Research Article   **Open Access**

Exchange Rate Exposure of Indian Firms Using Capital Market Approach

Prasad K[1]* and Suprabha KR[2]

[1]*Justice K. S. Hegde Institute of Management, Nitte, Udupi, India*
[2]*Department of Humanities, Social Sciences and Management, National Institute of Technology Karnataka, India*

Abstract

The unintuitive movement in the exchange rates will expose the firms involved in international trade to exchange rate exposure. The exchange rate exposure cannot be eliminated; however, it can be effectively managed. Currency derivatives are extensively used to manage the short term exposures and strategic decisions to manage the long term exposures. The past researches conducted on exchange rate exposure management indicate that managing the exchange rate exposures will increase the value of the firm. Therefore, no firms involved in global trade could afford to demine the importance of managing exchange rate exposures. The present research attempts to measure the level of exchange rate exposure of the firms in India. A sample of 76 non-financial companies listed in CNX100 index of NSE was selected as sample and the data for a period of one year is being studied. The results of the study are 21 percent of the sample firms are significantly exposed to foreign exchange risk out of which 25 percent had positive coefficients and 75 percent of the firms had negative coefficients. 57 percent of the firms from Software and IT industry and 15 percent of the firms from mining, refinery and petroleum industry were significantly exposed to foreign exchange risk. JEL Code: F31

Keywords: Exchange rate exposure; Currency derivatives; Value of the firm; International trade

Introduction

Financial exposures and risks faced by the firms influence the value in many direct and indirect ways. Typically, these exposures are created as a result of unexpected changes in exchange rates, interest rates, and commodity prices. The term risk and exposure is often interchangeably used, but there is a subtle difference between the two. Risk refers to the probability of a loss, whereas exposure is the possibility of a loss. Risk arises from the exposure or exposure precedes risk. When a firm has financial market exposure, there is a possibility of loss nevertheless an opportunity for gain or profit [1]. Therefore it is not possible to eliminate the exposure or risk as there is a linear relationship between risk and returns. But the firms can manage these risks by deploying proper risk management techniques in other words firms can hedge these exposures.

The fact that a significant number of corporations are committing resources to risk management (financial hedging) activities indicates the role for risk management in increasing the firm value [2]. Besides increasing the value of the firm, it also provides greater consistency to the firms earnings and reduces the cost of capital [3,4].

The present research intends to study the level exchange rate exposure of the firms in India. Exchange rate exposure is the uncertainty created by the unintuitive movement in the exchange rates between the currencies. Hekman [5] defined exchange rate exposure (referred as FX exposure hereafter) as "the sensitivity of its economic value, or stock price, to exchange rate changes". The foreign exchange rate exposure is created by firm's transactions such as, import, export, borrowing, lending, subsidiaries in foreign country, royalty income/expense and so on. This exposure so created brings in the probability of loss, which is called as foreign exchange rate risk. This is a unique risk attached with the international trade, i.e. when firms operate in more than one country.

The international trade has significantly grown following the Second World War. Large number of corporations started exploring the opportunities in the foreign countries as a part of their expansion strategy. Indeed, the global trade was vital in success of many businesses. The political environment post the Second World War was stable and conducive enough to do so and more importantly creation of World Trade Organization, World Bank etc. made the international business much easier. In the Indian context, after the liberalization of Indian economy in the year 1991 opened windows for global business in India, many global multi-national corporations (MNCs) entered Indian markets; similarly, many Indian companies cashed this opportunity to enter foreign countries. Because of this the firms were exposed to a FX risk which was not there when they were operating in the domestic country. However the magnitude of FX risk was very less, with the operation of Bretton Woods Agreement signed by most of the economically powerful countries in the year 1944. With the fall of Bretton Woods System and introduction of flexible exchange rate regime in the year 1972, the movement of the exchange rates became very volatile as the exchange rate between the currencies of two countries was determined by market forces. This development in the global economy, lead to the increased importance to FX risk management. The past researches conducted on FX risk management and firm value indicates the managing the FX risks will increase the value of the firm [6-8]. Therefore, no firms involved in global trade could afford to demine the importance of managing FX exposures.

