Founding Family Heritage, Social Background and Risk Taking by Family Firms

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Abstract

This paper analyzes the relation between founding family's heritage, social background and total firm risk using a sample of Indian firms from 2001 to 2015. We show that family firms have lower equity, cash flow and earnings volatility. This is particularly true of firms managed by older business families. There is some evidence that firms managed by family CEOs belonging to a business community are riskier. We document a non-monotonic relation between total firm risk and family ownership. We show that this is due to the non-linear relation between the extent of diversification, leverage, cash flow volatility, cash holdings and family ownership. Our results are generally robust to various tests for endogeneity, including instrumental variables regression, propensity score matching and firm fixed effects.

A central theme in the family business literature is whether family firms take more or less risk. In this paper we focus on how competition, growth prospects, and the social background of the founding family affects managerial choices in risk taking.

The literature on the impact of large shareholders on firm risk has documented conflicting results. From a financing perspective, Anderson, Mansi and Reeb (2003) find that the presence of founder families is associated with lower cost of debt financing. In other words, family ownership is associated with lower default or operating risk. Likewise, Croci et *al.* (2011) find that credit markets are likely to provide more long-term debt to family firms, which suggests that investors view family firms' investment decisions as less risky. Similarly, Jiang et *al.* (2015) find that religious founders take less risk than others.

From an investments perspective, using a sample of European firms, Faccio et al. (2011) show that firms controlled by diversified large shareholders undertake riskier investments than firms controlled by non-diversified large shareholders. Some families may take risks to maintain control for socioemotional reasons even if it is not in the interest of shareholders (Gómez-Mejía et al., 2007). Adams et al. (2005) hypothesize that as the degree of CEO influence increases, variability in firm performance also increases because decisions with extreme consequences are likely to be taken. They argue that the ability to influence is high when the CEO is also one of the founders of the firm or a lone insider on the board. They find that performance is more variable in firms in which the CEO has greater power to influence.

In an international sample, John, Litov, and Yeung (2008) find no significant relation between ownership concentration and corporate risk-taking. Anderson and Reeb (2003) find that measures of equity risk are not related to family ownership. Thus, there are three views on risk taking by family firms.

In our view it is important to examine the impact of family ownership in the context of product market competition, future growth opportunities and the societal structure. Although John, Litov, and Yeung (2008) control for competition as measured by Herfindahl index, their focus is not on family firms. They examine how the extent of investor protection as measured by accounting disclosure standards, the rule of law, and anti-director rights affects risk taking. Faccio et *al.* (2011) estimate a Herfindahl index in the context of wealth concentration of large shareholders (as their focus is on how diversification impacts risk taking), not product market

competition. In contrast, we study how other external forces such as product market competition, cultural heritage and biological predisposition affect risk taking. Our perspective is that risk choices are affected not just by family ownership but also the competitive context and growth opportunities. Founders or descendants may resort to less risky investments in order to consume private benefits (Morck, Wolfenzon, and Yeung, 2005; Stulz, 2005). But product market competition exerts pressure on families to undertake risky but value enhancing investments. In other words, our prediction on the relation between family ownership and risk taking depends on whether we incorporate competition or not. In a similar vein, founding families are more likely to undertake risky investments if they face better growth opportunities.

One of the features of Indian family business is the unusually high average level of equity ownership by the family, 49%[1], as compared to about 18% in the U.S., 38% in Europe and 6% in Japan. This high degree of family involvement appears to be due to less developed institutions and capital markets and poor legal protection for external investors (Khanna and Palepu, 2000), prompting outside investors and creditors to demand greater involvement on the part of founders. Because of this unusually high ownership, founders have both the incentive to take risk as well as be risk averse.

Jensen and Meckling (1976) predict that as manager-shareholder ownership increases, there is less incentive to extract private benefits. The high median family ownership interest in India is likely to reduce founding family incentives to convert firm resources into private benefits as the family ends up paying for a large fraction of every dollar of private benefits. In contrast, the incentives to expropriate corporate wealth are much higher when the family ownership is low. In other words, high ownership concentration increases the family's share of the costs of engaging in activities that harm minority shareholders such as the expropriation of minority shareholders' wealth and excessively conservative risk choices.

We argue that the agency conflicts of high Indian family holdings are mitigated due to the high cost of private benefits consumption and the external financing needs required to pursue attractive growth opportunities. The unusually high family holdings in Indian firms strengthen the positive incentive alignment effects thereby moderating any tendency to extract private benefits. However, both of these effects are likely to be weakened in the face of fierce product

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[1] The average family shareholding in 2010 was about 52%

market competition, which strengthens the influence of this external governance mechanism. While external governance covers many mechanisms such as competition, the disciplinary role of the market for corporate control, scrutiny from suppliers of capital and regulators, several of these forces are weak in India as in many emerging markets.

Likewise, we expect the economic and social context shapes a family's attitude towards risk. Specifically, any test of the relation between family ownership and risk taking may have to consider the historical context within which family firms emerged. For instance, the keiretsu in Japan emerged after the World War II and the collapse of zaibatsu. The keiretsu could be horizontally diversified business groups or vertical manufacturing networks or vertical distribution networks. A distinguishing feature of horizontal keiretsu is that companies are set up around a bank through cross holding relationships. Vertical keiretsu link suppliers, customers and distributors of one industry. When there are such interlocking networks or a financier within the business group, a firm may be better positioned to take risk and pursue an entrepreneurial opportunity. We would be overlooking an important aspect of family businesses in Japan if we do not account for this distinguishing feature. In a study of Indian family business groups Gopalan, Nanda and Seru (2007) find that intra-group loans are common and significant among firms affiliated to business groups. One of their key findings is that business groups tend to provide greater financial support to firms with larger insider ownership and firms with higher insider ownership are less likely to go bankrupt. Furthermore, firms affiliated to business groups (or families) have greater growth opportunities than non-group firms, more so after the pro-market reforms in India (Manikandan and Ramachandran, 2015). Since the group itself acts as a bank and affiliated firms have greater access to business opportunities, it is likely that firms founded and managed by business families are more likely to take risk. Large shareholders such as founding families may have the authority and incentives to reduce the discretion enjoyed by managers (Shleifer and Vishny, 1986). Therefore, family firms may have less conservative investment policies than non-family firms.

Our analyses shed light on the effect of relatively unexamined factors such as the degree of competition and growth prospects, ethnic background of founders, and the cultural heritage of families on corporate risk-taking. We add to the family business literature in several ways.

First, family firms are unique in ownership, governance, management succession and these attributes influence strategic choices. We study how each of these factors affects the risk choice of family firms. We recognize that a firm may be led by a family member or an outsider and model its impact on risk taking. Since a median family firm owns 50% of the voting stock and in a large number of firms either the founder or a descendant is the CEO, the ability of the CEO to influence corporate decisions is very high. And this may be crucial for risk taking. Thus, our setting allows for a sharper test.

