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STUDY OF THE IMPACT OF FOREIGN INSTITUTIONAL INVESTMENTS ON INDIAN STOCK MARKET

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ABSTRACT

Foreign Direct Investment can persuade the factor productivity of the recipient country and also shape the balance of payments. India's foreign investment framework has been influenced by perceptions that foreign investment is volatile and could respond sharply to adverse domestic events, thus exacerbating a domestic crisis. From an Indian perspective, comparative policy analysis and proposals are more productive and interesting with BSST countries. The paper empirically investigates the FII flows in India This study considers factors in deciding which countries would offer meaningful comparative study: size, and democratic governance with the rule of law. The study concludes that there is a bidirectional relationship between FII flows and return that there is a strong evidence of positive feedback trading

INTRODUCTION

Foreign investment refers to the investments made by the residents of a country in the financial assets and production processes of another country. The cause and benefit of foreign investment, however, varies from country to country. It can persuade the factor productivity of the recipient country and also shape the balance of payments. In developing countries like India there has been a felt need for foreign capital, not only to boost the productivity of labour but also to help to building up the foreign exchange reserves needed to meet our trade deficits. Foreign investments provide a direction through which developing countries can gain access to foreign capital for their economic development. From the early 1990s onwards, trade liberalisation in India has been accompanied by a process of gradual liberalisation of capital flows management regulations. The FII framework was setup in the early 1990s, and further rationalised by the late 1990s.

The home bias of global equity portfolios against India started getting alleviated by the early 2000s, a decade after the first opening to foreign investors. Debt inflows, and outward flows began in the late 1990s. FDI inflows began in the early 1990s and have gathered momentum, particularly after India became important to global private equity funds.

The Government of India allowed Foreign Institutional Investors to Invest in stock market in September 1992, which lead to the integration our economy with global financial markets. Since then, FII flows seem to exhibit four different structural periods with widely different characteristics in quantum and momentum. The institutional investors changed their momentum drastically at three different years viz. 1997 (Asian crisis), 2004 (Election and formation of UPA Government), 2008 (Lehman Brothers crisis and Satyam debacle). Initially it seemed that FIIs are speculators and tend to make money in short span whereas of late they are net buyers in spite of mutual funds being net seller. Thus the prima facie facts lead to a mixed observation.

The percentage share of FII is 13% and 6% in NSE and BSE respectively in annual cash market turnover, whereas the mf contributes less than 4% and 2% respectively. This reflects the dominating participation of foreign investors in our cash market over mutual fund houses. FII has negligible role in the unit holding pattern of mutual funds even lower than 2% of total investors account. This unit holding is predominantly at 2.52% in private mutual funds as compared to 1% in public sector mutual funds.

In the last two decade since liberalization the FII flows stood at moderate level close to 1500 million US $ till Asian crisis which emerged as the year of largest mass exit since liberalization. Then after resilience the market reached to new high around 10000 million US $ which subsequently collapsed in 2008 followed by bumper FII flows to the tune of 30000 million US $. Thus in total the overall trend of FII flows has four structural periods as 1993-1997, 1998-2003, 2004-2007, and 2008 onwards.

1.2 The behaviour of the Indian economy

In this section, we briefly assess some questions about the behaviour of the Indian macro economy and Indian firms given India's deepening de facto capital account integration.

Table 1: Do FIIs exit *en masse* at times of domestic stress?

Event	T-1	T	T+1	T-1	T	T+1
Parliament attack 12-12-2001	-91.0	78.8	-90.4	-0.015	0.012	-0.015
Gujarat riots 27-02-2002	141.8	178.8	-2.9	0.020	0.025	-0.0001
UPA government 13-05-2004	-295.5	-604.5	-504.4	-0.029	-0.060	-0.050
Mumbai attacks 26-11-2008	-436.0	Holiday	419.4	-0.015	NA	0.015

Source: CMIE Business Beacon database

Table 2: Gross versus Net FII Activity in the crisis

(Rs Crore)

Month	Gross Buy	Gross Sell	Net Buy
July 2008	70592	68010	2582
August 2008	48914	49792	-877
September 2008	75214	80061	-4846
October 2008	52014	68310	-16296
November 2008	37746	36383	1363
December 2008	38925	36979	1945

Source: CMIE Business Beacon

Are FIIs fair weather friends?

Looking at *en masse* exit by FIIs in times of domestic stress, Table 1 shows information about net FII inflows on the equity market in four recent episodes of market stress. In each of them, relatively small values are seen for the net sales by FIIs. The largest values in the table involve net sales of 0.11 percent of market capitalisation on the event date ('T') and the following day ('T+1') associated with the formation of the UPA government in 2004. The scenario of massive sales by foreigners when India is experiencing difficulties does not fit the evidence we examined.

