Foreign Currency Denominated Debt as A Hedging tool for Foreign Exchange Rate Risk Exposure

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ABSTRACT

This study examines the foreign exchange exposure of Indian nonfinancial firms and its Foreign exchange exposure management by using foreign currency denominated debt (FDD). A sample of 86 Indian non financial firms is examined by this study for a period from 2006 to 2012. A two stage cross sectional regression frame work is used to test the main hypothesis of foreign exchange rate exposure that can be effectively hedged by FDD. The study has found statistically significant evidence that the use of FDD is effective hedging tools for reducing currency exposure of Indian nonfinancial firms.

Keywords: Foreign exchange, Exposure, Risk, Hedging, Foreign debt

INTRODUCTION:

Corporate firms have been facing risk and uncertainty due to foreign exchange rate fluctuations. The risk emanated from an unexpected change in foreign exchange rate in the value of acorporate firm is referred as foreign exchange rate exposure. However empirical studies at international levels reported that foreign exchange rate fluctuations do not much affect the corporate firms (Al-Shboul & Alison, 2009; Choi & Prasad, 1995; Jorion, 1990; Fraser & Pantazalis,2004). One of the probable reasons for that the companies are themselves covering such risk by way of natural as well as external hedging activities. Empirical studies(Allayannis & Ofek, 2001; Al-Shboul & Alison, 2009; Chiang & Lin, 2005; Clark & Mefteh, 2011a) are reported foreign currency derivatives and foreign currency denominated debt are two major financial instruments which are effectively reduces the risk arising from an unexpected foreign exchange rate fluctuations. This study tries to examine whether the foreign exchange rate changes have affected the value of Indian corporate firms and the use of foreign currency denominated debt (FDD) as a financial hedging strategy is effective to hedge the foreign exchange risk of Indian corporate firms.

A sample of 86 Indian non financialcompanies was analysed to test the main hypothesis that foreign exchange exposure would be reduced by the use of the foreign currency denominated debts by adopting a two stage cross sectional regression framework. Monthly time series data for six years starting from April, 2006 to March 2012 was used in first stage for estimating foreign exchange rate exposure of Indian firms individually. Such estimated coefficient of foreign exchange exposure was employed as a response variable in the second stage regression where this study uses hedging variables as predictor variable to test the hypothesis of foreign currency risk will be effectively managed by hedging strategy of FDD.

The outcome of this study reports that there is very less number of companies found statistically affected by the foreign exchange rate changes, which indicate that the Indian corporate firms are effectively managing foreign exchange rate exchanges. Further this study evidenced that the use of financial hedging strategy, FDD can effectively reduces the foreign exchange rate exposure.

Remaining part of this chapter is as follows. Next section deals with review of literature. Third section describes the data and sample selection procedure. Fourth section of this study explains the methodology of the study. Fifth section analyses the results and discussion and final section concludes the study.

REVIEW OF LITERATURE:

Many empirical studies were explored in the area of foreign currency risk and its management. A two factor model by Jorion(1990) in which he regressed the stock return of corporate firms by two independent variables, via foreign exchange rate variable and market return variable for controlling other factors which affect the stock return of a company. Jorion(1990) model has been extensively used by number of researchers in different and most of the studies reported a weak relationship between firms value or stock return and foreign exchange rate (Allayannis & Ofek, 2001; Al-Shboul & Alison, 2009; Choi & Prasad, 1995; Jorion, 1990; Junior, 2011; Kanagaraj & Sikarwar, 2011; Kiymaz, 2003; Hoa Nguyen & Faff, 2003). Researchers argued that the reason for weak foreign exchange exposure of firms is that the corporate firms were themselves managing such risk by using financial instruments like foreign currency derivatives (Allayannis & Ofek, 2001; Al-Shboul & Alison, 2009; Anderson, Makar, & Huffman, 2004; Chiang & Lin, 2005; Makar & Huffman, 2001; Hoa Nguyen & Faff, 2003) and the foreign currency denominated debt (T Aabo, Hansen, & Muradoglu, 2011; Tom Aabo, 2006; Bae & Kwon, 2011; Elliott, Huffman, & Makar, 2003; Junior, 2011; Karlsson & Palm, 2012; S Kedia & Mozumdar, 2003) Many studies in different countries are giving different evidences of this conjecture. Some studies are supporting this conjecture that use of these two hedging strategies is negatively related to foreign exchange rate exposure.