Literature Review

The existing literature categorizes FX exposures into three types. First, transaction exposure, which is created by the transactions of the firm involving cash flows such as, import, export, payment/receipt of interest, royalty etc. this exposure is quite serious as this will affect the firms cash flows directly. Translation exposure is the second type of FX

exposure. It is also called as accounting exposure, as it is created when the financial statements of the subsidiaries are consolidated with that of parent company. However, this will not affect the cash flows of the company. The third type of exposure is known as economic exposure. It means that the unexpected change in the exchange rates may adversely affect the cash flows of the firm in the future. The difference between transaction exposure and economic exposure is that, transaction exposure disturbs the present cash flows while, economic exposure is a long term risk [9].

The transaction exposure can be affectively minimized by hedging. There are various tools used for hedging transaction exposure they are, financial instruments such as currency options, currency futures, cross currency swaps or non-financial techniques such as natural hedging, parallel loans and invoice currency can be deployed in management this exposure.

The translation or balance sheet exposure is hedged very infrequently and non-systematically as it has much to do with the regulators governing the firm's accounting policies [10]. Moreover firms don't worry too much about this exposure as it has no implications on the cash flow.

Economic risk is often hedged as a residual risk. Firms may find it difficult to measure and hedge this exposure since it largely depends on the political and economic conditions prevailing which at time becomes unpredictable. Though, strategies for hedging economic exposure have been investigated widely in the previous finance literature. Srinivasulu [11], Aggarwal and Soenen [12] and Lessard and Lightstone [13] argue that economic exposure should be managed strategically, by developing production plants or sourcing in countries whose currencies are undervalued. Further, Kanas [14] demonstrated how a financial instrument such as currency option can be used to hedge economic exposure effectively. It is said that, by managing today's economic exposure, the shape of tomorrow's transaction and translation exposure can be changed and even much reduced [15]. From the aforesaid discussion it can be concluded that transaction exposure can be managed, while, translation exposure is an accounting related issue and do not affect the firm's current cash flow. Economic exposure being the residual risk affects the long term cash flows of the firm, thus affects the value of the firm.

The derivatives are extensively used to manage transaction exposure. According to Modigliani and Miller [16] it is useless for a firm to reduce risk by using derivatives under perfect capital market conditions. While, the evidence provided by Stulz [17] and Smith and Stulz [18] had revealed that, under certain market frictions, corporations having specific operating characteristics like, higher financial distress costs, tax convexity, growth opportunities, managerial holdings and liquidity constraints, have an opportunity to enhance firm value by optimally utilizing hedging techniques. Supporting this, the empirical results of study by Chang [19] pointed out how hedging will play an effective role in helping corporations to manage adverse outcomes of exchange rate risks. The surveys of the past study such as Bodnar and Gebhardt [20]; Bodnar et al. [21]; Prevost et al. [22]; De Ceuster et al. [23] suggests that, firms actively manage FX risk using internal and external (derivatives) instruments. Then again, there are no real long term derivatives available (except currency swaps) to hedge the economic exposure. As the cash flows of the firm are not constant, the currency swaps cannot be used to hedge the aforesaid exposure.

Risk management is a costly activity and it should add value to the firm [1]. There are many empirical studies which have examined the relationship between FX exposure and firm value, but their results have been mixed. Bartov and Bodnar [24]; Choi and Prasad [25]; Jorion [26,27] found that firm value is insensitive to the exchange rate fluctuations. However the studies of He and Ng [28]; Bodnar and Gentry [29]; Booth and Rotenberg [30] found that exchange rate movement has a significant impact on the firm value. As said previously, the fact that large number of firms involving in the FX exposure management, we may say it has a positive impact on the firm value. The firm value will increase only when the exposure is managed systematically.

The prior researches list the steps to be followed in FX exposure management. McGann and Shade [31] identified three important steps in FX exposure management. Firstly, awareness of what is happening in the global economy and how they might affect the exchange rates. Secondly, well-reasoned policy and procedures to guide foreign exchange activities and lastly, understanding the hedging methodologies.

A survey conducted by Wallace [32] in US, identified the seven best FX exposure management practices followed by the large successful companies. They are, written FX policies, centralize the FX management with their parent treasury, sufficient systems to be able to track underlying business exposures being hedged, frequently mark-to-market their FX positions, separate back office operations from trading, uniform book exchange rates and foreign exchange accounting practices, independent risk oversight. Perhaps, this sums up the whole process involved in FX exposure management. However, the management of the firm should decide the suitable technique considering the risk tolerance and cost of risk management [33]. Therefore the perception of the management about the risks becomes critical in management of FX exposure [34,35]. The suitable strategies in managing FX exposure by the firm can be taken when the factors affecting the exposure is clearly understood.