Behaviour of FIIs in the Lehman crisis

Table 2 shows data for FII activity in the crisis. The biggest exit in this data was in October 2008, of Rs.16,296 crores of equity capital. However, in October 2008 FIIs (as a whole) *purchased* Rs.52,104 crores of shares and sold Rs.68,310 crores. We note that many thousands of foreign investors are now operating in India, with a diversity of views between them. On any given day, some FIIs buy and other FIIs sell. There is little evidence of *en masse* exit, where a large fraction of FIIs move in only one direction.

Objective

A large number of studies favour the prevalence of positive feedback trading in various stock markets across the globe. Some studies deny its existence. Under this backdrop, the present study is an attempt to examine the static and dynamic relation between FII and stock return in Indian context. To be more specific, the basic objectives of the study are summarized as follows.

- To study the direction of relationship between FII and market return.
- In the case of interdependence do the FII flows dynamically relate to the lagged values of market return and vice versa?
- Does the involvement of FII lead to higher financial performance?
- To empirically examine whether the unexpected component of FII is attributed to market return.
- Does the positive feedback trading hypothesis exist in the Indian stock market?
- Study of global scenario with special reference to FII

Research Methodology

To carry out the in depth analysis between FII and market return the whole study is accomplished in four stages as follows.

1) Static Analysis

As a first step to explore the direction of relationship between FIIPT and market return we perform Granger Causality test to eliminate the simultaneity bias in the bivariate model. By this we specify the channels of causality using the standard "identification by ordering" methodology. The channel of causality is established from the results of Granger Causality test (Granger, 1969). Then we also check the stationary of variables by Augmented Dickey Fuller test and Phillips Perron test to estimate the bivariate model under OLS assumption.

Mathematical Formulation:

G-causality is normally tested in the context of linear regression models. For illustration, consider a bivariate linear autoregressive model of two variables X_1 and X_2:

$$X_1(t) = \sum_{j=1}^{p} A_{11,j} X_1(t-j) + \sum_{j=1}^{p} A_{12,j} X_2(t-j) + E_1(t)$$

$$X_2(t) = \sum_{j=1}^{p} A_{21,j} X_1(t-j) + \sum_{j=1}^{p} A_{22,j} X_2(t-j) + E_2(t)$$

where p is the maximum number of lagged observations included in the model (the model order), the matrix A contains the coefficients of the model (i.e., the contributions of each lagged observation to the predicted values of $X_1(t)$ and $X_2(t)$, and E_1 and E_2 are residuals (prediction errors) for each time series. If the variance of E_1 (or E_2) is reduced by the inclusion of the X_2 (or X_1) terms in the first (or second) equation, then it is said that X_2 (or X_1) Granger-(G)-causes X_1 (or X_2). In other words, X_2 G-causes X_1 if the coefficients in A_{12} are jointly significantly different from zero. This can be tested by performing an F-test of the null hypothesis that A_{12} = 0, given assumptions of covariance stationary on X_1 and X_2.

a) AUGMENTED DICKEY FULLER TEST

b)

In statistics and econometrics, an augmented Dickey–Fuller test (ADF) is a test for a unit root in a time series sample. It is an augmented version of the Dickey–Fuller test for a larger and more complicated set of time series models.

Testing Procedure:

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

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \cdots + \delta_{p-1} \Delta y_{t-p+1} + \varepsilon_t,$$

where α is a constant, β the coefficient on a time trend and *p* the lag order of the autoregressive process. Imposing the constraints α = 0 and β = 0 corresponds to modelling a random walk and using the constraint β = 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, Bayesian information criterion or the Hannan-Quinn information criterion.

The unit root test is then carried out under the null hypothesis γ = 0 against the alternative hypothesis of γ < 0. Once a value for the test statistic

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

is computed it can be compared to the relevant critical value for the Dickey–Fuller Test. 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 γ = 0 is rejected and no unit root is present.

1) Dynamic Analysis

Further in order to capture the dynamic interaction between market return and FIIPT flows we use unrestricted Vector Auto Regression (VAR) without any restrictions on the structure of the system as below:

$FIIPT_t = FIIPT_{t-1} + FIIPT_{t-2+}\ldots\ldots\ldots\ldots FIIPT_{t-n} + R_{t-1} + R_{t-2+}\ldots\ldots\ldots\ldots R_{t-n} + €_1$

$R_t = R_{t-1} + R_{t-2}\ldots\ldots\ldots\ldots R_{t-n} + FIIPT_{t-1} + FIIPT_{t-2}\ldots\ldots\ldots\ldots FIIPT_{t-n} + €_2$

Where, $FIIPT_t$ is the net normalized FII purchases at time t.