Several studies(T Aabo et al., 2011; Tom Aabo, 2006; Allayannis & Ofek, 2001; Cho & Song, 2011; Elliott et al., 2003; Karlsson & Palm, 2012; Simi Kedia & Mozumdar, 2003) gave a strong evidence for the notion that there is a negative association between foreign exchange exposure and foreign currency denominated debt use. However studies contributed by (Chiang & Lin, 2005; Monshi, Ismail, & Shaharuddin, 2011.; Hoa Nguyen & Faff, 2006)stated that there is no significant evidence to support the notion of use of foreign debt to alleviate currency risk. Earlier researchers added some hedging incentive variables like foreign involvement proxies by ratio of foreign sales to total sales, firm size, leverage and liquidity etc., in to the cross sectional regression models, which are also determined the foreign exchange exposure of a firm. (Allayannis & Ofek, 2001; Allayannis & Weston, 2001; Al-Shboul & Alison, 2009; Chiang & Lin, 2005; Elliott et al., 2003; Jorion, 1990; Hoa Nguyen et al., 2007, Anderson et al., 2004; Kanagaraj & Sikarwar, 2011) The following table shows some of the earlier studies which used different variables in their cross sectional regression and their reported sign to the foreign exchange rate exposure.

Table 1: Earlier Studies of Relationship Between Foreign Currency Denominated Debt and Foreign Exchange Exposure

S. N.	Name of Author(s) (year)	Model	Sign of hedging strategies	Sign of control variables			
			FDD	FS/TS	Size	LEV	LIQ
1	Junior(2011)	OLS	-ve*	+ve	+ve	No	No
2	Hoa Nguyen & Faff (2006)	OLS	_ve	_ve*	-ve	No	-ve
3	Bae & Kwon (2011)	OLS	_ve	+ve	-ve	No	No
4	Monshi et al, (2011)	OLS	-ve	+ve	+ve	No	No
5	Chiang & Lin (2005)	OLS	+ve	+ve*	-ve	NO	NO
6	Hoa Nguyen & Faff (2003)	OLS	No	+ve	-ve*	+ve	+ve
7	Hoa Nguyen et al., (2007)	OLS	No	-ve	+ve	-ve	-ve
8	Al-Shboul & Alison (2009)	WLS	-ve*	-ve	+ve*	-ve*	-ve
9	Allayannis & Ofek (2001)	OLS	-ve*	+ve*	No	No	No
10	Clark & Mefteh (2011)	OLS	+ve	+ve	-ve	No	No

From the above review of literature, two research issues are concern to this study. First, it was clear that the earlier foreign exchange exposure studies reported weak evidence of exposure in their respective studies in different countries. They all used two factor model of foreign exchange exposure. Hence this study first considers whether the Indian companies are in line of the literature or not. Second issue is that the use of foreign currency denominated debt to manage foreign exchange exposure studies also giving contradictory evidence in different countries. Hence researcher indents to carry out an investigation in that line too. Further up to the knowledge of author, there is no Indian study so far published whether this conjecture is working in Indian firms or not. This study is an attempt in that line to explore foreign exchange rate risk practices of Indian corporate firms.

DATA AND SAMPLE FIRMS:

This study draw a sample of non financial firms which is sourced from the major index of India, S&P CNX 200 index from the National Stock Exchange of India Ltd.It represents about 88.32% of the free float market capitalization of the stocks listed on NSE as on March 28, 2013 and is a true reflection of the Indian stock market and Indian corporate firms . Since the main interest of this study is hedging strategies of use of foreign currency derivatives and foreign denominated debt on exchange rate exposure of Indian firms, three specific selection criteria were applied to get the number of firms in the sample:

1. Excluded financial firms, because most of them were also market-makers in financial instruments; hence, their motivation for using financial instruments could be very different from that of the non financial firms.
2. The company should have disclosed information about its use of foreign currency denominated debt in its annual report during the period 2006-2012.
3. The company should have disclosed information about foreign sales in its financial statements throughout the period of 2006-2012.

