

Inter-firm differences in FII portfolio investment in India

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I Introduction

In the last two decades, there has been a big surge in net capital inflows in the emerging market economies including India. Both foreign direct investment and portfolio investment have been increasing on a large scale. Data released recently by the Indian stock exchanges show that till November 30, 2006, total foreign portfolio investment in India through foreign institutional investors (FIIs) has gone up to 50.025 billion US dollars. The net inflow of FII investment in the year 2005 was 10.7 billion US dollars. The number of FIIs registered with SEBI till 2005 was 823, the number went up to 993 in 2006. Among the foreign financial investors registered with SEBI as FIIs are, pension funds, mutual funds, investment trusts, insurance or reinsurance companies, endowment and university funds and charitable trusts and societies. The data on the FIIs and their investments in India indicate the increasing stake of FII portfolio investments in Indian equity markets. Economic reforms, especially dismantling of controls on cross-border capital movements have in general paved the way for this huge capital inflow. At the same time path breaking technological advances in telecommunications and financial innovations have contributed to this phenomenon in a big way.

What has been observed is that while the overall capital inflow through the FIIs has been high, FII investments across firms have been quite dissimilar. The objective of this study is to analyse the determinants of FII investments in firms in high-tech corporate sectors like automobiles, drugs and pharmaceuticals, IT software and IT hardware for the period 2000 to 2004. In section II, we focus on the analytics of transnational holding of equity and motivation for the present study. In section III we discuss the hypothesis and the model. In section IV the estimation of the model and the empirical results are discussed. Section V presents the summary and conclusions.

II Analytics of Foreign Portfolio Investment

As per the theory of international portfolio investment (Solnik 1991; Sharpe et al. 1999) the basic motivation for any investor including the FIIs for investing in foreign equity is to diversify their

portfolio, reduce the diversifiable risk and earn higher returns. Essentially this is a two-step decision. The first step is the choice of the country. Having decided on the host country, the FII has to decide about the portfolio composition or portfolio choice within the country concerned. In taking the first step, since international investments involve returns in foreign currency, the same have to be factored in the analysis.

Consider an American investor buying stock of an Indian company. Let P_0 and P_1 be the stock prices at the beginning and end of the investing period respectively. The domestic return in India on this stock can be labelled R_d , which would be as follows:

$$R_d = (P_1 - P_0) / P_0 \quad (1)$$

For the foreign investor, the return would be R_f derived as follows:

$$R_f = (X_1 P_1 - X_0 P_0) / X_0 P_0 \quad (2)$$

Where, X_0 , X_1 denote the Rupee-Dollar exchange rate at the beginning and end of the investing period.

Any foreign equity investor simultaneously invests in the currency of the country whose stock is purchased and returns on currency R_c would be as follows:

$$R_c = (X_1 - X_0) / X_0 \quad (3)$$

From equations (1), (2) and (3) it can be shown that

$$1 + R_f = (1 + R_d)(1 + R_c) \text{ and } R_f = R_d + R_c + R_d R_c$$

Since the product of R_d and R_c would be small, both being percentages and less than 1.0, it can be concluded that R_f approximates to $(R_d + R_c)$. Taking variance of this approximation as a measure of risk to an international investor in domestic stock we have

