ; and \( \Pi = I - ( \Pi_1 , \ldots , \Pi_p ) \). Since \( \varepsilon_t \) is stationary, the rank \( r \) of the long-run matrix determines how many linear combinations of \( Y_t \) are stationary. If the co integrating rank \( r=0 \) so that \( \Pi=0 \), the equation (8) is similar to a traditional first differenced VAR model. With \( 0 > r > n \), there is \( r \) co-integrating vectors or \( r \) stationary linear combinations of \( Y_t \) where \( \Pi = \alpha \beta' \), where both \( \alpha \) and \( \beta \) are \((n \times r)\) matrices. The co-integrating vector \( \beta \) has the property that \( \beta' Y_t \) is stationary although \( Y_t \) is non-stationary.

The co-integrating rank \( r \) can be tested with statistics such as maximum eigenvalue \((\lambda_{\text{max}})\) test and trace test. The asymptotic critical values are in Johansen and Juselius (1990) and Osterwald-Lenum (1992).

The results of VAR models are sensitive to lag length choice (Boswijk and Frances, 1992). They suggest the use of Johansen’s approach to determine the different lag lengths and to base the final and the significance of parameters of higher lags. A VAR model incorporating two lags of each variable is selected from the test applied.

3. Normality Test

The Jarque-Bera (JB) and Anderson Darling (AD) tests are used to tests whether the closing values of stock market and FII follow the normality distribution. The JB test of normality is an asymptotic or large sample test. It is also based on the OLS residuals. This test first computes the skewness and Kurtosis measures of the OLS residuals and uses the following test statistic:

\[ JB = n \left[ \frac{S^2}{6} + \frac{(K - 3)^2}{24} \right] \]

Where \( n = \) sample size, \( S = \) skewness coefficient, and \( K = \) kurtosis coefficient. For a normally distributed variable, \( S=0 \) and \( K=3 \). Therefore, the JB test of normality is the test of Joint hypothesis that \( S \) and \( K \) are 0 and 3 respectively. Under null hypothesis that the residuals are normally distributed, Jerque and Bera showed that asymptotically (i.e., in large samples) the JB statistic follows the chi-square distribution with 2 df. If the \( p \) value of the computed chi-square statistic in an application is sufficiently low, one can reject the hypothesis that the residuals are normally distributed. But if \( p \) value is reasonably high, one does not reject the normality assumption. The Anderson-Darling normality test, known as the \( A^2 \) is used to further verify the findings of JB test.
4. **Correlation Test**  
The correlation is one of the most common and most useful statistics. A correlation is a single number that describes the degree of relationship between two variables. The formula of correlation coefficient is as under:

\[
\text{Correlation (r) = } \frac{N \sum XY - (\sum X)(\sum Y)}{\sqrt{(N \sum X^2 - (\sum X)^2)(N \sum Y^2 - (\sum Y)^2)}}
\]

5. **Granger causality Test**  
Granger causality test was developed in 1969 and popularized by Sims in 1972. According to this concept, a time series \(X_t\) granger causes another time series \(Y_t\) if series \(Y_t\) can be predicted with better accuracy by using past values of \(X_t\) rather than by not doing so, other information being identical. If it can be shown, usually through a series of F-tests and considering AIC of lagged values of \(X_t\) (and with lagged values of \(Y_t\) also known), that those \(X_t\) values provide statistically significant information about future values of \(Y_t\) times series then \(X_t\) is said to Granger cause \(Y_t\), i.e., \(X_t\) can be used to forecast \(Y_t\). The pre condition for applying Granger Causality test is to ascertain the stationarity of the variables in the pair. Engle and Granger (1987) show that if two non-stationary variables are co-integrated, a vector auto-regression in the first difference is unspecified. If the variables are not co-integrated; therefore, Bivariate Granger causality test is applied at the first difference of the variables. The second requirement for the Granger Causality test is to find out the appropriate lag length for each pair of variables. For this purpose, we used the vector auto regression (VAR) lag order selection method available in Eviews. This technique uses six criteria namely log likelihood value (Log L), sequential modified likelihood ratio (LR) test statistic, final prediction error (F&E), Akaike information criterion (AIC), Schwarz information criterion (SC) and Kannan-Quin information criterion (HQ) for choosing the optimal lag length. Among these six criteria, all except the LR statistics are monotonically minimizing functions of lag length and the choice of optimum lag length is at the minimum of the respective function and is denoted as a * associated with it.