Second, we examine how the ethnic background of the founder influences risk taking. Prior research shows that individuals' attitude towards risk and uncertainty is at least partly shaped by cultural heritage (Chen, 2013; Becker, Dohmen, Enke, and Falk, 2015). Indian family firms are loosely similar to LBO partnerships in the U.S.A. with the holding company or the family (that controls the holding company) serving as the majority shareholder. Many of these families emerged when India was a British colony. They undertook trading and manufacturing to serve the British industry. These businesses are characterized by community networks that facilitate the flow of capital, trading and information sharing about business opportunities[2]. Several prominent Indian businesses are older than independent India. We posit that those families with a long history of being in business may be better positioned to manage risk and implement product market strategies than newer families or non-family firms because they would have access to capital and government (for approvals). Consequently, affiliation to one of the older business families may determine risk taking. Many of these older business families (e.g. the house of Tata) have a long history of funding academic institutions, hospitals, and community development projects through trusts owned by the founding family. The trusts are dependent on the dividend income from group entities to fund their philanthropic activities. As a result, we expect firms belonging to the older business families to be more stable i.e. less risky, especially in terms of cash flow volatility.

Third, biologically predisposed behaviors, culturally transmitted preferences are determined early in life, persistent, and hence fundamental to understanding an individual's economic decisions (Giavazzi et al., 2019). A firm's shared risk attitudes are transmitted from one generation of corporate leaders to the next. Unlike societal culture that may change from one

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[2] In the next section we describe the setting in greater detail

generation to another, a firm's history and thus its risk culture can be traced back to its beginning and to the people who founded the firm (Guiso et al. (2015a)). An executive's social class origins may have a lasting and varying impact on his or her preferences, affecting his or her tendency to take risk (Kish-Gephart and Campbell, 2015). Executives' formative childhood experiences with social class may influence their strategic choices. An individual's caste or religion is an important aspect of his or her culture. Therefore, the social background of the entrepreneur may be a determinant of his propensity to take risk. Earlier research shows that religious people are risk-averse (see Hilary and Hui, 2009, Baxamusa and Jalal, 2016, and papers cited therein). These papers propose that family-firms founded by religious founders take less risk than other family-firms. In contrast, we propose that firms that are founded by individuals from business (ethnic) communities are more likely to take risk. The Indian society is organized into castes (or communities within the main religion) for thousands of years. The caste system segregates the society into four groups- Brahmin (the priest class who officiate at religious ceremonies), Kshatriya (soldiers and kings), Vaishya (the business class), and Sudra (those who undertake manual labor). Under each group there are several subsects or castes that can be identified by surnames. Although with the evolution of the Indian society this segregation has been diluted to some extent, the society broadly adheres to the same pattern even now. As a British colony till 1947, India was a market for manufactured goods of Britain and also exported primary products to the British industry (Mahadevan, 2012). The financing of the export trade in primary products such as raw cotton, jute, and oil seeds and the distribution of the imported manufactured goods was in the hands of merchants from distinct business communities (or castes)[3]. The intra-caste credit and trade networks facilitated wealth generation within these communities. The ability to raise capital in an underdeveloped economy, access to information on investment opportunities, and a natural capacity to take risk allowed merchants from these traditional communities to prosper. It enabled them to seize business opportunities when they arose[4]. Business communities were crucial in facilitating wealth generation by family firms. But with social and economic changes community structures became less relevant. Yet these communities share a common

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[3] These castes included the Parsis, the Marwaris, Gujarati Banias and Jains, Multanis, Bhatias and the Chettiars.

[4] For instance, Parsis and Banias entered the textile industry and Marwaris entered consumer goods industries. Other conservative communities such as Chettiars, Shikarpuris, Khojas and Memons chose to remain bankers and traders.

trait: their ability to act on business opportunities. People belonging to a business caste would have a natural propensity to undertake business although nothing prevents individuals from other castes to pursue a business opportunity. We recognize that a firm may be founded or led by a member of one of the business castes or someone who does not. And this distinction may be important for managerial risk taking. This is particularly important for family firms in which a family member also acts as the CEO.

This paper also contributes to the literature of how managerial background, skills and traits affect corporate decision making. CEOs' managerial styles reflects their individual life and career experiences (e.g., Graham and Narasimhan (2005), Malmendier and Tate (2005), Malmendier, Tate, and Yan (2011), Benmelech and Frydman (2014), Lin, Ma, Officer, and Zou (2014), Schoar and Zuo (2013), Dittmar and Duchin (2015), Bertrand and Schoar (2003), Cain and McKeon (2012), Cronqvist, Makhija and Yonker (2012), Malmendier and Tate (2008), Faccio et al. (2016) and Bernile et al. (2017). These studies indicate that exposure to a particular macroeconomic or personal event, or the manager's gender has an effect on risk-taking by the CEO and consequently on corporate policies. We add to this literature by showing that the social background of the CEO is yet another important variable leading to differences in corporate risk choices. We study how the affiliation to a (business) community affects one's risk taking attitude. Those who are exposed to the consequences of business decisions that their family members make may be more sensitized to risk taking early in life and this may impact their decision making when they reach leadership positions in their organizations.

Using firm level data for 510 firms from 2001 to 2015 we examine the relation between family ownership, social background of founding family members and risk taking. We measure risk taking in three ways: the annual volatility of stock returns, the volatility of a firm's cash flow from operations scaled by total assets and the volatility of ROA (defined as EBITDA divided by Total Assets * 100). In the empirical literature on risk taking some authors focus on firm policies. We focus on outcome variables such as stock return and cash flow volatility rather than firm policies. But we explain our results by linking them to the extent of diversification, levels of leverage and cash holdings. Our main result is that family firms have lower equity, cash flow and earnings volatility after controlling for competition and growth opportunities, especially when family members are in leadership position. This is true of firms managed by older business

families as well. We document a U shaped relation between family ownership and total firm risk (stock return volatility). There is some evidence that firms managed by family CEOs belonging to a business caste are riskier. We recognize that endogeneity is a concern in establishing a relation between family ownership and risk taking. We take a number of steps to address the issue of endogeneity. First, we employ instrumental variable regression to examine the relation between family ownership and firm risk. Second, we employ propensity score matching to compare family and non-family firms. Third, we use firm fixed effects in our panel regressions. Our results are generally robust to the use of alternate methodologies. Finally, we explain our results by examining the extent of diversification, leverage choices and cash holdings of family and non-family firms.

The rest of the paper is as follows. Section I presents a discussion of the related literature and hypotheses. Data, methodology, and sample are described in Section II. The empirical results are presented in Section III. In Section IV we present robustness checks. Section V presents explanations for the observed risk taking behavior of family firms. Section VI concludes.