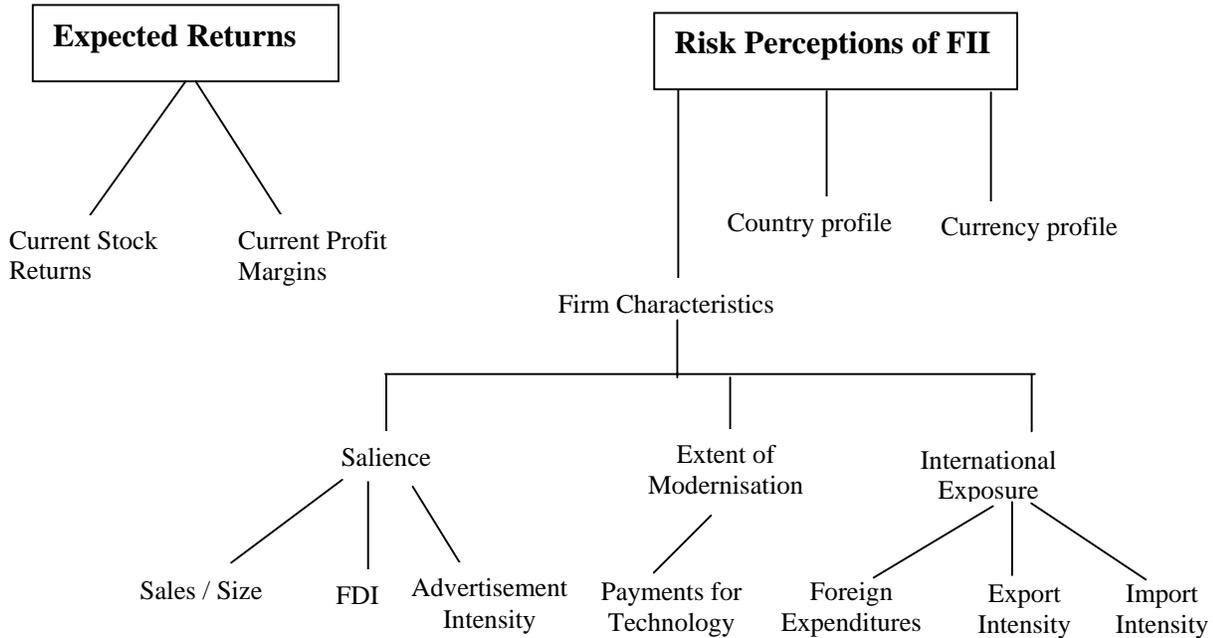
$$\text{Var}R_f = \text{Var}R_d + \text{Var}R_c + 2(\text{Correlation of } R_d \text{ and } R_c) (\text{Std.Deviation of } R_d) (\text{Std.Dev. of } R_c)$$

where, Var stands for variance of expected returns, as measure of risk.

Now, risk for a foreign investor would be determined among other things by correlation between domestic returns in the host country and returns on its currency, which can be very low or even negative. More importantly, since correlations between stock returns in different countries are lower than correlations among stock returns in the same country, investment in foreign assets can reduce the overall risk for an investor holding an internationally diversified portfolio.

The focus of the present paper is on the determinants of inter firm differences in FII portfolio investments. In other words, motivated by the objectives of risk reduction and return enhancement and having decided to have an internationally diversified portfolio, on which criteria does the foreign institutional investor choose the firms in which to invest.

In taking the second step of his decision namely, the choice of investment portfolio within the host country, the FII is guided by the well-known Markowitz theory of portfolio choice (Markowitz 1952, 1959) rooted in the mean-variance approach. This approach translates into expected return cum risk analysis. While expected returns can be inferred from current stock returns and current profits, along with these we list the factors which shape up the risk perceptions of a typical Foreign Institutional Investor after choice of the country has been made.



III Hypothesis and the Model

We argue in this paper that the capacity of the Indian firm to attract investment through FIIs will depend on its own salience, drive for modernisation and its international exposure.

III.1 Salience:

In an inter-firm study of a given industry, the capacity of the firm to attract investment through the equity market can be explained by using the “salience” approach (Tversky and Kahneman 1974; Shiller 1989). As per this approach, judgements of investors are likely to be influenced by the degree of salience or vividness with which a firm is perceived by them. We capture salience through three variables: Firm size as represented by sales turnover, equity participation by foreign promoters/partners (FDI), and advertisement intensity representing product differentiation and sales promotion.

Foreign Direct Investment and Joint Ventures:

We suggest that multinational affiliation as seen from FDI and joint ventures is an important feature that influences both the salience and unique risk characteristics of the firms. It has been

argued in literature that multinational enterprises and their affiliates (MNEs) form a separate strategic group within an industry (Caves 1996, pp 94-95; Dunning 1993; Kumar 1990). This is because they control and own proprietary assets like technology, brand names, managerial skills, goodwill and product and process patents which give them an advantage over the local firms (Caves 1971, 1974; Dunning 1981; Buckley and Casson 1976; Lall and Siddharthan 1982). The ownership of proprietary intangible assets gives them monopolistic advantages over domestic firms. In other words they internalise several of the advantages (Rugman and Verbeke 1992).

As a result of the ownership and internalisation advantages enjoyed by them, MNEs have been experiencing higher profit margins as compared to other firms. Several studies show higher profit margins enjoyed by MNEs after controlling for other variables that are likely to influence profits. For example Connor (1977) for Mexico and Brazil, Lacraw's (1983) for Southeast Asian countries, Kumar (1990) for India. We hypothesise a positive relationship between FDI and FII.

Some other studies have also analysed the relationship between FII and FDI but from a different perspective. For example, Goldstein and Razin (2006) concentrate on the volatility of FII compared to FDI and give possible reasons for FII's volatility and Wilkins (1999) uses a historical perspective to find out whether FII and FDI are complementary, substitutes or unrelated. None of the studies deal with firm level data and test the hypothesis that has been formulated in this paper.