Based on above criteria the following sample firms were selected:

- **All non financial firms:** According to the first criteria, 28 banks and 14 financial institutions are excluded that left a sample of 158 non financial companies.
- **FDD user firms:** out of 158 non financial firms 105 firms reported the use of foreign denominated debt. But some companies not reported foreign sales, this leave to us a final sample of 86 firms

The sample period of study was six years from 2006 to 2012. This study used FDDT as a hedging strategy, is the average year end amount of foreign currency denominated debt for the study period. The year end notional amount of foreign currency denominated debt are gathered from annual report of each sample firm and annual foreign sales data were collected from the database of CMIE Prowess for the period from 2006 to 2012. Foreign currency denominated debt includes foreign currency borrowing, Euro convertible bonds and External commercial borrowings. Stock return data of each firm and market portfolio index of CNX S&P200 were collected from NSE website. Foreign exchange rate of INR versus USD is collected from Business Beacon database of CMIE. Other control variables used in this study are also collected from CMIE Prowess database.

METHODOLOGY:

This study follows the methodology adopted by earlier studies (Allayannis & Ofek, 2001; Allayannis & Weston, 2001; Al-Shboul & Alison, 2009; Anderson et al., 2004; Chiang & Lin, 2005; Elliott et al., 2003; Hoa Nguyen et al., 2007; Hoa Nguyen & Faff, 2003). A two stage cross sectional regression were employed to test the hypothesis that the foreign exchange exposure will reduces with the use of FDD. In the first stage, foreign exchange exposure is estimated by using Jorion (1990) two factor model. Then the absolute values of exposure coefficient were used as outcome variable in the second stage cross sectional regression where we use FDD as a predictor variable.

First Stage: Estimation of Foreign Exchange Rate Exposure
Followed by earlier studies mentioned in review of literature, this study also used a two factor model to estimate foreign exchange rate exposure of Indian non financial firms in the first stage frame work. Adler & Dumas (1984) modeled the Foreign exchange rate exposure is a sensitivity of the value of the firm, proxies by the firm's stock return, to an unanticipated change in foreign exchange rate.
However several researchers observed some limitations to the Alder Dumas specification. There are other factors other than exchange rate changes are also responsible to the firm's stock return. Researchers said that Adler & Dumas (1984) model does not take in to account the influence of other macroeconomic factors on firm's stock return. In order to overcome such limitation researchers added market portfolio return as a control variable for macroeconomic movement in the Adler &Dumas (1984) specification, which was suggested by Jorion (1990), this improved the model and is popularly known in the world countries and this specification is subsequently used by several researchers all over the world. The specification of two factor model is as follows:

$$R_{it} = \beta_{0i} + \beta_{1i}R_{mt} + \beta_{2i}R_{st} + \varepsilon_{it} \quad \dots\dots\dots\dots\dots\dots\dots\dots \quad (1)$$

Where R_{it} is the changes in stock return of the i^{th}firm in period t, R_{mt} is the change in rate of market return of S&P CNX 200 index to control the macroeconomic factors; R_{xt} is the change in bilateral foreign exchange rate, calculated as the home currency price of the foreign currency for period t (Indian rupee against US dollar) and $\varepsilon_{it}$is the error term.
In Equation1, $\beta_{2i}$is the exposure coefficient, it represents the percentage changes in the stock return of a firm

against a percentage changes in the exchange rate. A firm with cash flow from operations from USA will be adversely affected by an appreciation of Indian rupee against US dollar, the stock return (value of firm) would decrease, thus resulting in a positiveexchange rate exposure and depreciation of Indian rupee would benefit to export firm and shows a negative exposure. On the other hand if a firm is an importer, an appreciation of the Indian rupee will be favorable to that firm (i.e., stock return should increase), resulting a negative exposure and depreciation of Indian rupee against US dollar will be unfavorable to its stock return,hence showing a positive exchange rate exposure.