I.   Related Literature

In this section we present arguments that suggest both positive as well as negative relation between family ownership and risk taking.

Family Involvement Jensen and Meckling (1976) observe that diversified shareholders have the incentive to expropriate bondholder wealth by investing in risky, high return projects (referred to as asset substitution). However, large shareholders with large undiversified ownership stakes may have different incentives than small shareholders (Shleifer and Vishny, 1997). Founding families are a class of investors that are more concerned about firm survival, which can potentially alleviate agency conflicts. The combination of undiversified family shareholding and concerns over family and firm reputation (preservation of socio-emotional wealth hypothesis) makes family shareholders to value firm survival more than other types of shareholders and they may avoid strict adherence to shareholder wealth maximization. Therefore, it could be that family firms are associated with less risk. However, families in emerging markets may have the necessary resources and networks to implement new and innovative strategies, which non-family

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firms may lack. This would imply the opposite. We expect competition and growth prospects to play a moderating role.

Family Ownership An increase in family ownership results in better alignment of interest between founding family managers and outside shareholders. Consequently, they would have the incentive to take risk and grow their firm. On the other hand, agency theory predicts insufficient risk-taking by managers and CEOs as their equity interest in the firm grows. Founders may have sufficient voting rights to block resolutions that drastically change the strategic direction of the firm or take on significant risk (e.g. by internationalization). Studies on public companies with diffused ownership and family firms in developed markets find supportive evidence (Kim and Lu, 2011).

Insiders may divert corporate resources to consume private benefits of control and may play safe by accepting less risky projects. The extent of resources diverted depends on the degree of investor protection in the country (Shleifer and Wolfenzon, 2002). Emerging markets such as India may have poor investor protection because of which wealth expropriation may be high. However, many emerging markets have passed governance legislations similar to the developed west, which limits managerial discretion. Legal institutions evolve with time. As a result, outright expropriation is difficult. But creeping expropriation is a possibility. These economies are also dominated by banks. That is, banks finance much of all the capital expenditure although these economies have active capital markets. Banks may limit risk taking by firms to protect their investment (John et *al.* 2008). While banks may actively monitor their investments, they do so imperfectly. Since emerging markets offer numerous growth opportunities and banks themselves are under pressure to win business from prominent business families, founders may take on business gambles at the expense of lenders.

Research in behavioral finance shows that individuals are more optimistic about outcomes which they believe are under their control (see Malmendier and Tate, 2005 and the papers cited therein) and they are more likely to overestimate outcomes to which they are committed. If a CEO has the power to exercise his veto against his firm's strategy and decides whether or not a project is undertaken, the position may induce the CEO to believe that he can also control the outcome and to underestimate the probability of failure. While this is true of any

firm it is especially true of family firms when founders have a high equity ownership. Our setting allows us to investigate whether the high equity ownership prevalent in India results in higher risk taking. At high ownership concentration prevalent in India (as in other East Asian countries), family firms may take a long-term perspective and undertake risky but positive NPV projects, especially under fierce competition (strong external governance), which may remedy the agency-induced insufficient risk-taking. This argument motivates us to put forth the following hypothesis:

The higher ownership promotes risk-taking, and it does not aggravate risk-aversion (because families have 'more skin in the game'). It is likely that there is a curvilinear relation between family ownership and risk taking. That is, risk taking may reduce at lower ownership levels because of insufficient incentives and increase as ownership increases.

Family History The preservation of intergenerational transfer hypothesis (the desire to bequeath the firm to successors) suggests that older business families are likely to take less risk because they care more about intergenerational transfer of firms. Most of the older business families have been in existence for several decades[5]. Therefore, we hypothesize that *firms owned by older families take less risk.*

Social Background Prior research shows that religion matters for corporate decision making (e.g. Hillary and Hui, 2009, Miller and Hoffman, 1995 and Miller, 2000, Jiang et al. 2015). In the context of Christianity researchers classify a subject as either Catholic or Protestant and examine how this background affects decision making. In our context the heterogeneity is high[6]. As pointed out above, we can identify a person's caste by his surname. For example, Brahmins would have surnames such as Bhat, Iyer, Iyengar, Kashyap, Mishra, and Tripathi; Kshatriyas would have surnames such as Khurana, Mohanty, Patnaik, and Khatter. Vaishya names would end with Agarwal, Gupta, Jindal, Goenka, Arya, Choski, and Maheswari.

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[5] The older business families in India include the House of Tata, Birla, Murugappa, Ambani, Thapar, Dabur, Wadia, Godrej, Kirloskar, K C Mahindra, Singhania and Modi.

[6] The business communities of India include Agarwals, Oswals, Maheshwaris, Khandelwals, Mittals, Khatri, Lohana, Kammas, Gounders, Reddys, Rajus, Goud Saraswats, Parsis, Khojas, Bohra, Patels, Reddys, Chettiars, and Syrian Christians.

We hypothesize that firms headed by family members belonging to a business caste would be riskier.

II.   Data, Methods and Sample

Our initial sample consisted of all firms listed on the National Stock Exchange (NSE) during 2001-2015. Of the firms listed on the NSE, firms belonging to the following categories were eliminated:

- Banking, Insurance and Financial firms: These firms were excluded because they are subject to a different set of regulations and their financial statements are differently structured thus making a comparison difficult.
- Foreign firms: Foreign firms were excluded because they are subject to differential taxation and have markedly different management practices compared to domestic family and non-family firms

After eliminating firms on the basis of the above-mentioned criteria we obtained a final sample of 510 firms. The firms in our sample represent all industry groups such as manufacturing (75%), Information and communication (3%), construction and real estate (5%), wholesale and retail trading (8%), accommodation and food services (3%), agriculture (2%), transport (1%) and others (3%). We obtained the annual data on firm characteristics, ownership, governance and accounting performance from the CMIE Prowess database and stock market data from the National Stock Exchange of the India website.

A. Risk Taking

We consider three measures of risk. Our primary measure of total firm risk is the annualized standard deviation of monthly stock returns because our sample consists of listed firms. This measure is commonly used in prior literature (e.g. Cain and McKeon, 2016).

Investors and managers rely on the level and volatility of cash flows for the purpose of valuation and corporate decision making. Consequently, our second measure of risk is the standard deviation of cash flow from operations scaled by total assets.

While corporate earnings estimates come with noise, they are still useful in measuring firm risk. Therefore, our third measure of risk is the volatility of return on total assets measured

as EBITDA/Total Assets multiplied by 100. It captures the riskiness of investment decisions (Faccio et al. 2016; John, Litov and Yeung, 2008). We calculate the standard deviation of ROA, cash flow and stock returns over eleven 5-year, overlapping, windows (2001-2005, 2002-2006, 2003-2007, 2004-2008, 2005-2009, 2006-2010, 2007-2011, 2008-2012, 2009-2013, 2010-2014 and 2011-2015).