The major factors affecting the level FX exposure of the firms are, size of the firm, breadth of the firm's presence abroad, depth of the firm's presence abroad, percentage of foreign sales, percentage of foreign assets, percentage of operating net profit and firm's risk [19]. The current research focuses on measurement of level of foreign exchange rate exposure of Indian firms.

Methodology

This study focuses on the measuring the level of economic exposure of the firms in India. We employ a simple two factor model to estimate the economic exposure sensitivity coefficient of individual firms. A two factor model, where R_{it}, the return on company i's stock at time t. R_{mt} is the market return of the market and e_{it} is the exchange risk factor. This model can be described as below:

$$R_{it} = \alpha + \beta_1 e_{it} + \beta_2 R_{mt} + v_{it}$$

From the above regression model, coefficients β_1 and β_2 provide the measure of exchange rate exposure and market risk of the firm i, v_{it} is the error term. The similar equation is employed by Adler and Dumas [36]; Bodnar and Gentry [29] and Jorion [26]. We use this model to examine the null hypothesis that the exchange rate fluctuations have no effect on stock returns i.e. H_O: $\beta_1 = 0$. The alternate hypothesis is H_1: $\beta_1 = 0$. The sign of exchange rate coefficient can be positive or negative depending on the foreign currency cash flows of the firm. For example, the firm with foreign currency payable will benefit from

Rupee appreciation as the firm's cost in terms of Rupees would come down due to the appreciation in domestic currency. Conversely, firms with foreign currency receivables would benefit from the Rupees appreciation against foreign currency, as the cash inflow in terms of Rupees would increase because of the depreciating Rupees.

The 76 non-financial companies constituted in CNX 100 index of National Stock Exchange (NSE) is chosen as the sample for this study. CNX 100 is the broad market index of NSE which accounts for about 82 percent of the market capitalization of NSE. The daily stock price information starting for a period of one year starting from1st, April 2012 to 31st March 2013 of the sample companies is taken from the NSE website and the daily returns of these companies are computed (R_{it}), which is the dependent variable of this study. The daily fluctuations of the Nominal Effective Exchange Rate (NEER) index (e_{it}) and the daily returns of the CNX100 index (R_{mt}) for the same period are computed, which are the independent variables in this study.

The returns of the firm i for each period t was computed as equation given below:

$$R_{it} = \frac{\Delta P_t}{P_{t-1}}$$

Where,

ΔP_t = change in price of firm i for period t,

P_{t-1} = previous days price of firm i,

Similarly, the daily return of the NEER index and the CNX 100 index is computed.

Empirical Results

The Table 1 represents the industry of the sample firms. The sample firms chosen were from different industries. The firms from Mining, Refinery and Petroleum industry were highest with 17.11 percent of the total sample and Alcohol and Textile companies being the lowest at 2.63 percent each of the total samples.

The Table 2 presents the regression results of firms' exposure to the exchange rate. The 16 firms out of 76 sample firms were significantly exposed to the exchange rate exposure. Of firms significantly exposed to the exchange rate exposure 25 percent benefit from the depreciation of Rupees. The others have negative exchange rate exposure coefficients. A positive coefficients indicates that firms experience increase in stock

returns when the Rupees depreciates against the foreign currency, while negative coefficients indicates that the firms experience the decrease in the stock returns when the Rupees appreciates against the basket of foreign currencies. During the study period the Rupee depreciated by 1.5 percent against basket of 36 currencies used to construct NEER index.

The results of the individual firms exposed to exchange rate exposure are given in Table 3.

From the above results we can observe that four out of seven software and IT firms are significantly exposed to the exchange rate exposure. Two firms each from Mining, Refinery and Petroleum and infrastructure industry are significantly exposed to exchange rate risk. While the metal none of the sample companies from metal, alcohol and textiles industry are significantly exposed. The interesting fact is that all the firms significantly exposed to exchange rate risk in software and IT industry has a negative coefficient which means they are not benefited from the Rupee depreciation. This is seems to be quite unusual knowing the fact that most of Indian IT firms are having foreign currency inflows. The firms in the mining, refinery and petrochemical industry too had negative coefficient which is expected and attributed to the import of crude and other energy sources. Further, the negative exposure of the firms suggests that these firms face a greater exposure in their cost side and lose when Rupee depreciates.