Second Stage: Cross Sectional Regression.
In the second stage, cross sectional regression which uses the absolute foreign exchange exposure estimated in the first stage regression as a dependent variable and financial instrument, FDD is independent variables along with some control variables. There is a sign effect of dependent variable in the second stage regression. A firm with foreign revenue from the foreign sales (export) is to be probably adversely affected by Indian rupee appreciation against foreign currency USD, thus   expected sign of foreign involvement (FSTS) coefficient is positive. On the other hand a firm with an importing position has a favorable position by an appreciation of Indian rupee so that a negative sign will be expected for the coefficient of foreign involvement. In order to overcome this problem of sign effect the second stage regression takes the absolute value of foreign exchange rate exposure coefficient which is estimated by the first stage regression.Following the earlier study, the present study also used the cross sectional regression as same as they used. There are two models used to test the hypothesis.
In the first model, the absolute value of estimated foreign exchange rate exposure is regressed with FDDT, which is the notional amount of foreign currency denominated debt deflated by total debt and foreign involvement variable. The model specification is as follows:

$$/\beta_{2i}/ = \alpha_0 + \alpha_1 FDDT_i + \alpha_2 FSTS_i + \varepsilon_i \qquad .... \quad (2)$$

In the second model, in line with earlier studies mentioned in literature review, the equation 2 modified by adding some more variables as proxies for hedging incentive to test the same hypothesis that the foreign exchange rate exposure reduces by use of foreign currency denominated debt such as size of the firm, leverageand liquidity.
The modified model which incorporates all the hedging incentives is as follows:

$$/\beta_{2i}/ = \alpha_0 + \alpha_1 FDDT_i + \alpha_2 FSTS_i + \alpha_3 SIZE_i + \alpha_4 LEV_i + \alpha_5 LIQ_i + \varepsilon_i \quad (3)$$

Where $SIZE_i$ is the size of firm measured by total asset of firm I, LEV_i is the leverage ratio, calculated by total debt to total asset for firm i, LIQ_i is the liquidity, calculated by the ratio of the total current asset to total current liability.In order to avoid the multicollinearity and effect of interdependence among the hedging incentive variables in one specification, this study run separate regressions for each hedging variable in addition to equation 3. The different specification of regression is as follows:

$$/\beta_{2i}/ = \alpha_0 + \alpha_1 FDDT_i + \alpha_2 FSTS_i + \alpha_3 SIZE_i + \varepsilon_i \quad .... \quad (3.a)$$
$$/\beta_{2i}/ = \alpha_0 + \alpha_1 FDDT_i + \alpha_2 FSTS_i + \alpha_3 LEV_i + \varepsilon_i .... \quad (3.b)$$
$$/\beta_{2i}/ = \alpha_0 + \alpha_1 FDDT_i + \alpha_2 FSTS_i + \alpha_3 LIQ_i + \varepsilon_i \quad .... \quad (3.c)$$

Weighted least square methodology was used to test the second stage regression where more weight is given to the depended variable foreign exchange rate exposure. The weight is estimated by the reciprocal of squared standard error of foreign exchange rate exposure estimated by equation 1

RESULTS AND DISCUSSION:

First Stage Result of Foreign Exchange Rate Exposure:
The summary statistics of estimated foreign exchange rate exposure using equation 1, of all firms and FDD user firms are presented in table.2.

Table 2: Summary Statistics of Foreign Exchange Rate Exposure

	All firms	FDD users
Mean	-0.27425	-0.11088
Median	-0.1435	-0.063
Minimum	-5.117	-5.117
Maximum	1.92	1.92
Std. Dev.	1.093	1.037
No. of positive exposure	68	41

	All firms	FDD users
No. of Negative exposure	90	45
No. of significant exposure at 1% level	2(both -ve)	2(both -ve)
No. of significant exposure at 5% level	11(8-ve,3+ve)	Four(two each –ve and +ve)
No. of significant exposure at 10% level	5(3 -ve,2 +ve)	Three(two+ve and one -ve
% of significant cases	11.39	10.46
No of observation(firms)	158	86

This table presents the summarystatistics foreign exchange exposure coefficient(β_{2i}) of firms in different samples. β_{2i} is estimated by following two factor model developed by Jorion 1990;R_{it}= β_{0i}+ $\beta_{1i}R_{mt}$ + $\beta_{21}R_{st}$ +ε_{it} ;Where R_{it} is the changes in stock return of the ith' firm's in period t, R_{mt} is the change in rate of market return of S&P CNX 200 index to control the macroeconomic factors; R_{xt} is the change in bilateral foreign exchange rate, calculated as the home currency price of the foreign currency for period t (Indian rupee against US dollar) and $\varepsilon_{it}$is the error term.