Since the time series of FII is stationary or I(0) from the unit root tests, the Granger causality test is performed as follows:

\[
\Delta B_t = \alpha_1 + \beta_{11} \Delta B_{t-1} + \beta_{12} \Delta B_{t-2} + \cdots + \gamma_{11} F_{t-1} + \gamma_{12} F_{t-2} + \cdots + \gamma_{1n} F_{t-n} + \epsilon_{1t} \\
\Delta F_t = \alpha_2 + \beta_{21} \Delta F_{t-1} + \beta_{22} \Delta F_{t-2} + \cdots + \gamma_{21} \Delta B_{t-1} + \gamma_{22} \Delta B_{t-2} + \cdots + \gamma_{2n} \Delta B_{t-n} + \epsilon_{2t}
\]

Where \(n\) is a suitably chosen positive integer; \(\beta_j\) and \(\gamma_j\), \(j = 0, 1, \ldots, n\) are parameters and \(\alpha_j\)’s are constant; and \(\epsilon_j\’s\) are disturbance terms with zero means and finite variances.

(\(\Delta B_t\) is the first difference at time \(t\) of BSE averages where the series in non-stationary.)

6. **Variance Decomposition**  
The vector auto-regression (VAR) by Sims (1980) has been estimated to capture short run causality between BSE averages and FII investment. VAR is commonly used for forecasting systems of interrelated time series and for analyzing the dynamic impact of random disturbances on the system of variables. In VAR modelling the value of a
variable is expressed as a linear function of the past, or lagged, values of that variable and all other variables included in the model. Thus all variables are regarded as endogenous. Variance decomposition offers a method for examining VAR system dynamics. It gives the proportion of the movements in the dependent variables that are due to their ‘own’ shocks, versus shocks to the other variables. A shock to the ith variable will of course directly affect that variable, but it will also be transmitted to all of the other variables in the system through the dynamic structure of VAR. Variance decomposition separates the variation in an endogenous variable into the component shocks to the VAR and provides information about the relative importance of each random innovation in affecting the variables in the VAR. In the present study, BVAR model has been specified in the first differences as given in following equations:

\[
\Delta X_t = \alpha_1 + \sum_{j=1}^{k} (\alpha_{11}(t)\Delta X_{t-j}) + \sum_{j=1}^{k} (\alpha_{12}(t)\Delta Y_{t-j}) + \varepsilon_{ikt}
\]

\[
\Delta Y_t = \alpha_1 + \sum_{j=1}^{k} (\alpha_{21}(t)\Delta X_{t-j}) + \sum_{j=1}^{k} (\alpha_{22}(t)\Delta Y_{t-j}) + \varepsilon_{iit}
\]

Where \( \varepsilon \) are the stochastic error terms, called impulse response or innovations or shock in the language of VAR.

7. Impulse Response Function (IRF)

Since the individual coefficients in the estimated VAR models are often difficult to interpret, the practitioners of this technique often estimate the so-called impulse response function (IRF). The IRF traces out the response of the dependent variable in the VAR system to shocks in the error terms. So, for each variable form each equation separately, a unit shock is applied to the error, and the effects upon the VAR system over time are noted. Thus, if there are m variables in a system, total of m^2 impulse responses could be generated. In our study there are four impulse responses possible for each phase, however we have considered only two, which are of our interest. In econometric literature, but impulse response functions and variance decomposition together are known a innovation accounting (Enders, 1995).

8. Logit Regression Model:

In statistics, logistic regression (sometimes called the logistic model or logit model) is used for prediction of the probability of occurrence of an event by fitting data to a logit function logistic curve. It is a generalized linear model used for binomial regression. Like many forms of regression analysis, it makes use of several predictor variables that may be either numerical or categorical.

