Family Ownership and Exchange Rate Exposure: New Evidence from India

by

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Abstract: This paper provides new evidence on the relationship between family ownership and exchange rate exposure. For a sample of 651 Indian firms over the period from 2001 to 2013, we find a significant non-monotonic cubic relationship. Exchange rate exposure increases with family ownership at low and high levels (as a result of the entrenchment or expropriation effect) and decreases with family ownership at intermediate levels (as a consequence of the convergence-of-interest or monitoring effect). The study has important theoretical and practical implications.

Key words: Exchange rate exposure, family ownership, India
INTRODUCTION

The impact of changes in exchange rate on the value of the firm has been theoretically postulated (Hekman, 1983, 1985; Shapiro, 1975), however, the empirical evidence on this issue is still weak (Amihud, 1994; Chue & Cook, 2008; Jorion, 1990; Lin, 2011; Muller & Verschoor, 2007). The inability of empirical studies to detect theoretical relationship is termed as ‘exposure puzzle’ (Bartram & Bodnar, 2007). Major explanations to the so called ‘exposure puzzle’ are differences in research design among studies (Bartov & Bodnar, 1994; Bodnar & Wong, 2003; Dominguez & Tesar, 2006; Priestley & Ødegaard, 2007), usage of hedging techniques by firms (Allayannis & Ofek, 2001; Bartram & Bodnar, 2007) and time varying nature of exposure (Allayannis, Ihrig, & Weston, 2001; Jorion, 1990; Koutmos & Knif, 2002).

Recent literature has brought out the role of corporate governance in providing incentives to managers to conduct value-enhancing hedging and risk management activities (Allayannis, Ihrig, & Weston, 2012; Fauver & Naranjo, 2010; Lel, 2012; Tufano, 1998). This literature argues that hedging is value added or optimal if the firm has strong corporate governance environment. Strong corporate governance of the firm reduces agency conflicts between managers and shareholders, which affect the hedging motives of managers. The motives of hedging by managers are classified into two groups of theories. Firstly, according to optimal hedging theories, hedging reduces risk and contributes to the value of the firm if it mitigates the costs associated with market imperfections such as underinvestment (Bessembinder, 1991), external financing (Froot, Scharfstein, & Stein, 1993), financial distress and taxes (Smith & Stulz, 1985). Secondly, in the presence of the agency conflicts between managers and shareholders, managers may have some other managerial motives, which may lead to sub-optimal, and non-value maximizing hedging. These motives are selective hedging (e.g., Bodnar et al., 1998; Géczy, Minton, & Schrand, 1997; 2007) to gain from the market or speculation, reduction of information asymmetry among the outside investors, Board of Directors (BODs) and managers about their performance (DeMarzo and Duffie, 1995; Dadalt et al., 2002) and manager’s lack of portfolio diversification (Stulz, 1984). Non value-enhancing hedging by managers in the presence of agency conflicts may expose firm to higher exchange rate risk.
Extending this area of enquiry, Hutson and Stevenson (2010) explore the role of country level governance mechanisms i.e. shareholder and creditor rights, in reducing exchange rate exposure. They argue that strong corporate governance environment incentivizes managers to work in the best interests of shareholders and to maximize shareholder value by hedging. Value enhancing hedging by managers causes reduction in exchange rate exposure of firm. Since corporate governance of a firm includes a wide range of mechanisms at both firm and country level that govern the actions of managers, the impact of firm level governance on exchange rate exposure can also be expected. The idea that ownership structure is one of the main firm level corporate governance mechanisms influencing the scope of a firm’s agency costs is generally accepted (Dalton, Daily, Certo, & Roengpitya, 2003; Jensen & Meckling, 1976).

Specifically emerging markets like India where country level governance mechanisms are somewhat weaker, ownership concentration becomes a substitute for legal investor protection (La Porta, Lopez-De-Silanes, Shleifer, & Vishny, 1998). In this way ownership, structure of firms should be likely to affect the level of their exposure to exchange rate risk. The corporate ownership structure in many Asian countries is concentrated and family ownership is a predominant form of ownership (La Porta, Lopez-de-Silanes, & Shleifer, 1999; Claessens et al., 2000). These founding family owners have significant influence over managerial decisions because of their large undiversified equity position, control, historical long presence, close link of family’s wealth with firm welfare, long-term orientation and inside knowledge of the firm’s business activities (Anderson & Reeb, 2003; Demsetz & Lehn, 1985; Fama & Jensen, 1983; Schulze, Lubatkin, Dino, & Buchholtz, 2001; Shleifer & Vishny, 1997). In this connection, we argue that family ownership can affect exchange rate exposure of a firm by influencing the managerial hedging and risk management decisions. At low and high levels of family ownership, the managers are indulged in non-value maximizing hedging due to entrenchment or expropriation effect, which leads to higher exchange rate exposure. On the other hand, at intermediate levels of family ownership, managers perform optimal hedging as a result of the convergence-of-interest or monitoring effect, which reduces exposure. Thus, we hypothesize a non-linear cubic relationship between family ownership and exposure.

There has been an enormous amount of literature available on the determinants of exchange rate exposure to resolve the ‘exposure puzzle’, however; the effect of family ownership on exchange rate exposure has not been investigated before in the existing literature.
This study examines the impact of family ownership on exchange rate exposure using a sample of 651 Indian firms. To the best of our knowledge, this study is the first to provide evidence that the relationship between family ownership and exchange rate exposure is nonlinear in nature in the cubic form. The study has important implications for managers, shareholders and other investors who are associated with the assessment of the firm’s exposure to exchange rate risk.