Firm Size

Larger firms have several options to choose from with regard to the decisions on product mix, markets to serve, international diversification, technology acquisition and foreign partners that smaller firms do not have. In all these cases smaller firms have severe size and resource constraints that they could be at a disadvantage. In addition large firms have better visibility in terms of brand names and other intangible assets. Several studies have used firm size to analyse its impact on firms' performance like exports, growth and profits. Numerous studies have introduced firm size as a determinant of firm growth and profits (Buckley, Dunning & Pearce 1978; Rowthorn 1971; Siddharthan & Lall, 1982; Siddharthan, Pandit & Agarwal 1994; Cabral

1995; Das 1995; Variyam & Kraybill 1992; Shanmugam & Bhaduri 2002). Likewise quite a lot of studies have also reported a positive relationship between exports and firm size (Krugman 1990; Glejser, Jacquemin, & Petit 1980; Bonaccorsi 1992; Christensen et al 1987; Aggarwal 2002; Kumar & Siddharthan 1994; Patibandla 1995; Willmore 1992; Athukorala, Javasuriya, & Oczkowski 1995; Siddharthan & Nollen 2004). They attribute the effects of size on exports to superior information, greater risk-bearing capacity, lower unit cost, brand names, and pricing-setting power.

With regard to the influence of firm size on FII inflows, Dahlquist and Robertsson (2001), Covrig, Lau and Ng (2002), Kang and Stulz (1994), and Aggarwal, R., Klapper, L., Wysocki, P., (2005) found firm size important in explaining FII. We hypothesise a positive relationship between firm size and FII inflows.

Advertisement Intensity

Advertisement intensity is used to represent two features, namely, product differentiation and sales promotion, including promotion of brand names. Both these features influence salience positively. Product differentiation and brand names go together as brand names are less important for homogeneous products. In addition, product differentiation and brand names also contribute to market segmentation and there is evidence that it promotes FII inflows.

III.2 International Orientation

Earlier studies (Kang and Stulz 1994; Aggarwal, Klapper and Wysocki 2005) have shown that managers of foreign institutions prefer to invest in firms about which they are familiar. Some studies also show that fund managers invest in firms that have exports or foreign sales (Covrig and Ng 2002; Kang and Stulz 1994). We have considered three variables to denote international orientation.

Foreign Expenditures, expenditures abroad as a percentage of total sales turnover. They are mainly incurred to establish branches and selling units abroad. Acquisitions of foreign firms are also included under this category. These expenditures contribute to the visibility of the Indian firm in the international market and increase its familiarity to foreign institutions.

Export Intensity, exports to sales ratio. This variable yet again contributes to international visibility and increases familiarity.

Import Intensity, imports to sales ratio.

III.3 Extent of Modernisation

FII's are likely to favour firms that have an active modernisation and technological up-gradation programme. Some technology is transferred intra-firm through FDI. Technology can also be transferred through the market to unaffiliated third parties. Proprietary technology like patents, designs and drawings, etc., can be licensed against lump-sum and royalty payments. We have already FDI under the salience section and we propose to introduce inter-firm transfer of technology here. Technology transfer against royalty and other payments will also cover long term non-equity strategic alliances entered into by the Indian firms with foreign firms. These are more enduring than arms length purchase of technology. The non-equity strategic alliances also contribute to the exposure of Indian firms in the international arena. As in the case of other variables, payment for technology is also considered as a ratio of sales turnover.

III.4 Expected Returns

We have considered two variables to indicate expected returns: annual stock returns and profit margins. Stock returns include dividends and changes in equity prices. Profit margins are gross profits as a ratio of sales turnover. Rai and Bhanumurthy (2004) for a study based on monthly FII flows into India (at an aggregate level) found stock returns an important determinant. Coondoo, and Mukherjee (2004) based on a time series of daily observations of aggregate FII flows into India found stock returns important. Aggarwal, Klapper and Wysocki (2005) have also introduced stock returns as an explanatory variable and found it important. In addition to annual stock returns we have also introduced profit margins as an additional indicator of returns. Higher profit margins could indicate market concentration and a more dominant role of the firm.

In the next section we estimate the following equation:

All the variables are at the firm level.

$$FII_{it} = \beta_1 SR_{it} + \beta_2 FDI_{it} + \beta_3 SALES_{it} + \beta_4 ADS_{it} + \beta_5 XS_{it} + \beta_6 MS_{it} + \beta_7 TPS_{it} + \beta_8 FPS_{it} + \beta_9 PRM_{it} + v$$

Where, i refers to the firm; and t to time.