B. Control Variables

We measure all independent variables at the first year-end of the sample period over which the volatility of the dependent variable is measured. Since key variables such as family ownership and firm performance have been defined differently by different researchers in the field with little consensus (Upton et *al.,* 1993), we define the family firm as follows:

A family firm is one:

1) that was set up by an individual or a family at the beginning
2) that has the founder or founder's family member as CEO and/or Chairman and
3) in which the founder (or founder's family) holds at least 15% of voting stock

To ascertain whether a company satisfies condition (1) we manually read through company histories available on the company websites and classified firms as family owned or not. We hand-collected the data on board composition from company websites and then classified firms as controlled by the founder or a descendant or an outsider. Although we classify a firm as family or non-family in 2001, the ownership structure is stable through time in our sample. The last criterion is, however, redundant because the firms that satisfy the first two conditions do not hold less than 15% of shares. On average, the founders of a family firm in our sample own a little more than 49% of voting shares. Our definition of family firm is consistent with the definition in Chua et *al*. (1999) and other papers on family firms. Our sample consists of firms in which founders and descendants play leadership roles[7]. We include a dummy set equal to 1 if the firm belongs to the older business families in India, which includes the house of Tata, Murugappa, Thapar, Dabur, Birla, Wadia, Godrej, Kirloskar, K C Mahindra and J C Mahindra, Singhania and Gujarmal Modi. Similarly, we construct a dummy variable equal to 1 if the CEO

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[7]There are no family firms in our sample in which the founding family is a passive investor.

is from a business caste. We do this by manually matching the surname of the CEO with typical surnames found in business castes.

Firm Profitability is measured as annual Return on Assets (*ROA*), defined as the ratio of Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA) to Total Assets. When a firm is profitable family members may be encouraged to take more risk. So we posit a positive relation between ROA and risk taking. *Family ownership* is the cumulative total of shares (expressed as a fraction of total shares outstanding) held by the founder and his family members. *Firm size* is measured as the natural log of total assets. In many firms in our sample, a family member acts as the board chair or CEO. In a smaller number of firms an outsider is the CEO with family members occupying prominent board positions (e.g. as chair). In the former case, founding family members already hold substantial equity because of which agency conflicts are mitigated. In the second situation it is necessary to control for agency conflicts. *Herfindahl Hirschman Index* is the sum of squares of percentage market share of all firms in our sample in each industry and in each year. Lower index values indicate more competitive product markets. *Annual Volatility* is the standard deviation of stock returns measured annually. *Firm age* is defined as the number of years of firm's existence since inception. It controls for the life cycle effect. The longer a firm is in existence the more measured a firm would be in risk taking. In other words, such firms value survival more. *Leverage* is measured as the ratio of total debt and firm value (i.e. debt plus equity). We take market-to-book ratio as proxy for growth opportunities and construct a dummy variable equal to 1 if the firm has above-the-median market-to-book ratio (High M/B). We control for *asset tangibility* by taking the ratio of fixed assets and total assets. Corporate Governance characteristics such as board independence and institutional shareholding, may have a bearing on risk taking. Independent directors are expected to prevent the firm's managers from excessive risk taking. Board Independence is defined as the proportion of independent directors on the board as a fraction of board size. The choice of control variables is broadly in line with prior studies such as Faccio et al. (2016), Cain and McKeon (2016), and Pan et al. (2019).

C. Descriptive Statistics

Table I presents descriptive information for our sample of firms. It shows minimum, maximum, standard deviations, and mean values of the key variables in our sample. It also shows the results of difference of means tests between family and non-family firms. Anderson and Reeb (2003) find that family firms in the U.S.A sell at greater Q and use fewer independent directors. We find the opposite. Our univariate analysis suggests that family firms have more tangible assets, hire more independent directors, and are more diversified. They are older, less leveraged, more profitable and have more growth opportunities. They sell at lower Q and have a greater proportion of independent directors on their boards. Family firms have lower stock return and ROA volatility. Table II presents a simple correlation matrix of all variables used in our analysis. We find no significant association between family ownership and volatility of stock returns or cash flows but family firms have lower ROA volatility. They are likely to be in less competitive industries.

III. Empirical Results

In this section we present the main results of the paper. We undertake a panel regression with standard deviation of annualized stock returns, standard deviation of cash flow from operations scaled by total assets and standard deviation of ROA (multiplied by 100) as the dependent variables. We estimate the following regression equations:

$$RISK = \alpha_1 + \alpha_2 \text{ (Family Dummy)} + \alpha_i \text{ (Controls }_j) + \text{Industry Fixed effects} + \text{Time Fixed effects} + \varepsilon \tag{1}$$

$$RISK = \alpha_1 + \alpha_2 \text{ (Family Ownership)} + \alpha_3 \text{ (Family Ownership squared)} + \alpha_i \text{ (Controls }_j) + \text{Industry Fixed effects} + \text{Time Fixed effects} + \varepsilon \tag{2}$$

$$RISK = \alpha_1 + \alpha_2 \text{ (Family CEO* Old Business Family)} + \alpha_i \text{ (Controls }_j) + \text{Industry Fixed effects} + \text{Time Fixed effects} + \varepsilon \tag{3}$$

RISK = α_1 + α_2 (Family CEO* Business Caste) + α_i (Controls$_j$) + Industry Fixed effects + Time Fixed effects + ε (4)

A. Volatility of Stock Returns

If founding family's involvement and veto power due to the high shareholding has a bearing on risk taking, ex post realized volatility of equity returns should also depend on the CEOs' attitude toward risk, as captured by their affiliation to a family or a business community. For example, Cain and McKeon (2016) report a positive relation between CEO's background as pilot and stock return volatility. Bernile et al., (2017) find an inverted U shaped relation between CEO's early life exposure to a disaster and stock return volatility. In this section we examine how family ownership, the presence of a family member as CEO and the family's social background affect equity return volatility. In Table III we report the results of our panel regression with annualized standard deviation of monthly stock returns as the dependent variable. We control for firm size measured by total assets, leverage, R&D intensity (Hirschey and Weygandt (1985), Lev and Sougiannis (1996), and Chambers et al. (2002)), profitability (ROA), future growth opportunities (market-to-book ratio), firm age, intensity of competition (low Herfindahl index) and governance characteristics. Firms that have high leverage, high R&D investment, volatile sales growth or otherwise compete in highly competitive industries may be riskier. Likewise, a firm's future growth opportunities may impact the attitude of founding family towards risk. We construct a dummy variable (High M/B) set equal to 1 if the market-to-book ratio is greater than the median. Finally, we include industry and time dummies (coefficients not reported) to account for heterogeneity and potentially omitted variables.