The remainder of this paper is organized as follows. Theory and hypothesis development is presented in the subsequent section, and this is followed by a description of the methodology used in this study. The data and sample selection are then described, followed by the empirical results. Finally, robustness tests are explained and a conclusion outlined.

THEORY AND HYPOTHESIS DEVELOPMENT

The relationship between family ownership and exchange rate exposure can be hypothesized by drawing arguments from two broad theoretical literatures. First, which describes how ownership structure of a firm affects agency conflicts between managers and shareholders. These hypotheses are called convergence of interest, monitoring, entrenchment and expropriation hypotheses. The agency conflicts between managers and shareholders associated at different levels of family ownership can be supposed based on this literature. Second, optimal hedging theories, which explain the influence of agency problems on hedging motives of managers that could have impact on exposure, level of the firm.

Based on these theories, we can develop how family ownership indicating the agency problems between managers and shareholders could affect exposure by influencing hedging motives of managers.

Ownership and agency conflicts

Agency theory claims that different type of ownership structures are associated with various agency problems, which might cause managers not to work in the best interests of shareholders and to conduct non-value maximizing activities.

According to Jensen and Meckling's (1976) convergence-of-interest hypothesis, as insider (promoter) equity ownership increases, conflicts between managers and shareholders are likely to be reduced causing the conflicts of interests to converge. This hypothesis suggests that as
insider ownership rises, managers make decisions consistent with the maximizing shareholder’s wealth and firm value increases. On the other hand, Fama & Jensen (1983) argue that when a manager owns a substantial fraction of the firm’s shares, it gives him enough voting power or influence. This may make him pursue his personal agenda or non-value maximizing activities. This is entrenchment hypothesis, which suggests that excessive insider ownership reduces the firm value. Shleifer and Vishney (1997) contend that concentrated owners have greater incentives to actively and effectively monitor deviant managers because of their substantial investment in the firm, enough voting rights to maintain control and informational advantage. This is monitoring hypothesis, which explains positive association between ownership concentration and firm value. Shleifer and Vishney (1997) also argue that agency problems come from the conflict between majority owners and minority shareholders. In this case, majority owners can expropriate wealth from the minority shareholders and can reduce firm value (expropriation hypothesis).

**Corporate Governance, Hedging and Exposure**

The theoretical literature explains the role of agency problems in influencing hedging motives of managers. The real motives of hedging can be classified under two main groups. The first group of theories suggest that hedging creates value and reduces risk optimally if it mitigates the costs associated with market imperfections such as underinvestment, external financing, financial distress and taxes. The corporate hedging could mitigate the underinvestment costs by reducing the volatility of firm value (Myers, 1977). Hedging can also reduce the cost of external financing by lowering the cash flow volatility so that the firm can have access to internal funds for investment (Froot et al., 1993). Hedging lowers the probability of financial distress by reducing the volatility of firm value and thus reduces the cost of financial distress (Smith and Stulz, 1985). Corporate hedging stabilizes taxable income, as savings from higher income states exceed additional taxes from lower income states, thus lowering the average corporate tax burden (Smith and Stulz, 1985). These shareholder value theories assume that there are no agency costs associated with equity. The second group of theories indicate that in the presence of agency costs, there are managerial reasons of hedging related to contractual factors, which induce managers to involve in non-value maximizing hedging and sub-optimal risk reduction. These reasons are selective hedging/speculation, manager’s lack of portfolio diversification and the reduction of
informational asymmetry among the outside investors, BODs and managers about their performance. Selective hedging strategies, a term given by Stulz (1996), are based on the forecasts of future exchange rates in which the managers attempt to time the market and hedge only a small part of the exposure. This strategy involves the speculation element, increases the cash flow volatility, and therefore does not add value to the firm (Brown, Crabb, & Haushalter, 2006). Managerial risk aversion motives may lead managers to hedge to protect themselves and not necessarily to benefit shareholders (Smith and Stulz, 1985). Also hedging can reduce the “noise” in earnings contributed by macroeconomic factors and lessen the asymmetric information in the market regarding managerial ability and firm value (DeMarzo and Duffie, 1995; Breeden and Viswanathan, 2006). This indicates that the managers with inferior abilities may have incentives not to hedge properly. Therefore, in the presence of agency conflicts, the managerial reasons of hedging activities subsume the other incentives and hedging does not create value by reducing the risk optimally. Empirical studies also suggest that in the presence of agency conflicts firm managers may selectively use derivatives for speculation and self-interests (e.g., Geczy et al., 2007; Campbell and Kracaw, 1999; Bodnar et al., 1998; Tufano, 1998; Ljungqvist, 1994). Recent empirical studies find that managers may involve in suboptimal and non-value enhancing hedging activities in the presence of greater agency problems (Rossi, 2013; Fauver and Niranjo, 2010; Allayannis et al. 2012; Lel, 2012).

**Family Ownership and Exposure**

The impact of family ownership on exchange rate exposure can be theorized based on the above-mentioned hypotheses and can be viewed from two perspectives depending upon whether families take part in the management. Existing studies report that many Indian firms have a promoter family member participating in the management. For example, Singla, Veliyath, & George, (2014) reported that 62 percent of their sample firms were family managed and Selarka, (2005) found that 58.59 percent of her sample firms were managed by the promoter.