FII is foreign institutional investments, foreign institutional equity as a percentage of total equity (paid-up) capital of the firm.

SR is the stock return

FDI is foreign direct investments, is a dummy variables that takes the value 1 for firms where foreign promoters equity is more than 25 per cent of the total equity and 0 otherwise.

SALES is the total sales turnover of the firm.

ADS is advertisement expenditures as a ratio of sales turnover.

XS is exports to sales turnover ratio.

MS is imports to sales turnover ratio.

TP is technology payments to sales ratio, it refers to payments made to purchase technology and royalty payments.

FPS is payments made in foreign exchange excluding imports and technology payments. They mainly refer to expenditures relating to setting-up of sales offices, branches, acquisitions of foreign firms and other related expenditures made overseas.

PRM is the profit margin, gross profits to sales ratio.

IV ESTIMATION OF THE MODEL AND STATISTICAL RESULTS

For estimating the model we have used panel data for five years 2000 to 2004 (both years included) and considered firms from four industries – drugs and pharmaceuticals, automobiles, information technology software, and information technology hardware (this also includes electronic components related to IT hardware). We have considered 72 firms under drugs and pharmaceuticals (total balanced panel observations 360), 62 firms under automobiles, 65 firms under IT software, and 24 firms under IT hardware and electronics. All the data are from Capital Line data set and are for the financial year ending March 31. Table 1 presents the Generalised Least Squares estimates with cross section weights for the balanced panel corrected for Heteroskedasticity.

Table 1
 Determinants of Inter-Firm Differences in Foreign Institutional Investments
 GLS Fixed effect estimates, (cross section weights, balanced panel) corrected for
 Heteroskedasticity
 Dependent Variable: Foreign Institutional Investments

Industry/ Ind. Variabales	Drugs and Pharmaceuticals	Automobiles	IT-Software	IT- Hardware#	IT- Hardware#
Stock Return 't'	0.000561*** (3.01)	0.000135*** (2.38)	0.000658*** (8.09)	0.0075* (1.82)	0.0075* (1.95)
FDI (Dummy)	0.010933 (0.07)	0.184572*** (6.53)	- 0.373168*** (-7.21)	5.7892*** (2.66)	4.6426*** (2.84)
L Sales	1.718894*** (15.65)	1.056188*** (11.78)	0.860375*** (11.00)	3.9624** (2.29)	4.0026*** (2.89)
Advertisement Intensity	-0.031942*** (-3.13)	1.761042*** (4.84)	-0.57532*** (-3.99)	26.3594 (1.52)	27.2354 (1.42)
Exports intensity	0.008485*** (7.12)	0.894765*** (8.77)	0.921380*** (2.76)	- 31.2852** (-2.30)	- 32.0292** (-2.47)
Import intensity	-0.674272*** (-2.69)	3.882883*** (8.12)	1.324571* (1.90)	-0.2065 (-0.14)	
Technology Payments	0.179152*** (4.50)	6.889300*** (7.63)	0.064042 (1.51)	-10.5010 (-1.64)	
Foreign Expenditures	0.732413*** (2.58)	- 7.045393*** (-13.45)	0.728115*** (12.82)	-0.1053 (-0.08)	
Profit Margins	0.210454*** (4.12)	0.007770 (0.06)	0.055619*** (2.64)	-0.0700 (-0.12)	
R ² (Weighted Statistics)	0.6210***	0.9787***	0.8262***	0.7060***	0.6973***
NOBS	360	310	260	70	70

#Balanced Panel without cross section weights. There are only 14 firms and given the small sample size weights could not be used.

The results presented in Table 1 are in expected line except for a few industry specific reasons. Stock return as anticipated emerged significant in the case of all the four industries. Therefore, given other things, stock returns are important and FIIs will not invest in a firm where stock returns are low.

FDI dummy is positive and significant at 1% level for two industries – automobiles and IT hardware. It is not important in the case of drugs and pharmaceuticals. This is mainly because, till recently, the Indian patent laws were not in accordance with the international practice. In particular, India did not allow product patenting and allowed only process patenting in drugs. However, recently India has changed its patent laws in accordance with the WTO regulations. The result for the IT software industry is even more worth noting. The coefficient of FDI is negative and significant. It denotes a strong preference for the FIIs to favour the Indian firms. This result is not unexpected as the major giants in the software are mainly Indian firms like Tata Consultancy, Infosys, Wipro and Satyam. These Indian firms have also a significant presence in the US and EU markets and are considered global leaders. The behaviour of advertisement intensity is also similar to that of the FDI variable. It is significant and positive for automobiles and negative for drugs and IT software. There is evidence to show that multinationals advertise more and are more conscious of their brand name compared to local firms and these two sectors are not dominated by FDI and hence the negative coefficient for the two industries.