Table 2 shows the summary statistics of first stage regression equation 1results of different sample firms. In the second column of the table shows the estimated exposure summary of all 158 non financial firms in our sample. The column presents the descriptive statistics of mean, median, standard deviation, minimum and maximum of exposure coefficient are -0.27425,-0.1435, 1.093, -5.117 and 1.921 respectively. The column furnishes that 90 firms are having negative foreign exchange rate exposure and remaining 68 firms having positive foreign exchange rate exposure. There are 18 firms that show significant exposure at different level of significance. It comes to 11.39% of total sample firms. There are two firms having high significant foreign exchange exposure at one percent level and also they have negative sign. Out of eleven firms, eight firms are showing negative and three firms have positive sign of exposure coefficients at five percent level of significance. Five firms show weak level (10 percent) of significance out of which two firms show positive sign and remaining three are with negative sign.

The third column of table 2 reported the exposure result of 86 FDD user firms. The descriptive statistics of exposure coefficient's mean, median, standard deviation, minimum and maximum are -0.110,-0.063, 1.037, -5.117 and 1.921 respectively. The column also shows 45 firms having negative exposure and remaining 41 firms positive exposure. Out of the 86 firms only nine firms are showing significant exposure at different level of significance. It comes to only 10.46% of FDD user firms. There are two firms highly significant foreign exchange exposure at one percent level with negative sign. Four firms comprising two each shows both sign of exposure at five percent level. Of the remaining three firms, two firms' shows positive sign and a firm negative sign with ten percent level.

The overall results are consistent with earlier studies, especially in USA based studies(Choi & Prasad, 1995; Fraser & Pantzalis, 2004; Jorion, 1990) in terms of percentage of firms having significant exposure. Present study reported that only 11.39% firms have significant exposure at different levels of significance. Jorion(1990) reported five percent, Pitamani, Shome&Singal (2004) reported eight percent, Fraser&Pantzalis (2004) reported 12 percent and Choi & Prasad(1995) evidenced 15 percent in their respective samples studies in USA. However some of the studies outside the USA reported relatively higher number of percentage of firms in their samples in different countries. Solano(2000) in Spain reported 21 percent, Luo, Visaltanachoti&Kesayan(2006) in New Zealand evidenced 19 percent, Kiymaz (2003) in Turkey reported relatively highest percentage of exposure (47percent). Junior(2011) in Brazil reported 25 percent, Clark &Mefteh(2011) in France reported 23 percent, and Kangaraja&Sikarwar (2011) in India reported 16 percent of firms have significant foreign exchange rate exposure.

Second Stage Cross Sectional Regression Results:
In the second stage of regression, the absolute value of foreign exchange rate exposure coefficient estimated by equation 1 is used as dependent variable in the second stage cross sectional regression. Weighted least square regression was used for testing the relationship between estimated foreign exchange exposure (equation1) with foreign currency denominated debt and other control variables.

Table 3: Descriptive Statistics of Foreign Currency Denominated Debt User Firms

Statistics	ABSEXP	FDDT	FSTS	SIZE	LEV	LIQ
Mean	0.730	0.359	0.210	11.343	0.262	2.064912
Median	0.570	0.334	0.092	11.175	0.275	1.788597
Minimum	0.004	0.000	3.49E-05	9.547	0.004	0.353357

Statistics	ABSEXP	FDDT	FSTS	SIZE	LEV	LIQ
Maximum	5.118	1.000	0.921	14.626	0.645	6.356212
Std. Dev.	0.746	0.240	0.239	1.217	0.148	1.204982
Observations	86	86	86	86	86	86

This table provides descriptive statistics of variables used in the second stage regression for testing the hypothesis of the use of foreign currency denominated Debt is effective to hedge foreign exchange exposure. ABSEXP, is absolute foreign exchange exposure estimated by equation(1), FDDT is the foreign currency denominated debt divided by total debt , FSTS is the ratio of foreign sales to total sales , size is the natural logarithm of total asset of the firm, LEV is stands for leverage calculated as total debt to total asset of each firm and LIQ stands for liquidity of firm measured by current ratio

Table 3 shows the results of exploratory data analysis used in second stage regression of FDD users. From the table we can see that the use of foreign currency denominated debt is constituted around 36 percent of total debt. It indicates that the sample firms are used considerable portion of foreign currency denominated debt. Twenty one percent of total sales is constituted by foreign sales of the FDD users. The leverage ratio shows 26 percent, it indicates that total debt of FDD users are one fourth of total assets. The liquidity ratio shows 2.06, which is higher than the ideal current ratio of 2:1. It says that the liquidity positions of FDD users are high.