The hypothesis is developed considering both the cases. When family does not take part in management, a low level of family ownership makes monitoring of managers difficult, which may induce managers to pursue non-value maximizing activities (entrenchment) or suboptimal hedging. At higher level of family ownership, a higher monitoring of managerial activities restricts managers to incorporate their personal subjective views and benefits into the firm’s risk management policies. This, in turn, induces managers to conduct value-enhancing hedging
activities (monitoring effect) and to manage risk optimally. Again, when family ownership becomes substantial and family majority owners expropriate minority owners seeking their own benefits (expropriation), they can induce managers to pursue non value-maximizing hedging. In summary, at low levels of family ownership hedging is sub-optimal due to entrenchment followed by value maximizing hedging at intermediate level of family ownership due to monitoring and then again by improper hedging at relatively high level of family ownership.

When families actively take part in management, monitoring is not needed. In this case, low levels of family ownership may induce managers to pursue their own personal interests and non-value-maximizing activities (entrenchment effect) as their shareholdings in the companies are not substantial. When family ownership increases and reaches at intermediate level, the natural alignment of owner-managers’ interests about growth opportunities and risk encourage owner-managers to conduct value-enhancing activities (convergence of interest). At very high level of family ownership, again the owner manager can pursue non-value maximizing activities to benefit his own wealth (entrenchment). In summary, at low levels of family ownership hedging is improper due to entrenchment followed by value maximizing hedging at intermediate level of family ownership due to convergence-of-interest and then again by sub-optimal hedging at relatively high level of family ownership.

Since sub-optimal and non-value maximizing hedging increases exposure (Allayannis & Ofek, 1998), we can hypothesize that the relationship between exchange rate exposure and family ownership is non-linear and in the cubic form. Regardless of whether families take part in the management or not, the following relationship between exchange rate exposure and family ownership can be hypothesized;

\[ H_1: \text{Exchange rate exposure increases with family ownership at low and high levels (as a result of the entrenchment or expropriation effect) and decreases with family ownership at intermediate levels (as a consequence of the convergence-of-interest or monitoring effect).} \]

The proposed relationship has not received attention in the existing literature and is tested in the current study using a sample of 651 Indian firms.
RESEARCH METHODOLOGY

Measuring Foreign Exchange Exposure

The exchange rate exposure of firms is examined before exploring the relationship between exposure and family ownership. The exchange rate exposure is estimated by the approach suggested by Jorion (1990)\(^1\) as follows:

\[
R_{it} = \beta_{0i} + \beta_{mi} R_{mt} + \beta_{si} R_{st} + \epsilon_{it}
\]  

where \(R_{it}\) is the monthly stock return of firm \(i\) in period \(t\); \(R_{mt}\) is the monthly return on the market portfolio in period \(t\); \(R_{st}\) is the monthly percentage change in the trade-weighted exchange rate index, measured as units of foreign currency per one Indian Rupee in period. The increase in the value of \(R_{st}\) indicates an appreciation of Indian Rupee against a basket of foreign currencies. The coefficients \(\beta_{mi}\) and \(\beta_{si}\) represent a measure of sensitivity of stock return of firm, \(i\), to market risk and exchange risk; \(\epsilon_{it}\) is the disturbance term. The value obtained for \(\beta_{si}\) for different firms can be interpreted as a level of exposure to exchange rates indicating the extent to which the stock return responds to a 1% change in the exchange rate\(^2\). A positive coefficient means that firm’s stock return increases when the Indian rupee is appreciated against the basket of other currencies. Equation (1) is estimated by ordinary least square (OLS) correcting for standard errors by Newey & West (1987) method.

Cross-Sectional Regression Model

The study uses cross-sectional regression model to examine the impact of family ownership on exchange rate exposure by controlling for individual firm characteristics known to affect firm’s exposure to exchange rate risk. The following empirical model is used correcting standard errors for heteroscedasticity by White (1980) method;

\[
|\beta_{si}| = \gamma + \gamma_1 ER_i + \gamma_2 SIZE_i + \gamma_3 HEDGE_i + \gamma_4 FAMILY_i + \gamma_5 FAMILY_i^2 + \gamma_6 FAMILY_i^3 + \\
\sum_{k=1}^{18} \gamma_k^{INDDUM} + \mu_i
\]

\(^1\) The similar methodology has been adopted by numerous other studies (Choi and Prasad, 1995; He and Ng, 1998; Dominguez and Tesar, 2006; Hutson and Stevenson, 2010; Ye et al., 2014)

\(^2\) In equation (1), \(\beta_{si}\) cannot be interpreted as ‘total exposure’ but rather the exposure of stock over and above that of the market portfolio i.e. residual exposure. In order to eliminate the effect of exchange rates from market portfolio, orthogonalization procedure was employed as suggested in the literature (Priestley and Odegaard, 2007; Kiyam, 2003).
where $|\beta_{si}|$ is the absolute value$^3$ of foreign exchange rate exposure coefficient of firm $i$ estimated from equation (1). All independent variables are operationalized by taking the average of year-end figures for sample period of 12 years i.e. March 2001-April 2013.

$FAMILY_i$ denotes promoter ownership (shareholding by promoter and promoter group) in the firm. Founding family and promoter control is predominant in Indian firms (Khanna & Palepu, 2000). In the Indian context, promoter share reflects the direct insider or the family holding in the firm (Pant & Pattanayak, 2007). Following the existing literature on Indian firms (Jackling & Johl, 2009), promoter shareholding is considered as a family ownership in the firm in the context of this study.

Promoter may be an individual, group of individuals, a family or a company who are in overall control of the company, are instrumental in the formulation of a plan and named in the prospectus as promoters. A promoter group includes a promoter and an immediate relative of the promoter. $FAMILY_i^2$ and $FAMILY_i^3$ denote the square and cube of family ownership in the firm. The sign of $\gamma_4$ and $\gamma_6$ is expected to be positive and that of $\gamma_5$ is expected to be negative.