Log Sales has a positive sign and is significant in all the equations indicating the preference of FIIs for larger firms. This result is also in conformity with the earlier studies discussed earlier.

The coefficient of export intensity was significant and positive for drugs and pharmaceuticals, automobiles, and IT software. All these three industries have been doing exceptionally well in the export market and have established their presence globally. However, for the IT hardware the sign of the coefficient is negative. This is not a surprise as the Indian hardware is not globally competitive and the firms produce mainly for domestic consumption. The coefficient of import intensity, as expected, is positive for automobiles and IT software. But it is negative for the drugs and pharmaceuticals. In this industry the leading firms are not import intensive and the import content is very low. The import intensive firms are not the leading manufacturers. Technology payments have emerged significant for drugs and pharmaceuticals and automobiles. The variable is not significant for the IT sector, as that sector has not been importing technology in a noteworthy manner. Expenditures incurred abroad for acquisitions and establishing branches and offices have emerged significant for drugs and pharmaceuticals, and

IT software, two sectors that have been very active in acquisitions and establishing branches unlike the automobiles sector. In recent years some of the Indian auto firms have been investing abroad and acquiring Korean firms. Nonetheless, this new phenomenon is yet to get reflected in the data. Profit margins have materialised as significant determinants for firms producing drugs and pharmaceuticals, and IT software. These are the two important globally competitive sectors. In the case of automobiles, the profit margins are low mainly due to excess domestic competition and overcrowding.

V CONCLUSIONS

In recent times, Indian economy has experienced a big surge in portfolio capital inflows by FIIs. While the overall inflows have been high, FII investments across firms have been quite dissimilar. The present study is an attempt to explain the inter-firm differences in investments through FIIs in India's high-tech sectors like automobiles, drugs and pharmaceuticals, IT software and IT hardware including electronics, for the period 2000 to 2004, with both the years including.

The basic premise of the theory of foreign portfolio investment is that such investments are based on a two-step decision—the choice of the country cum currency and the choice of the firm in which the portfolio investment is made. Guided by considerations of earning higher expected profits and lowering the risks, the FIIs go in for international portfolio diversification. In taking the first step of their decision process, country risks and the currency risks are taken into account. Having done that, the FIIs have to choose the firms in which to invest. This is the second step of the decision making process. The objective of the present study is to tackle this question as to which considerations determine the portfolio choice of the FIIs in a given country.

In identifying the determinants of investments by FIIs in the incorporated firms, the present study uses the well-known mean-variance approach. The mean or expected returns are inferred from profit margins and current stock returns. The variances of returns shaping up the risk perceptions of FIIs are associated with firm characteristics along with country cum currency profile. Across firms, the three major distinguishing features are salience of a firm within an industry, extent of its modernisation and its international exposure. The salience or vividness

with which a firm is perceived by foreign investors is captured by firm size, magnitude of FDI in the firm and its advertisement intensity. Since technological change is the main driving force for growth of firms, the FIIs are also concerned about the extent of modernisation of a firm's technology. Finally, the FIIs would also take into account the international exposure of a firm, which in itself is associated with factors like foreign expenditures by a firm in sales promotion and acquisition, and also its export and import intensities.

The panel data (GLS) estimation is conducted using Fixed Effect techniques corrected for Heteroskedasticity. The results are broadly along expected lines. Stock returns turns out to be a significant determinant of FII investments. The FDI dummy is positive and significant for automobiles and IT hardware. It is not significant for the drugs and pharmaceutical firms for the reason that till recently, India did not allow product patenting and allowed only process patenting. Such laws have only recently been changed under WTO regulations. For IT software, the FDI variable is negative and significant. It shows the strong preference of the FIIs for the Indian software firms, which are now internationally recognised leading firms. The behaviour of advertisement intensity is similar to that of FDI dummy. The size variable turns out to be significant for all the sectors implying that the FIIs prefer larger firms. Export and import intensity variables are significant in some sectors. In others industry specific effects largely explain their behaviour. Payments for imported technology are significant for all sectors except IT, which has not been importing technology. Expenditures incurred abroad for acquisitions and branch establishment have been significant in drugs and pharmaceuticals and IT. Profit margins have found to be significant into globally competitive sectors, which is IT software and drugs and pharmaceuticals.

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