The fact that we find returns of large percentage of firms is not significantly sensitive to exchange rate exposure is not inconsistent with the prior studies. A fundamental question of our study is to find that exchange rate fluctuations like any other macro-economic factors should have varying effect on the firm value. We put forth the argument that the variations in the exchange rate exposure of firm are the refection of differences in firm specific economic, operational and policy variables.

Conclusion

The study examined the exchange rate exposure of the non-financial firms constituted in CNX 100 index of NSE. The daily data for the period of one year was analyzed. The findings of the study are that, 21 percent of the sample firms are significantly exposed to foreign exchange risk out of which 25 percent had positive coefficients and 75 percent of the firms had negative coefficients. 57 percent of the firms from Software and IT industry and 15 percent of the firms from mining, refinery and petroleum industry were significantly exposed to foreign exchange risk. In spite of these large firms employing exchange risk management techniques such as balance sheet hedging, use of derivatives and natural hedging techniques, we find still exchange rate risk impacts the value of good number of firms. The shortcoming of this study such as, this is based explicitly on a model of firm behavior, so it is difficult to interpret their findings of low exposure in terms of economic behavior provides the good scope for further studies.

Industry	N	Percentage
Automobile	7	9.21
Beer and alcohol	2	2.63
Cement	3	3.95
FMCG	8	10.53
Heavy Engineering	5	6.58
Infrastructure	8	10.53
Software and IT	7	9.21
Metal	5	6.58
Mining, Refinery and Petroleum	13	17.11
Pharmaceuticals and Healthcare	9	11.84
Telecom	3	3.95
Textiles	2	2.63
Others	4	5.26
Total	76	100

Table 1: Classification of firms-industry-wise.

Significant Exposure (% Total Firms)	16 (21%)
Positive Exposure (% Significant)*	04 (25%)
Negative Exposure (% Significant)*	12 (75%)
*Significant at the 0.05 level.	

Table 2: Exchange rate exposure of firms.

Firm	Industry	Mean	Adj.R²	Constant	Coefficient	F-Stat	Sig.*
Bharat Heavy Electricals Ltd.	Heavy Engineering	-0.26	0.362	-0.272	0.456	2.081	0.039
Bharat Petroleum Corpn. Ltd.	Mining, Refinery and Petroleum	-0.14	0.046	-0.174	-0.875	-1.896	0.045
Bharti Airtel Ltd.	Telecom	-0.15	0.13	-0.153	0.564	2.339	0.002
Bosch Ltd.	Automobile	0.02	0.102	0.025	0.340	2.629	0.009
D L F Ltd.	Others	0.05	0.388	0.4	0.908	3.787	0.001
Divi'S Laboratories Ltd.	Pharmaceuticals and Healthcare	0.09	0.217	0.073	-0.347	-1.768	0.048
G A I L (India) Ltd.	Mining, Refinery and Petroleum	-0.08	0.169	-0.085	-0.510	-2.601	0.01
H C L Technologies Ltd.	Software and IT	0.21	0.192	0.192	-0.325	-1.897	0.044
Hindustan Unilever Ltd.	FMCG	0.10	0.092	0.086	0.420	2.374	0.018
Idea Cellular Ltd.	Telecom	-0.03	0.103	-0.025	0.730	3	0.030
Infosys Ltd.	Software and IT	0.05	0.11	0.03	-0.423	-1.859	0.050
N T P C Ltd.	Infrastructure	-0.08	0.175	-0.088	0.298	1.975	0.050
Power Grid Corpn. of India Ltd.	Infrastructure	-0.03	0.216	-0.047	-0.365	-2.432	0.016
Tata Consultancy Services Ltd.	Software and IT	0.20	0.275	0.184	-0.455	-2.318	0.021
Ultratech Cement Ltd.	Cement	0.09	0.12	0.095	0.386	2.273	0.024
Wipro Ltd.	Software and IT	0.03	0.122	0.012	-0.332	-1.801	0.048
*Significant at the 0.05 level.							

Table 3: Firms exposure to exchange rates.

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