**Control Variables**

The control variables are export sales scaled by total sales, hedging and size of the firm. $ER_i$ denotes absolute value of net exports sales scaled by total sales for firm $i$, $SIZE_i$ is the logarithm of a firm’s total assets and $HEDGE_i$ is the dummy variable having value 1 if the firm $i$ uses currency derivatives for hedging purposes, zero otherwise and $INDDUM_i^k$ are 18 industries dummies with Chemical, Plastic and Petroleum industry as a reference category for dummy variables. $\mu_i$, the error terms are assumed to be normally distributed. Data for currency derivative usage is hand collected from the annual reports of firms. A firm with greater foreign involvement is expected to be exposed to greater currency risk, before any hedging activities being taken into account. Several studies have found a strong positive relation between firm’s foreign exchange exposure and its foreign involvement (Jorion, 1990; Choi and Prasad, 1995; He and Ng, 1998; Dominguez and Tesar, 2006). This study also follows prior studies and uses export sales, scaled by total assets to represent the firm’s foreign involvement. A firm may

$^3$ Taking absolute value of exposure beta is consistent with prior literature (Aggarwal and Harper, 2010; Aysun and Guldi, 2011; Choi and Prasad, 1995; Faff and Marshall, 2005; Doukas et al. 2001, Bartram, 2004
reduce its exchange rate exposure by engaging in financial hedging. To measure financial hedging, a foreign currency derivative usage dummy is used that assigns a value of one if the firm uses foreign currency derivatives or zero otherwise. These data were hand-collected from the firms’ annual reports. Previous studies have detected conventional negative relationship between currency derivative usage and foreign exchange exposure (Allayannis and Ofek, 2001). To control for possible firm’s size effects on exchange rate exposure, the natural logarithm of firm’s total assets is used. It is well established by literature that small firms tend to be more exposed to exchange rate risk than large (Chow et al., 1997; Bodnar and Wong, 2003; Dominguez and Tesar, 2006). Larger firms are more likely to hedge exchange exposure as a result of their economies of scale and, therefore face lower exposure. Several studies have found that exchange rate movements affect industries differentially. Industries differ in terms of pass through and markups (Allayannis & Ihrig, 2001) or competitive structure (Marston, 2001; Griffin and Stulz, 2001) and hence may face different levels of exposure. The industry categories for this study follow the industrial categorization codes of (NIC) National Industrial Classification. In all specifications of cross-sectional regressions, industry effect is controlled using dummies.

DATA AND SAMPLE SELECTION

The sample of firms for the study is primarily sourced from Centre for monitoring the Indian economy (CMIE) Prowess database. Similar to previous studies, we exclude financial firms from sample firms because derivative usage for financial firms is often business related. The non-financial firms, which are listed on Bombay Stock Exchange (BSE), are 4308. The non-financial listed firms that report international transactions (exports or imports) in each of the years of sample period are 1255, out of which 651 firms have no missing stock return data. Therefore, the final sample consists of 651 firms. Table I displays industry classification and international trade pattern for sample firms. In India, listed firms have to make mandatory disclosure about their ownership structure under Clause 35 of the equity listing agreement. These ownership disclosure requirements have undergone important changes effective from March 2001. In the light of this, the sample period in this study is selected from April 2001 to March 2013.

(Insert Table I about here)
For estimating firms’ exposure coefficients at first stage, monthly data was obtained. The market portfolio monthly returns are calculated from BSE Sensitive Index (Sensex) of 30 firms. The index value is available on the website of the Bombay stock exchange\textsuperscript{4}. 36 countries nominal effective exchange rate index (36 NEER; Base: 1985=100) published in Reserve Bank of India (RBI) monthly bulletin is used for the purpose of calculating monthly exchange rate changes\textsuperscript{5}. The monthly stock returns\textsuperscript{6} of firms are obtained from CMIE prowess database.

The data for currency derivative usage is obtained from the notes to financial statements within each firm’s annual report. The annual reports are available online from the ACE Knowledge Portal database by Accord Fintech pvt. Ltd. and Dion Insight database by Dion global solutions ltd. Additional information is obtained directly from the annual reports on the company’s website. For each year in the sample, the notes from annual reports are used to categorize users of currency derivatives (forwards, futures, options, or swaps). A Firm is identified as a currency derivative user during fiscal year $t$ if the firm discloses year-end outstanding number and notional amount of currency derivative contracts in the footnotes or loss/gain on derivatives in the profit and loss account. Data for family ownership and control variables is collected from Prowess database.

### Data on disclosure of family/promoter ownership in the Indian context

In India, all the listed firms are required to give mandatory disclosure of their shareholding pattern for each quarter in the format outlined in Clause 35 of the equity listing agreement. The shareholding pattern is indicated under three categories, viz., “shares held by promoter and promoter group”, “shares held by public” and “shares held by custodians and against which Depository Receipts have been issued.”

The ownership disclosure requirements under Clause 35 have undergone several important changes from March 2001, one from June 2006 and another from February 2009. The clause requires firms to report shareholding of promoter and promoter group following the definition under Explanations I, II and III to sub-clause (m) of clause 6.8.3.2 of the Securities

\textsuperscript{4} [www.bseindia.com](http://www.bseindia.com)

\textsuperscript{5} Examining exposure to the trade weighted exchange rate index is a standard practice followed by literature (Jorion, 1991; Choi and Prasad, 1995; Bodnar and Gentry, 1993; Dominguez and Tesar, 2001).