In column 1 the variable of interest is the family dummy. The coefficient of the family firm dummy is statistically insignificant but economically significant. Family firms have 13.8% lower stock return volatility. In column 2 we test for nonlinear relation between volatility of stock returns and family ownership. The results suggest a U shaped relation. That is, volatility initially declines up to a point and then rises at higher levels of family ownership. The inflection point is at 30% of family ownership. This result supports our hypothesis that risk taking may reduce at lower ownership levels because of insufficient incentives and increase as ownership increases.

In column 3, the coefficient of family CEO dummy is significantly negative, which suggests that firms in which family members are CEOs are less risky. This is true of older business families as well (column 5). However, the coefficient of business caste CEO in column 4 is significantly *positive*, which supports our hypothesis that firms headed by family members belonging to a business caste would be more willing to take risk. Focusing on the control variables, the coefficient of firm age is significantly negative while that of firm size (i.e. total assets) is positive. We interpret this as evidence that younger and bigger firms are riskier.

B. Volatility of Cash Flows

Our second measure of risk is the volatility of cash flow from operations scaled by total assets. The control variables remain the same as before. We again employ a panel specification. All independent variables are measured at the end of first year of the sample period over which the volatility of cash flows is measured. The variables relating to family involvement, ownership and control in columns 1 through 5 of Table IV are all significantly negative at the 5% confidence level. When family ownership increases, cash flow volatility decreases. Firms in which founders are CEOs (column 3) have lower cash flow volatility. Firms with volatile cash flows may have difficulty in servicing debt or making capital investments or in paying dividends. Since founding families have long investment horizons, they are particularly concerned about the volatility of cash flows. While firms led by family CEOs belonging to a business caste have higher enterprise risk (i.e. volatility of stock returns), these firms have lower cash flow variability. There could also be a nonlinear relation between family ownership and cash flow volatility. We explore it in a subsequent section.

The coefficients of control variables suggest that older, bigger and less leveraged firms experience lower cash flow volatility in line with what we would expect. The coefficient on market-to-book ratio is positive, which indicates that growth firms are riskier. The coefficient on Low HHI indicator variable is surprisingly negative. We would expect firms operating in competitive industries to be more volatile. Our results suggest the opposite.

C. Volatility of Earnings

Khanna and Yafeh (2005) examine risk sharing by firms belonging to business groups in emerging markets and find no evidence of reduction in standard deviation of operating

profitability in many emerging markets. One of their key findings is that this is particularly true of India. In this section we examine whether family owned firms exhibit lower earnings volatility over a long time period. While earnings are estimated with noise, bias, estimation errors and are prone to smoothing, volatility of earnings could be useful in measuring total firm risk. In Table V we report the results of our panel regression with standard deviation of EBITDA/Total Assets multiplied by 100 as the dependent variable with standard errors clustered at the firm level. All independent variables are measured at the first year-end of the sample period over which the volatility of earnings is measured. In columns 1 through 4 we present the results of our regression analysis. The coefficient of family dummy in column 1 is negative and statistically significant. Firms in which family CEOs are in control exhibit lower volatility of earnings (column 2). Founding families may value stability in operating profits more highly because they constantly raise capital from banks and capital markets to pursue business opportunities. Column 3 suggests a U shaped relation between family ownership and earnings volatility. The inflection point is at 47% of family ownership. The coefficient of Family CEO * Old business family dummy is significantly positive, which suggests that firms belonging to older business families have more volatile earnings when a family member is in a leadership position. This is in contrast to what we would expect but is in line with the results of Adams et *al*. (2005). The founders' ethnic background is not related to earnings volatility. The coefficients of control variables indicate that smaller and more leveraged firms have more variable performance.

IV. Robustness Tests

In this section we undertake a series of robustness tests. In particular, family ownership and risk taking may be endogenous. We recognize that the correlation between risk taking and ownership structure may simply reflect unobservable characteristics that affect both ownership and risk taking. The omission of these characteristics may lead us to incorrectly attribute risk taking to family ownership. To address this concern we (1) run a two-stage instrumental variables regression (2) replace the regression analysis with propensity score matching procedure and (3) include firm fixed effects, which reduces the risk of spurious correlation.

A. Potential Endogeneity and Nonlinearity

Our analysis in the previous section potentially suffers from an endogeneity problem. Specifically, the issue is whether family firms take less risk or less risk prompts families to maintain holdings. Family members often hold leadership roles in their firms and are privy to confidential information about the firm's total risk. They may retain their holding only in those businesses that are less risky. In our sample, family shareholding is stable during the sample period. Feldman et al., (2016) show that family firms are less likely to divest a business especially when it is managed by the founder. So one can argue that families are not a class of investors who sell their equity or divest a business even when they have unfavorable view of the firm's risk. However, we use instrumental variables regression to establish a relation between total firm risk and family ownership. Demsetz and Lehn (1985) suggest that ownership is a function of firm size and risk. Accordingly, we model family ownership using the natural log of total assets, the square of the natural log of total assets, and beta as our instruments. Table VI presents instrumental variables, two stage least squares regression estimates. The relation between equity ownership structure and risk may also be nonlinear if the incentive structure of the equity owner changes as holdings increase (e.g., Morck et al. (1988)). Therefore, we regress our primary measure of firm risk (i.e. volatility of stock returns) on the predicted value of family ownership, square of the predicted family ownership, and other controls used in the previous regressions. Our analysis suggests a U shaped relation between family ownership and total firm risk. The inflection point is at 38.5% of family ownership. This result is consistent with the panel regression results presented in the previous section. The coefficient on Low HHI indicator variable is positive suggesting that firms in highly competitive industries are more volatile. The coefficient on leverage is negative. This is contrary to what one would expect. More leveraged companies should be more volatile, ceteris paribus.

B. Propensity Score Matching

As an alternative to the regression approach, we use Propensity Score Matching procedure using the nearest neighbor matching with replacement method to establish causality. We consider family ownership as the treatment, family firms as treated units, and non-family firms as untreated units. The outcome is the observed volatility in cash flow, stock returns and

ROA. The propensity score is estimated within a year-size category as a function of controls such as firm size, leverage, firm age, ROA, M/B, R&D intensity and competition (HHI). We employ a two-stage procedure to match scores. In the first stage, the probability of attracting family equity investment is estimated by a logistic regression in which the dependent variable is the family dummy, a binary variable, and the covariates are the observed characteristics of the vector. In the second stage, the predicted probabilities from the first stage are used as propensity scores to match observations from the two groups. That is, family firms are matched with non-family firms.[8] We employ nearest neighbor matching with replacement with caliper set equal to 0.2. The average differences in risk taking between family and non-family firms and the *t*-statistics are summarized in Table VII. Panel A shows the differences in stock return volatility between family and non-family firms. Although the difference in stock return volatility between family and non-family firms is statistically insignificant, it is economically significant (12.2%). Firms led by family members of older business families too exhibit lower volatility (14.26%). However, firms led by family CEOs belonging to a business caste are more volatile than other types of firms (7.2%). In Panel B we compare cash flow volatilities. Family firms exhibit significantly lower cash flow volatility when compared with non-family firms. This result is consistent with the results from panel regression presented earlier. Since families value stability more highly than non-family firms it is possible that they choose conservative investment policies. Panel C compares the volatility of ROA. Although family firms have lower earnings volatility, the differences are not statistically significant. As a further robustness check we repeat the analysis without replacement (unreported). The results are qualitatively similar.