In the present study the researcher has applied Logit model of regression to investigate which factors increases the probability that the economy experiences sudden stops. Illustrated by equation (1), the regression specification is as follow:
$SS = \alpha + \sum \beta_i X_i + \varepsilon$

Where, $SS$ is incidences of sudden stop, $X_i$’s are factors that determine sudden stops, and $\varepsilon$ is the error term. The value of $SS$ is equal to one if a sudden stop happens, and zero otherwise. The explanatory variables $X_i$ include all factors that determine sudden stops as suggested by the review of literature. All variables $X_i$ are lagged by one period in order to prevent endogeneity, since sudden stops can affect almost all explanatory variables $X_i$.

PRESENTATION OF RESULT

Both qualitative and quantitative statistical techniques have been used to present the result in a systematic and more meaningful manner. To review the problem more rigorously, content analysis of government policies and quantified results of other studies has been done. Simple and advanced statistical tools have been applied to test the various hypotheses and investigate the problems. The results of study has been presented in tabulation and econometrics forms and discussed in the last chapter of the study. On the basis of these results, some viable suggestions are also presented. Important information, which could not be presented in the text of thesis, has been presented in the form of appendices.

LIMITATIONS AND SCOPE OF THE STUDY

Since the scope of the study in this particular field is really very vast and collected data provides huge information; therefore the researcher could find out some other interesting results. But, the researcher has limited the result of present study according to objectives and hypothesis of the study. However, the researcher tried to include all the necessary information for justifying the result of the study. Due care has been given in collection of data, methodology and in presentation of study, but every study, not matter how well it is conducted, has some limitations. The present study is not the exception either, some limitations of the study which researcher admits here are:

First, like all research, the findings here need to be interpreted cautiously given the inherent data constraints of the macroeconomic times series data and the scope of this research. Due to the inherent data constraints of the macroeconomic time series data, the above results are admittedly tentative. Yet it is true that they reveal certain new facts of the capital inflows from India that have not been examined earlier. Moreover, India’s success regarding capital inflows is very recent, dating back to the economic reforms of the nineties. With such short story, it is yet to be seen whether the time series data can sustainably display the relations that the empirical evidence of this study suggests or whether the interaction of the economic variables changes the prevailing pattern. Second, in the present study correlation test has been applied. Correlation research merely demonstrates that we can predict a variable from another variable. It is demonstrating that two variables are associated. However, two variables can be associated without there being a causal relationship between the variables. We can not make causal conclusions from correlational findings because we cannot rule out all alternative explanations for
correlational findings. Thus, making causal conclusions from correlational findings is a logical error. For every correlational study, there is the possibility that some third variable caused the two variables without there being a causal relationship between the variables. Last but not the least, there could be errors and omissions.

**SCOPE FOR FURTHER RESEARCH**

The present study makes an attempt to investigate the problems of sudden declines of capital flows in the context of Indian economy. However, there are areas that can be improved as well as topics that should be investigated. Therefore, the researcher discusses the potential research that should be done in the future.

In the present study net capital flows has been used to analyze the different objectives. There is need to develop a new methodology to analyze extreme movements in capital flows using data on both inflows and outflows by domestic and foreign investors. It will provides a more detailed disaggregation of capital flows, defining not only periods of surges and stops when foreign investors substantially increase or decrease capital flows to a country, but also periods of flight and retrenchment when domestic investors substantially increase or decrease their capital flows abroad. It will provide more detailed disaggregation of capital flows which is critically important to understand the important drivers of capital waves. In the area of causes of sudden stops, it is worth developing a model that can explain all mechanisms that induce sudden stops. The model should be developed from a perspective of capital flows and their problems rather than from a standpoint of the intertemporal approach to the current account. Looking at the sudden declines from this perspective will help to understand the linkage among the capital flows, sudden declines and financial crisis. Existing studies including present one concludes that capital account reversal has become more severe for emerging economies like India, because policy options are limited in the midst of a capital market crisis and because so many countries have already had crises recently, there is need to focus on some of the policies that could reduce the incidence of crises in the first place, or at least make the sudden stop problem less severe.

**REFERENCES**