\textsuperscript{6} The stock returns of all firms, exchange rate changes and market portfolio returns are checked by Augmented Dickey Fuller (ADF) unit root test and found to be stationary.
and Exchange Board of India (SEBI) Disclosure and Investor Protection Guidelines, 2000. Promoter may be an individual, group of individuals, a family or a company who are in overall control of the company, are instrumental in the formulation of a plan and named in the prospectus as promoters. A promoter group includes a promoter and an immediate relative of the promoter. Promoter and promoter group is further classified under Indian and Foreign promoters. The data from June 2006 on promoter ownership is directly obtained for this study from Prowess database. However, from March 2001 to June 2006, individuals, companies or other legal entities who are acting together with the promoters for a common objective were separately reported under Persons acting in concert (PACs), which is now included under the purview of promoter groups. From 2001 to 2006, the promoter ownership is obtained from the sum of the shareholding of promoters and the persons acting in concert. Following the existing literature on Indian firms (Jackling & Johl, 2009; Pant and Pattanayak, 2007), promoter shareholding is considered as a family ownership in the firm in the context of this study.

Table II presents the summary statistics for family ownership and control variables. The mean (median) value of FAMILY is 0.53 (0.52) which indicates that the promoters and their families are the majority owners in Indian firms consistent with Claessens et al. (2002) and Porta, Lopez-de-silanes, Shleifer, & Vishny (2002).

(Insert Table II about here)

EMPIRICAL RESULTS

Exchange Rate Exposure Estimates

Table III reports the summary of the exposure estimates from regression equation (1). We can see that significant exposure to exchange rate risk is exhibited by approximately 66.6% (434/651) of the sample firms. The average value of exchange rate exposure coefficients is 1.317 indicating that a 1 percent appreciation of Indian rupee causes almost 1.32 percent gain in the firms’ stock returns. These results are similar to those of previous studies on emerging markets which report more than half of their sample firms with significant exposure (Bacha, Mohamad, Raihan, & Mohd, 2013; Kiymaz, 2003; Parsley & Popper, 2006; Tsai, Chiang, Tsai, & Liou, 2014; Ye, Hutson, & Muckley, 2014). The findings indicating that, on average, firms
gain from the appreciation of domestic currency is also not surprising and consistent with the prior literature on emerging markets (Chue & Cook, 2008; Dominguez & Tesar, 2006; Muller & Verschoor, 2007; Tsai et al., 2014; Ye et al., 2014). Table IV shows that the exchange rate exposure coefficient estimates are robust to alternative measures of exchange rate index (Real Effective Exchange Rate i.e. 36 REER) rate and market portfolio index (BSE S&P 500 index).

(Insert Table III about here)

(Insert Table IV about here)

**Results of cross-sectional model analysis**

This study follows prior studies to include both significant and insignificant exposure coefficients in the cross-sectional regression analysis (Allayannis et al., 2001; Allayannis & Ofek, 2001; Chang, Hsin, & Shiah-Hou, 2013; Hutson & Stevenson, 2010). Table V presents the results of the hypothesis that the relationship between the exchange rate exposure of firms and family ownership is cubic in form. The coefficients on the variables $FAMILY_i$, $FAMILY_i^2$ and $FAMILY_i^3$ are all significant and are of the expected sign; that is, the sign of $\gamma_4$ and $\gamma_6$ is positive and that of $\gamma_5$ is negative. The results provide support for the hypothesized cubic relationship between the exchange rate exposure and family ownership. Therefore, exchange rate exposure first increases, then declines and finally rises as ownership by family rises. The control variables have also shown the expected relationship with exposure.

(Insert Table V about here)

**Estimation of Turning Points**

The turning points are calculated for the following cubic function obtained;

$$|\beta_{si}| = 5.494 \text{FAMILY}_i - 10.909 \text{FAMILY}_i^2 + 6.273 \text{FAMILY}_i^3 \quad \ldots(3)$$

The turning points are found by differentiating $|\beta_{si}|$ with respect to $FAMILY_i$, putting it to zero and solving. The two turning points are 36.97 percent and 78.90 percent, respectively. The results suggest, therefore, that the exchange rate exposure of firm is positively related to family ownership.
ownership in the 0% to 36.97% range, negatively related in the 36.97% to 78.90% range and positively related when family ownership exceeds 78.90% (Figure 1).

At a lower level of ownership (below 36.97%), the relationship between exposure and family ownership is positive. This is consistent with the hypothesis that, in those firms with low family ownership (in both cases when families take part in management or not), the managers are indulged in non-value maximizing hedging (due to either low monitoring or entrenchment) and thus firms face higher exposure. On the other hand, when family ownership is between 36.97 percent and 78.90 percent (the wide range of intermediate levels of ownership), the relationship between exposure and family ownership becomes negative and more significant. This result confirms that for most of the intermediate range of family ownership, managers are incentivized to perform value-maximizing hedging (due to convergence of interest). This result supports the views of Jensen and Meckling (1976) about the convergence of interest between managers and shareholders when managers have substantial holding. When family ownership further increases and reaches too high a level (beyond 78.90%), the managers exploit their power to the detriment of the minority shareholders and indulged in non-value enhancing hedging. The relationship between family ownership and exposure becomes positive again.