C. Firm Fixed Effects

In this section we control for time invariant firm specific characteristics which may be correlated with omitted explanatory variables by adding firm fixed effects to the regression specifications. We estimate the following regression equations:

RISK $=\alpha_1 + \alpha_2$ Family Dummy $+ \alpha_i$ (Controls $_j$) + Firm Fixed effects + Time Fixed effects+ ε

(5)

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[8]We also verify that covariates are balanced across treatment and comparison groups.

RISK = α_1 + α_2 Family CEO* Old Business Family + α_i (Controls $_j$) + Firm Fixed effects + Time Fixed effects+ ε   (6)

RISK = α_1 + α_2 Family CEO* Business Caste + α_i (Controls $_j$) + Firm Fixed effects + Time Fixed effects + ε   (7)

In Tables VIII through X we replicate our earlier analysis but with firm fixed effects. The dependent variables in these tables are the three measures of risk. In general, our results do not change when we add firm fixed effects. Table VIII shows that family firms managed by family CEOs and, especially, older families have lower equity volatility. However, when family CEOs belonging to a business caste are in leadership positions, the equity volatility is higher. The coefficients of family dummy and family CEO dummy in Table IX are negative indicating that family firms have lower cash flow volatility. This is true of earnings volatility as well (Table X). However, when family shareholding increases, earnings volatility increases (column 2, Table X). In summary, our results remain qualitatively similar when we employ alternate econometric methodologies.

V.   What Explains Our Results?

In this section we investigate why we observe a curvilinear relation between risk and family ownership. We consider mechanisms through which firms can change their risk profile. Founding families can reduce firm risk in two ways. First, families may pursue projects with imperfectly correlated cash flows in relation to existing businesses. That is, families may use corporate diversification as an efficient strategy to reduce risk. The extent of diversification may explain the nonlinear relation between equity risk and family ownership that we documented earlier. Second, families may use less leverage to reduce the probability of default.

A. Propensity to Diversify

If founders are overconfident or risk seeking, we would expect family firms to venture into far flung opportunities and dissipate shareholder value (Malmendier and Tate, 2008). This might be especially true of emerging markets where a small number of families control a large

fraction of entrepreneurial activity. Anderson and Reeb (2003) find that family firms engage in significantly less corporate diversification[9]. While this might be true of the U.S.A, emerging markets are different in their institutional context. Drawing from these studies we posit that the extent of diversification explains the differences in risk taking among family firms. Specifically, we hypothesize that diversification reduces as family ownership increases but increases at high levels of ownership. That is, we expect a U shaped relation between the extent of diversification and family ownership. And this results in a nonlinear relation between equity volatility and family ownership. The agency costs at lower and higher levels of family ownership are not similar. When the ownership is low, family firms may pursue diversification opportunities and take on business gambles at the expense of lenders. But at high levels of ownership, the founding family's desire to hold a portfolio of businesses to reduce total firm risk may take over. But these businesses could well be positively correlated thereby amplifying equity volatility. Indeed, in the next section we show that there is a curvilinear relation between cash flow volatility and family ownership. That is, cash flow volatility is high when family ownership is high. Our test examines whether there is a U shaped relation between the extent of diversification and family ownership. We estimate the following equation:

$$\ln (\text{Number of business segments}) = \alpha_1 + \alpha_2 \text{ Family Ownership} + \alpha_3 \text{ (Family Ownership squared)} + \alpha_i \text{ (Controls }_j) + \text{Industry Fixed effects} + \text{Time Fixed effects} + \varepsilon \qquad (8)$$

Our control variables include firm age, total assets (firm size), leverage, ROA (profitability), market/book ratio (growth opportunities), Sales growth rate, capital expenditure/sales (capital intensity), institutional shareholding (institutional monitoring), and proportion of independent directors on the board (board monitoring). Column 1 of Table XI presents the panel OLS regression results with the natural log of number of business segments as the dependent variable. Consistent with our hypothesis, the relation between diversification and family ownership is curvilinear. The inflection point is at 27% of family ownership. Diversification initially

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[9] Anderson and Reeb (2003) find that the relation between diversification and family ownership is U shaped. Diversification decreases with increasing family holdings and after reaching a minimum diversification begins to increase with increase in family shareholding.

decreases with family ownership and then increases. The regression analysis shows that older and bigger firms are more diversified whereas more profitable firms are less diversified.

B. Leverage

In a simple capital structure model, Lee (2015) shows that uncertainty aversion of managers decreases financial leverage. Conversely, an increase in the risk appetite of managers increases leverage. It is likely that family firms may use less debt or there may be a nonlinear relation between family ownership and leverage. At low levels of family ownership, the agency problem between founders and lenders is low. But as ownership increases, founding families may have both the control on the board to influence decisions as well as the incentive to expropriate wealth from lenders. Jensen and Meckling (1976) observe that diversified shareholders have incentives to expropriate bondholder wealth by investing in risky, high-expected return projects (asset substitution). Mueller and Inderst (2001) argue that concentrated ownership could be associated with a higher agency cost of debt.

Founding families with concentrated ownership essentially own a call option, which will be exercised only in those states where asset value is greater than the value of the debt. As firm risk increases, the option becomes more valuable causing a decline in the value of the debt claim.

Therefore, leverage may reduce initially but increase at higher levels of ownership. We test this conjecture. In column 2 of Table XI we regress leverage against the same set of variables as in column 1. In addition, we consider a dummy variable set equal to 1 if a firm is diversified. Diversified firms have less business risk just as a portfolio of securities is less risky than a single security. As a result, such firms can afford to have a greater degree of financial leverage.

The coefficients on family ownership and the square of family ownership in column 2 indicate that there is a nonlinear, U shaped relation between family ownership and the use of debt in the capital structure. Leverage reduces till the ownership is 64% and then increases. The coefficient of Founder CEO dummy in column 3 is negative, which suggests that founders use less debt than others and take less financial risk. This result is significant at the 1% level.