Table.4 presents result of second stage weighted least square regression. Second column of table shows the results of all 86 FDD users firms without considering the sign of dependent variable. It evidenced that the variable FDDT shows the negative and significant coefficient (-0.778, p<0.05). It indicates that the use of financial hedging strategy of foreign currency denominated debt is negatively associated with foreign exchange rate exposure. That means the use of FDD is reducing foreign exchange rate exposure.This result consistent with earlier researchers (Allayannis & Ofek, 2001; Al-Shboul & Alison, 2009) The variable foreign sales to total sales (FSTS) show the positive coefficient (0.227) as is expected. It indicates that the foreign involvement is the main source of foreign exchange rate exposure, and we expected that the relationship between foreign involvement and foreign exchange rate exposure are positive association. However the FSTS is shows an insignificant (p>0.05) relationship with foreign exchange exposure. The insignificant relation of FSTS and exposure is consistent with previous studies (Bae & Kwon, 2011; Junior, 2011; Monshi et al., n.d.; Hoa Nguyen & Faff, 2003)

Table 4: Impact Of Foreign Currency Denominated Debt On Foreign Exchange Exposure

Dependent variables	Abs exposure	Positive exposure	Negative exposure
Intercept	1.017***	0.987***	-1.200***
FDDT	-0.778**	-0.997***	0.690
FSTS	0.227	-0.412	-0.121
Adj.R	0.05	0.12	0.18
F value	3.39**	3.94**	0.856
Observation	86	41	45
DW	2.23	1.78	2.15

The first column of table providesestimated results of cross sectional regression $/\beta_{2i/} = \alpha_0 + \alpha_1 FDDT_i + \alpha_2 FSTS_i + \varepsilon_i (2)$ where, $/\beta_{2i/}$ is absolute foreign exchange exposure estimated by equation(1), FDDT(foreign currency denominated debt divided by total debt) , FSTS is the ratio of foreign sales to total sales. The second column gives the results of cross sectional regression for only for positive foreign exchange exposure firms and third column provides the cross sectional results of only negative exposure firms.
Note:*** ,** and * indicates level of significance at 1% ,5% and 10% respectively

Third column depicts the results of second stage regression only for firms having positive foreign exchange rate exposure. There are 41 firms having positive exposure, The variable FDDT shows negative and highly significant association (-0.997, p<0.01) with dependent variable foreign exchange exposure. The negative sign of the coefficient evidences that the use of FDD instrument is effective to hedge the foreign currency exposure. The sign of foreign involvement variable (FSTS) shows the negative (-0.412), this is against our expectation. However FSTS shows insignificant relation with dependent variable foreign exchange rate exposure.The forth column presents the results of second stage regression only for firms having negative foreign exchange rate exposure. There are 45 firms having negative exposure. The variable FDDT shows positive (0.690) association

with dependent variable foreign exchange exposure. But this result shows insignificant. The sign of foreign involvement variable FSTS shows the negative (-0.121).

Table 5: Impact of Foreign Currency Denominated Debt on Foreign Exchange Exposure with Control Variables

Variables	Model 3	Model 3a	Model 3b	Model 3c
Intercept	0.654	0.030	1.113***	1.30***
FDDT	-0.602*	-0.695**	-0.758**	-0.652**
FSTS	0.487	0.359	0.209	0.407
Size	0.053	0.082		
Lev	0.003		-0.367	
Liq	-0.174***			-0.179***
Adj.R	0.13	0.05	0.047	0.15
F value	3.66***	2.69**	2.40*	6.02***
Observation	88	86	86	86
DW	2.25	2.21	2.25	2.25

This table provides estimated results of various cross sectional regression(equation 3 to 3c)to test the hypothesis that the use of foreign currency denominated debt is effectively reduces the foreign exchange exposure.the equation 5.4.a as follows $/\beta_{2i}/ = \alpha_0 + \alpha_1 FDDT_i + \alpha_2 FSTS_i + \alpha_3 SIZE_i + \alpha_4 LEV_i + \alpha_5 LIQ_i + \varepsilon_i (3)$ where $/\beta_{2i}/$ is absolute foreign exchange exposure estimated by equation(1), FDDT(foreign currency denominated debt divided by total debt) , FSTS is the ratio of foreign sales to total sales , SIZE is thenatural logarithm of total asset of the firm, LEV is stands for Leverage calculated as total debt to total asset of firm and LIQ stands Liquidity of firm measured by current ratio of each firm
*** ,** and * indicates level of significance at 1% ,5% and 10% respectively.