**ROBUSTNESS TESTS**

**Analysis with Financial Statement Variables as Hedging Proxies**

The existing theoretical literature of optimum hedging suggests that corporate hedging reduces the costs associated with market imperfections such as underinvestment (Bessembinder, 1991), external financing (Froot et. al., 1993), financial distress and taxes (Smith and Stulz, 1985). Empirical studies have used several financial statement variables to proxy for hedging activities of the firm. Following He and Ng (1998), three financial variables are used as hedging proxies to test the robustness of the results: book to market ratio (BM), dividend payout ratio (DIV_PAY) and debt to equity ratio (DE). Hedging lowers the probability of financial distress by reducing the volatility of firm value and thus reduces the cost of financial distress (Smith and Stulz, 1985). Therefore, highly levered firms should have involved more in hedging and should be less exposed to the exchange rate risk. Debt to equity ratio is employed as a measure of leverage. The firms with lower liquidity are also having high probability of financial distress and default and thus expected to hedge more and face less exposure. Dividend payout ratio is used to measure liquidity and expected to have a positive relationship with exposure. Firms with high growth opportunities face underinvestment problem and therefore have more
incentives to hedge (Froot et al., 1993). Book-to-market value is used to measure firms’ growth opportunities and expected to have a positive relationship with exposure. Table VI displays the results from the re-estimation of the equation (2) taking financial statement variables as hedging proxies. Similar to previous results, the relationship between family ownership and exposure is in the cubic form and the inflection points are 35.54% and 76.32% respectively. The findings on hedging proxy variables are mixed. The book-to-market ratio (BM) has a negative sign. The dividend payout ratio (DIV_PAY) has an expected negative sign predicted by the theory, which confirms that firms with higher liquidity hedge more and face less exposure. The coefficient on the third variable debt to equity ratio, DE, does not have a negative sign as expected by the hedging theory. The positive sign of debt to equity ratio implies that firms with greater probability of financial distress, as proxied by leverage, have higher exposure. This finding is consistent with Hutson and Stevenson (2010) and can be explained by the fact that if high-levered firms are not fully hedged, the exposure of these firms would be higher due to the adverse impact of exchange rate shocks on the firm’s debt paying capacity.

(Insert Table VI about here)

Analysis with alternative exchange rate exposure estimates

In order to make the results comparable to previous studies, the robustness is further examined, taking alternative exchange rate exposure estimates as dependent variable in equation (2). Choi and Prasad (1995) argue that only significant exposure coefficients should be considered as dependent variable to explore the determinants of exposure in cross-sectional analysis because, if the exposure is insignificant, it cannot be used to derive any reliable conclusion. Following their argument, several studies (Aggarwal & Harper, 2010; Hutson & O’Driscoll, 2010; Ye et al., 2014) have used significant exposures in the second stage analysis. Table VII presents results from the re-estimation of equation (2) with significant exposure estimates at 10 percent significance level. The primary findings do not change when significant exposure coefficients are used, and this verifies the robustness of the results.

(Insert Table VII about here)
Endogeneity Concerns

Theoretically, the endogeneity due to reverse causation cannot be expected in the relationship between ownership structure and exchange rate exposure. This assumption mainly follows the argument by Stiglitz (1994, Chapter 10) that ownership structure is an exogenous determinant of firm performance in emerging economies, because the illiquid capital markets in these countries make it difficult for investors to trade and change ownership structure in response to changing circumstances. Studies by Selarka (2005) and Balasubramanian (2010) have also mentioned that specifically emerging markets like India, endogeneity might not be a major concern in this regard.

The extent empirical literature on exchange rate exposure too has not documented about the possibility of endogeneity concerns. Hence, the issue of endogeneity can be kept aside in the given context.

FINDINGS AND IMPLICATIONS

We explore the potential relationship between family ownership and exchange rate exposure. We find that exchange rate exposure increases with family ownership at low and high levels (as a result of the entrenchment or expropriation effect) and decreases with family ownership at intermediate levels (as a consequence of the convergence-of-interest or monitoring effect). Our findings complement the work of Hutson and Stevenson (2010) which find that strong country-level governance mechanisms reduce exchange exposure of firms. The findings are robust to alternative measures of exposure coefficients and to proxy indicators for firms’ hedging activities.

The findings underline the importance of taking into account the family ownership in resolving the existing exposure puzzle and suggest that ownership structure may explain why hedging is ineffective for some firms and why few firms not able to reduce their exposure to exchange rate risk. Our study also adds to the existing theoretical literature, which suggests that corporate governance environment has a significant role in influencing the value enhancing managerial activities. Our study has important implications on how investors should assess firm’s exposure to exchange rate risk and suggests that how family ownership structure can be used appropriately to manage the exposure of firm.

In the context of India, most of the firms are family dominated. The findings of the study are useful for the firms having different levels of family ownership. The firms having low and high
levels of family ownership should focus on various ways to reduce the involvement of managers into non-optimum hedging activities. This might be achieved either through stricter monitoring or by providing more attractive compensation structures. Another implication of these findings is that these firms should try to explore alternative hedging policies like natural hedges, operational hedges that are less reliant on the use of currency derivatives by managers and involves more engagement of board and other shareholders. With this, the possibility of the sub-optimal hedge by managers might be reduced. The monitoring by outsider owners may also have a significant impact over this.

CONCLUSION

This paper provides new evidence on the relationship between family ownership and exchange rate exposure. To the best of our knowledge, this study is the first to provide evidence that the relationship between family ownership and exchange rate exposure is nonlinear in nature in the cubic form. The study finds that exchange rate exposure increases with family ownership at low and high levels (as a result of the entrenchment or expropriation effect) and decreases with family ownership at intermediate levels (as a consequence of the convergence-of-interest or monitoring effect). Our study has important implications for managers, shareholders and other investors who are associated with the assessment of the firm’s exposure to exchange rate risk. Unlisted firms are not a part of our study due to the adoption of market-based definition of exposure. The future research may focus on the exposure of unlisted firms taking their earnings and cash flows as a proxy for firm value. The future research might consider the other measures of firm level governance such as compensation structures of managers. The paper can also be extended to include more specific characteristics of family ownership structure and their effects on exposure.
REFERENCES