We use VAR to quantify the impact of innovations ($€_1$, €2) in returns by net FII purchases and vice versa. In addition we also generate Impulse Response Function to trace the time path of the shocks on the variables contained in the VAR and finally identify the appropriate lag length using the AIC and SBC criterion.

1) Decomposition of FII Flows

To explore the bivariate model further we separate the flows into expected and unexpected components and investigate the regression results of both the components with market return Clark and Berko (1997).

2) Test of Positive Feedback Trading Hypothesis

The positive feedback trading hypothesis describes the strategy of rushing in when the markets are booming and rushing out when the markets are on the decline. Thus it expects a positive relationship between current FII investment and the past performance of the market. For estimation, we examine the following regression.

$FIIPTt = \beta\ Rt\text{-}1 + C$

Where, FIIPTt is net normalized FII purchases at time t. It is calculated by dividing net FIIP at time t by the market capitalization at t-1.

β is regression coefficient and Rt-1 is the return in the previous period.

$\beta > 0$ indicates positive feedback trading.

ANALYSIS

Table 3 and 4 show the descriptive statistics and the autocorrelation (AC) and partial autocorrelation (PAC) at different lags respectively for various components of FII. The results of autocorrelation matrix reveal that the various components of FII have very high correlation at lag 1 but lower correlation at higher lags indicating the daily FII investments are independent of its distant lagged values. There is clear indication that FII pattern is short lived and persists for very short duration. Further we check the order of integration of the variables using unit root test based on Augmented Dickey Fuller Test and Phillips Perron test (Phillips and Perron, 1988).

Table 3: Descriptive Statistics

Variable	Observation	Mean	median	S.D	J.B	
					t-statistics	p value
FIIP	2338	1278.5	732.1	1396.06	4235.1	0.00
FIIS	2338	1180.7	583.5	1353.9	4225.7	0.00
NFIIP	2338	97.64	51.90	554.5	39986.5	0.00
FIIPT	2338	0.011	0.008	0.038	46945.9	0.00

Table 4: Autocorrelation Matrix at Different Lags

Variable	Statistics	length of lag		
		1	3	5
FIIP	AC	0.827	0.784	0.794
	PAC	0.827	0.216	0.141
FIIS	AC	0.867	0.816	0.814
	PAC	0.867	0.199	0.137
NFIIP	AC	0.326	0.227	0.190
	PAC	0.326	0.127	0.060
FIIPT	AC	0.291	0.222	0.151
	PAC	0.291	0.138	0.040

Table 5 present the regression results of FIIPT and UFIIPT with current and lagged daily return. The results show the positive and significant coefficient of lagged return with FIIPT and UFIIPT. It is prime facie evidence that FIIs have been positive feedback traders at aggregate flows. The similarity of regression results using FIIPT and UFIIPT as dependent variable may be on account of significant role of unexpected component (adjusted R square is 0.11) in both the series. The higher value of unexplained variation in regression results is in consonance with the findings of Prasanna (2008) who concludes that in determining the investment of FII, there are several external factors like LIBOR, emerging market stock returns and changes in credit ratings.

Table : Regression Statistics

Regression of Dependent Variable	Independent Variable	Coefficient	Prob.
FIIPT	C	0.010734	0.0000
	RT	0.010668	0.0000
	RTP	0.011622	0.0000
	Adjusted R-squared	0.114059	0.000000
UFIIPT	C	-0.000440	0.5578
	RT	0.010634	0.0000
	RTP	0.011617	0.0000
	Adjusted R-squared	0.113622	0.000000
RT	C	-0.035504	0.0305
	FIIPT	4.884100	0.0000
	Adjusted R-squared	0.057228	0.000000

From the static regression results it is evident that unexpected FII flows play a major role indicating that FII traders are positive feedback traders.

FINDINGS AND CONCLUSION

The empirical investigation of FII flows to India has elicited the following 'stylized facts' about the flows.

a) FII flows are significantly correlated to its own lagged values and lagged return as well.

b) The response of FII flows to one S.E shock to lagged return is sharp and significant for a very short period.

c) There is bidirectional relationship between FII flows and return with the fact that FII granger causes return and vice versa.

d) There is strong evidence of positive feedback trading.

In this study we analyze the static and dynamic relationship between FII flows and stock market in Indian context. The above results are predominantly more important for investors because the quantum of FII inflows have substantially changed in the last decade due to liberalization and have influenced the stock market. Results substantially show that the FII traders have their own fashion of investment and normally their trend persist for a short duration. Further it also leads to the conclusion that the FII traders are rushing into the market when the market shows a bullish trend and rushing out of the market in bearish phase.

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