C. Nonlinearities in Cash Flow Volatility

As pointed out above, the relation between the extent of diversification and family ownership is non-linear. Although, in general, holding a portfolio of businesses reduces the total firm risk, the tendency of businesses to be correlated has increased over the years because of a general increase in the riskiness of the economy (i.e. India, in our case). This may result in non-linearity in cash flow volatility.

In this subsection we examine for nonlinear relation between cash flow volatility and family ownership. The dependent variable is the standard deviation of cash flow from operations scaled by total assets measured over rolling windows of 5 years from 2001-2015 (i.e. 2001-2005, 2002-2006 and so on). Control variables are measured at the end of the first year of each time window. The regressions include industry fixed effects and standard errors are clustered at the firm level. The control variables remain the same as in before. Table XII presents the results of panel regression. We find that cash flow volatility decreases initially with family ownership but increases after reaching a minimum. The inflection point is 47% of family ownership. This supports the notion that the U shaped relation in cash flow volatility may explain the curvilinear relation between stock return volatility and family ownership. The increased cash flow volatility at higher levels of family ownership gets transmitted to equity volatility because investors care about not only the absolute level but also the volatility of cash flows.

D. Cash Holdings

Finally, the level of cash holdings may explain the lower risk of family firms and non-linearity documented with regard to family shareholding. Since founding families value firm survival more than other classes of investors it is likely that family firms may maintain higher cash balances. This may be particularly true of firms affiliated with older business families. Agency problems at family firms may also result in higher cash holdings. Empirical evidence suggests that this is indeed the case (e.g. Capiro et al., 2019). The lower levels of leverage and cash flow volatility at a moderate level of shareholding coupled with high cash balances may explain the U shaped relation between total firm risk and family shareholding. Specifically, we expect an *inverted U* shaped relation between cash holdings and family shareholding. We posit that the higher levels of cash balance at medium levels of family shareholding act as a buffer and

reduce the risk of the enterprise.

Therefore, we regress cash to total assets (minus cash) on a range of firm level variables. The variables of interest are family dummy, old family dummy, family shareholding and the square of family shareholding. Table XIII reports the estimates from pooled cross sectional panel regressions where the dependent variable is the natural log of cash-to-asset minus cash ratio of the firms in the sample during 2001 to 2015. We follow Opler et al., (1999) in our choice of control variables. All independent variables are scaled by total assets after deducting cash and cash equivalents i.e. Assets = Total Assets - cash and cash equivalents for the same year except leverage, which is scaled by total assets.

We control for market-to-book ratio, a proxy for future growth opportunities, firm size measured by the natural log of total assets, R&D intensity measured by the ratio of R&D expenses and sales, Cash flow scaled by assets, net working capital excluding cash scaled by assets, capital expenditure scaled by assets, leverage measured by the ratio of debt and total assets, industry sigma, which is defined as the mean of standard deviations of cash flow/assets measured over the previous 5 years for firms operating in the same industry defined by the 2 digit SIC code and Dividend dummy, which is a dummy variable set equal to 1 if the firm paid a dividend in the given year and zero otherwise. Finally, we introduce industry and time fixed effects. The evidence in Column 1 shows that there is an inverse U shaped relation between family shareholding and cash holdings. The level of cash holding increases with family shareholding and then decreases after reaching a maximum. The point of inflection is at 56 % of family ownership. This confirms our prediction. Result in column 2 shows that family firms hold insignificantly more cash than non-family firms and the coefficient of old business family dummy in column 3 suggests that firms affiliated with old business families hold significantly more cash than other firms. The coefficients of industry volatility, cash flow, leverage, and dividend dummy are significantly positive. Firms operating in volatile industries may hold more cash as a precaution (Opler et al., 1999; Han and Qiu, 2007). More highly levered firms hold more cash in order to avoid default on debt service. Although dividends are not legal obligations, they are carved in stone. Firms hate to make changes in dividend policy. Such firms may hold higher cash balances to be able to pay dividends. The coefficients of capital expenditure and working capital are significantly negative implying that firms with higher Capex or working

capital requirement hold lower cash balances, contrary to what we would expect. Overall, our results are consistent with the baseline results.

VI.   Concluding Comments

Much of all economic activity in many emerging markets takes place inside family firms. 73% of firms in the Bombay Stock Exchange 500 index are family run. India presents a unique opportunity to study family firms' risk taking attitude because of the unusually high median family ownership – about 50%. Because of this unusually high ownership, founders have both the incentive to take risk as well as be risk averse. We contribute to the broader literature on corporate governance by examining the risk taking choices of owner-managers. We provide evidence that family ownership and the social background of founding families significantly affect risk taking choices. More precisely, family firms have lower volatility of stock returns and cash flows after controlling for competition and growth opportunities. This is particularly true of firms belonging to older business families of India. There is evidence that the relation between family ownership and risk is nonlinear. The effect of family ownership is statistically and economically significant. They also use less debt when founders are in control. The results are robust to various tests of endogeneity, including instrumental variable regression, propensity score matching and firm fixed effects. We show that the U shaped relation between total firm risk and family ownership can be explained by the extent of corporate diversification, leverage choices and cash holdings of family firms. We also find that firms run by family CEOs belonging to a business caste are riskier. Since family firms account for much of entrepreneurial activity it is necessary that they do not take excessive risk. Our study indicates that family firms are usually prudent in risk taking and that the social background of the founding family may be important in explaining volatility at the firm level.

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Appendix A: *Description of Variables*

Variable definition	Source
Panel A. Dependent Variables	
σ **(Stock Return)** Annualized standard deviation of monthly stock returns	Author
σ **(ROA) x 100** Standard deviation of EBITDA scaled by Total Assets x 100	Author
σ **(CFO)** Standard deviation of cash flow from operations scaled by Total Assets	Author
All dependent variables are measured over eleven 5-year, overlapping, windows (2001-2005, 2002-2006, 2003-2007, 2004-2008, 2005-2009, 2006-2010, 2007-2011, 2008-2012, 2009-2013, 2010-2014 and 2011-2015)	
Panel B. Family Firm Characteristics	
Family Shareholding Percentage of shares held by founding families	CMIE Prowess Database
Founder CEO Founder of the firm is the CEO	Company website
Family CEO * Business caste Family member who acts as CEO belongs to business caste	Company website Author
Family-CEO* Old Business Family Either Founder or Descendant is the CEO and belongs to an old business family	Company website Author
Panel C. Control variables	
ROA Ratio of EBITDA to Total Assets	Prowess/Author Computation
Firm Size Natural log of total assets	Same as above
HHI *Herfindahl Hirschman Index* - Sum of percentage market share (of sales) of all firms in each industry	Same as above
Firm age Number of years of firm's existence since inception	Same as above
Leverage Ratio of total debt and firm value (i.e. debt plus equity)	Same as above