Table I

Industry classification and international trade pattern of sample firms

<table>
<thead>
<tr>
<th>Industry Group</th>
<th>Industry Sub Group</th>
<th>No. of Firms</th>
<th>Percentage of Total Firms</th>
<th>Average Exports/Total Sales (%)</th>
<th>Average Import ratio (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>Food and Agro based products</td>
<td>45</td>
<td>6.90</td>
<td>23.12</td>
<td>11.63</td>
</tr>
<tr>
<td></td>
<td>Textiles</td>
<td>46</td>
<td>7.06</td>
<td>33.22</td>
<td>19.03</td>
</tr>
<tr>
<td></td>
<td>Chemical, Plastic and Petroleum products</td>
<td>152</td>
<td>23.31</td>
<td>21.66</td>
<td>25.17</td>
</tr>
<tr>
<td></td>
<td>Consumer Goods</td>
<td>35</td>
<td>5.37</td>
<td>30.22</td>
<td>22.80</td>
</tr>
<tr>
<td></td>
<td>Construction Materials</td>
<td>37</td>
<td>5.67</td>
<td>11.34</td>
<td>19.03</td>
</tr>
<tr>
<td></td>
<td>Metal and Metal products</td>
<td>44</td>
<td>6.75</td>
<td>17.19</td>
<td>26.54</td>
</tr>
<tr>
<td></td>
<td>Machinery</td>
<td>75</td>
<td>11.50</td>
<td>14.30</td>
<td>24.00</td>
</tr>
<tr>
<td></td>
<td>Transport Equipment</td>
<td>51</td>
<td>7.82</td>
<td>10.37</td>
<td>17.43</td>
</tr>
<tr>
<td></td>
<td>Miscellaneous Manufacturing</td>
<td>23</td>
<td>3.53</td>
<td>13.18</td>
<td>22.51</td>
</tr>
<tr>
<td></td>
<td>Diversified</td>
<td>16</td>
<td>2.45</td>
<td>11.81</td>
<td>26.66</td>
</tr>
<tr>
<td>Mining</td>
<td></td>
<td>6</td>
<td>0.92</td>
<td>37.63</td>
<td>21.50</td>
</tr>
<tr>
<td></td>
<td>Electricity</td>
<td>5</td>
<td>0.77</td>
<td>5.90</td>
<td>9.20</td>
</tr>
<tr>
<td>Services</td>
<td>Hotel and Tourism</td>
<td>12</td>
<td>1.84</td>
<td>42.00</td>
<td>7.00</td>
</tr>
<tr>
<td></td>
<td>Wholesale and Retail trading</td>
<td>20</td>
<td>3.07</td>
<td>13.00</td>
<td>30.10</td>
</tr>
<tr>
<td></td>
<td>Transport Services</td>
<td>7</td>
<td>1.07</td>
<td>14.50</td>
<td>18.65</td>
</tr>
<tr>
<td></td>
<td>Communication Services</td>
<td>4</td>
<td>0.61</td>
<td>13.98</td>
<td>17.29</td>
</tr>
<tr>
<td></td>
<td>IT</td>
<td>38</td>
<td>5.83</td>
<td>71.50</td>
<td>7.76</td>
</tr>
<tr>
<td></td>
<td>Miscellaneous Services</td>
<td>16</td>
<td>2.45</td>
<td>7.30</td>
<td>26.23</td>
</tr>
<tr>
<td>Construction and Real Estate</td>
<td></td>
<td>19</td>
<td>2.91</td>
<td>12.80</td>
<td>10.71</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>651</td>
<td>100</td>
<td>22.20%</td>
<td>24.77%</td>
</tr>
</tbody>
</table>
Table II

Summary Statistics for family ownership and control variables

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Mean</th>
<th>Median</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAMILY</td>
<td>0.524</td>
<td>0.523</td>
<td>0.147</td>
<td>0</td>
<td>0.936</td>
</tr>
<tr>
<td>HEDGE</td>
<td>0.513</td>
<td>1</td>
<td>0.5</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Export Sales to Total Sales</td>
<td>0.223</td>
<td>0.109</td>
<td>0.263</td>
<td>0</td>
<td>0.992</td>
</tr>
<tr>
<td>Total Assets (Million)</td>
<td>24371.53</td>
<td>4417.969</td>
<td>103511.8</td>
<td>43.792</td>
<td>1584990</td>
</tr>
<tr>
<td>Size (Log of Total Assets)</td>
<td>8.492</td>
<td>8.393</td>
<td>1.625</td>
<td>3.779</td>
<td>14.276</td>
</tr>
</tbody>
</table>

Table III

Summary of exchange rate exposure coefficients

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of firms with significant exposure</td>
<td>434</td>
</tr>
<tr>
<td>% of sample firms with significant exposure</td>
<td>66.6%</td>
</tr>
<tr>
<td>No. of firms with positive significant exposure (10% level)</td>
<td>434</td>
</tr>
<tr>
<td>No. of firms with negative significant exposure (10% level)</td>
<td>0</td>
</tr>
<tr>
<td>Average value of significant exposure coefficients</td>
<td>1.668</td>
</tr>
<tr>
<td>Average value of exposure coefficients of all firms</td>
<td>1.317</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.562</td>
</tr>
<tr>
<td>Maximum</td>
<td>4.491</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>0.623</td>
</tr>
</tbody>
</table>
Table IV
Robustness of exposure coefficients