Table5provides the results of various models of second stage regression. Here researcher added few control variables to the basic model (eqation 2) such as Size, Leverage (LEV) and Liquidity (LIQ). Researcher first run a regression by adding all hedging incentive variable together then in order to avoid the multi collenerity problem we discussed in correlation matrices, researcher add incentive variable one by one in the basic model (equation 2) so as to examine the effectiveness of foreign currency denominated debt use on foreign exchange rate exposure.

From the table we can see that all the models the coefficient of foreign currency denominated debt shows the negative and statistically significant coefficient. This shows the use of FDD significantly reducing or hedging foreign exchange rate exposure. All the models we accept our alternative hypothesis of use of foreign currency denominated debt effetely hedging foreign exchange exposure. It evidences by adding all control variable into the basic model still the foreign currency denominated debt shows the negative and significant relation with foreign exchange rate exposure.

The variable foreign involvement (FSTS) shows remain positive throughout the all models as we expected that the foreign involvement is the main contributing factor of foreign exchange rate exposure. However all the cases it indicate only insignificant relation with foreign exchange rate exposure and it is consistent with some earlier studies (Clark & Mefteh, 2011b; Junior, 2011; Monshi et al., 2011; Hoa Nguyen & Faff, 2003). However some studies were reported negative relation between foreign involvement and foreign exchange exposure (Al-Shboul & Alison, 2009; Hoa Nguyen et al., 2007; Hoa Nguyen & Faff, 2006)

The hedging incentive variable size is showing positive sign. The earlier researchers (Al-Shboul& Alison, 2009; Junior, 2011; Monshi et al., 2011; Hoa Nguyen et al., 2007) were justified this because size of firm is one of main determinant of hedging decision. Usually big firms are more foreign involvement and more foreign exchange rate exposure.

The hedging incentive variable leverage of firm which is proxied by total debt to total asset shows a positive sign when all incentive variables added to the model. But in model 3b it shows the negative sign. We expected a negative sign for this variable because firm having high leverage ratio are more chance to financial distress and therefore they want to hedge risk from exchange rate changes. This result is consistent with previous studies (Clark & Mefteh, 2011b; Hoa Nguyen et al., 2007), they reported leverage have a negative association with exposure.

The last control variable in our model is liquidity is measured by current ratio, and it shows a negative and statistically significant relation with foreign exchange exposure as expected. Generally higher liquidity position, firms are less chance to financial distress since it has capacity to meet its short term financial requirement. Hence such firms are not motivated to use hedging because liquidity itself acts as hedging substitute. The

negative sign of liquidity with exposure is consistant with previous studies (Al-Shboul & Alison, 2009; Hoa Nguyen et al., 2007; Hoa Nguyen & Faff, 2006)

We can observe from the tables that all hedging incentive variables used in this study shows the expected sign with foreign exchange rate exposure. However most of the cases relationship between exposure and control variable are statistically insignificant. It indicates that these entire control variables are incentive for use of hedging but they are not statistically impacted on foreign exchange rate exposure. Finally in presence of all control variables our main variable remain shows a negative relation it evidenced that the use of foreign currency denominated debt is an effective hedging tool for managing foreign exchange exposure.

CONCLUSION:

The study has found a statistically significant negative relation between foreign exchange exposure and foreign currency denominated debts evidencing that the use of financial instrument is effective hedging tools for reducing currency exposure.

The implication of this study is that it gives an insight in to the various players of foreign exchange market like financial managers and regulators. Financial managers of corporate firms get a success story of effective management of foreign exchange exposure. Regulators can observe from this study that the derivative instruments and foreign debt are effective products and make policies in positive line to use of such products in wider way by making a transparent foreign exchange market.

The main delimitation of this study and scope for further study is that this study only concentrates short term exposure management of financial hedging instruments foreign currency denominated debts. But there are number of other short term and long term exposure management instruments and other operational hedging strategies for managing foreign exchange risk of corporate firms. A separate study could be extended on this area.

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