<table>
<thead>
<tr>
<th></th>
<th>Exposure to REER</th>
<th>Exposure to NEER with alternative market index</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of firms with significant exposure</td>
<td>423</td>
<td>437</td>
</tr>
<tr>
<td>% of firms with significant exposure</td>
<td>65%</td>
<td>67%</td>
</tr>
<tr>
<td>No of Firms with positive significant Exposure (10% level)</td>
<td>423</td>
<td>437</td>
</tr>
<tr>
<td>No of Firms with negative significant Exposure (10% level)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Average value of all exposure coefficients</td>
<td>1.253</td>
<td>1.316</td>
</tr>
<tr>
<td>Average value of significant exposure coefficients</td>
<td>1.616</td>
<td>1.663</td>
</tr>
<tr>
<td>Minimum</td>
<td>-0.974</td>
<td>-1.297</td>
</tr>
<tr>
<td>Maximum</td>
<td>3.883</td>
<td>4.490</td>
</tr>
<tr>
<td>Standard deviation.</td>
<td>0.759</td>
<td>0.779</td>
</tr>
</tbody>
</table>

Table V
The impact of family ownership on exchange rate exposure

Dependent Variable: |βsi |

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Coefficients</th>
<th>t-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.380</td>
<td>0.798</td>
</tr>
<tr>
<td></td>
<td>Net exports</td>
<td>to Total Sales</td>
</tr>
<tr>
<td>Size</td>
<td>0.007</td>
<td>0.355</td>
</tr>
<tr>
<td>HEDGE</td>
<td>-0.010</td>
<td>-1.890*</td>
</tr>
<tr>
<td>FAMILY</td>
<td>5.494</td>
<td>2.108**</td>
</tr>
<tr>
<td>FAMILY²</td>
<td>-10.909</td>
<td>-2.077**</td>
</tr>
<tr>
<td>FAMILY³</td>
<td>6.273</td>
<td>1.838*</td>
</tr>
<tr>
<td>Industry Dummies</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Adjusted R-Square</td>
<td>0.088</td>
<td></td>
</tr>
<tr>
<td>F- statistics</td>
<td>3.610***</td>
<td></td>
</tr>
<tr>
<td>No. of Observations</td>
<td>651</td>
<td></td>
</tr>
<tr>
<td>Inflection Points</td>
<td>36.97%</td>
<td>78.90%</td>
</tr>
</tbody>
</table>

White heteroskedasticity-consistent standard errors are used. Numbers in the parentheses under the coefficients are the associated t-statistics. ***, **, * and ^ indicates statistical significance at 1%, 5%, 10% and 15% respectively.
Table VI

The impact of family ownership on exchange rate exposure with alternative hedging controls

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Coefficients</th>
<th>t-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.453</td>
<td>0.96</td>
</tr>
<tr>
<td></td>
<td>Net exports</td>
<td>to Total Sales</td>
</tr>
<tr>
<td>Size</td>
<td>0.002</td>
<td>0.096</td>
</tr>
<tr>
<td>BM</td>
<td>-0.037</td>
<td>-2.420**</td>
</tr>
<tr>
<td>DIV</td>
<td>-0.042</td>
<td>-0.552</td>
</tr>
<tr>
<td>DE</td>
<td>0.065</td>
<td>2.455**</td>
</tr>
<tr>
<td>FAMILY</td>
<td>5.229</td>
<td>2.018**</td>
</tr>
<tr>
<td>FAMILY^2</td>
<td>-10.344</td>
<td>-1.983**</td>
</tr>
<tr>
<td>FAMILY^3</td>
<td>5.984</td>
<td>1.768*</td>
</tr>
</tbody>
</table>

Industry Dummies               Yes
Adjusted R-Square              0.106
F-statistics                   3.947***
No. of Observations            651
Inflection Points              35.54%
                              76.32%

White heteroskedasticity-consistent standard errors are used. Numbers in the parentheses under the coefficients are the associated t-statistics. ***, **, *, and ^ indicates statistical significance at 1%, 5%, 10% and 15% respectively.

Table VII
### The impact of family ownership on significant exchange rate exposure coefficients

Dependent Variable: $|\beta_{si}|$

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Coefficients</th>
<th>t-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.666</td>
<td>1.194</td>
</tr>
<tr>
<td>$</td>
<td>\text{Net exports}</td>
<td>/\text{Total Sales}$</td>
</tr>
<tr>
<td>Size</td>
<td>-0.013</td>
<td>-0.628</td>
</tr>
<tr>
<td>HEDGE</td>
<td>-0.023</td>
<td>1.366*</td>
</tr>
<tr>
<td>FAMILY</td>
<td>5.893</td>
<td>1.902**</td>
</tr>
<tr>
<td>FAMILY$^2$</td>
<td>-11.077</td>
<td>-1.823**</td>
</tr>
<tr>
<td>FAMILY$^3$</td>
<td>5.958</td>
<td>1.556^</td>
</tr>
</tbody>
</table>

Industry Dummies                          | Yes          |
Adjusted R-Square                           | 0.102        |
F- statistics                                | 3.176***     |
No. of Observations                          | 651          |
Inflection Points                            | 36.22%       |
                                        | 77.34%       |

White heteroskedasticity-consistent standard errors are used. Numbers in the parentheses under the coefficients are the associated t-statistics. ***, **, * and ^ indicates statistical significance at 1%, 5%, 10% and 15% respectively.
Figure 1: Relationship between family ownership and exchange rate exposure
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---

**Research**

Foreign exchange exposure, corporate governance, banking

**Publications**

**Research Journal Publications**


**Book Reviews/Conference Proceedings**


**Conference Presentations**

3. Sikarwar, E. 2013. The Unanticipated Sources of Exchange Rate Exposure and Hedging Activities of Indian Firms. 6th Doctoral Colloquium, Indian Institute of Management Ahmedabad, India
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