Market -Book Ratio	Market value of equity divided by book value of equity	Same as above
Asset Tangibility	Ratio of fixed assets and total assets	Same as above
No. of Independent Directors/ Board Size	Proportion of independent directors on board	Same as above
Diversification Dummy	Dummy variable to indicate whether the firm is operating in multiple business segments	Same as above
Sales growth rate	Annual rate of growth of sales	Same as above
Institutional Shareholding	Percentage of shares held by institutional investors	Same as above
Industry Sigma	Mean of standard deviations of cash flow/assets measured over the previous 5 years for firms operating in the same industry defined by the 2-digit SIC code	Same as above
Dividend dummy	A dummy variable set equal to 1 if the firm paid a dividend in the given year and zero otherwise.	Same as above

Table I: Summary Statistics

This table reports summary statistics of the key variables and univariate tests of differences of means between family and non-family firms. Our sample consists of 510 firms (406 family and 104 non-family firms) with annual data for 15 years. All the variables are defined in Appendix A. Family firms are those firms where founding family holds at least 15% of stock and maintains board seats. Non-family firms are those firms without family ownership or have no family presence on the board. Family Shareholding is the percentage of shares held by the founding family. All the variables are winsorized at the 5% tail. Other variables include ROA (ratio of EBITDA to total assets), market to book ratio (M/B), tangibility (ratio of fixed assets to total assets), the Herfindahl Hirschman Index (HHI), number of independent directors on the board, percentage of shares held by institutional investors and sales growth rate. Stock return volatility is measured as the annualized standard deviation of monthly stock returns over 5-year overlapping year windows. Operating returns volatility and cash flow volatility are measured as standard deviations of EBITDA and cash flow from operations scaled by total assets measured over 5-year overlapping year windows i.e. 2001-2005, 2002-2006, 2003-2007 and so on. The significance of the differences in means is based on the Student t-test. The asterisk superscripts ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively

Variables	Full sample				Family firms	Non-family firms	Difference t-statistic
	Mean	Std.Dev.	Min	Max			
ROA	0.12	0.05	0.03	0.23	0.12	0.11	3.56***
M/B	1.50	1.53	0.09	5.85	1.52	1.43	2.11**
Tangibility	0.35	0.18	0.05	0.67	0.35	0.34	1.54
HHI	791	1067	180	4150	794	780	0.45
leverage	0.73	0.10	0.56	0.95	0.73	0.75	-6.10***
Institutional Shareholding %	7.66	9.43	0.01	31.51	7.71	7.45	0.89
Independent directors (%)	0.27	0.16	0	0.45	0.28	0.25	5.81***
Diversification	0.23	0.42	0	1	0.24	0.20	3.48***
Tobin q	1.49	1.51	0	6.06	1.47	1.56	-2.10**
ln (assets)	7.56	1.63	4.78	10.65	7.58	7.50	1.56
ln(firm age)	3.59	0.39	3.04	4.41	3.60	3.55	4.32***
Sales growth rate	11.36	24.56	-39	65.42	11.53	10.73	1.10
σ(CFO)	0.07	0.48	0.01	0.20	0.077	0.081	-0.86
σ(ROA)*100	0.006	0.009	0	0.03	0.006	0.007	-3.75***
σ (Stock returns)	39.95	53.78	0.97	206.54	38.78	44.56	-3.61***
Family shareholding	42.34	24.90	0	74.85	53.40	0	NA

Table II: Correlation Matrix

This table presents the correlation between key variables used in our analysis. Family dummy is a dummy variable set equal to 1 if the firm is owned by a family. *, **, *** represent significance at the 5%, 1%, and 0.1% levels, respectively, in the Student's t-tests.

Variables	Family dummy	ROA	M/B	Firm size	Firm age	Tangibility	HHI	leverage	Sales grth rate	% of independent directors	Diversification	σ(CFO)	σ(ROA)	σ (S. return)	Family Shareholding
Family dummy	1.000														
ROA	0.012	1.000													
M/B	0.011	0.030**	1.000												
Firm size	0.016	-0.021*	0.062***	1.000											
Firm age	0.046***	0.005	-0.005	0.226***	1.000										
Tangibility	0.019*	0.072***	-0.017	-0.030***	-0.017	1.000									
HHI	0.024**	-0.021*	-0.028**	-0.065***	-0.080***	-0.062***	1.000								
Leverage	-0.018	-0.062***	-0.006	0.015	0.003	-0.005	-0.013	1.000							
Sales growth rate	-0.001	0.013	-0.007	0.001	0.002	0.026**	0.001	-0.009	1.000						
% of independent direc.	0.051***	0.019	0.005	0.057***	0.017	0.019*	-0.036***	-0.014	0.015	1.000					
Diversification	0.040***	-0.048***	-0.004	0.041***	0.018	-0.022*	0.118***	-0.011	-0.003	-0.050***	1.000				
σ(CFO)	-0.010	0.009	-0.013	-0.132***	-0.074***	-0.057***	0.023*	-0.005	-0.027**	-0.005	0.023*	1.000			
σ(ROA)	-0.067***	0.297***	-0.004	-0.206***	-0.023*	-0.018	0.015	0.027**	0.001	-0.024***	-0.015	0.112***	1.000		
Family Shareholding	0.860***	0.026**	0.023*	-0.007	0.043***	0.001	0.020*	-0.021*	0.011	0.056***	0.026**	0.005	-0.065***	0.010	1.000

Table III: Panel Regressions of Volatility of Stock Returns

This table presents the results of panel regressions. The dependent variable is the standard deviation of annualized monthly stock returns measured over rolling windows of 5 years from 2001-2015 (i.e. 2001-2005, 2002-2006, 2003-2007 and so on). Independent variables are measured at the end of first year of each window. All the variables are defined in Appendix A. The regressions include industry and time fixed effects. The t-values have been reported in the parenthesis and standard errors are clustered at the firm level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Family Dummy	-13.803				
	(-1.260)				
Family Shareholding		-1.443***			
		(-2.654)			
Sq. of family shareholding		0.023***			
		(3.108)			
Family CEO			-37.122***		
			(-4.074)		
Family CEO*Business caste				30.692***	
				(3.092)	
Family CEO * Old Business family					-36.883***
					(-3.425)
Ln (Firm age)	-20.844*	-22.635**	-17.586	-13.284	-15.464
	(-1.919)	(-2.085)	(-1.619)	(-1.238)	(-1.409)
ln (Assets)	9.432***	8.614**	9.527***	9.897***	9.559***
	(2.672)	(2.435)	(2.706)	(2.839)	(2.712)
Leverage	-14.333	-12.611	-11.797	-10.892	-12.291
	(-0.664)	(-0.584)	(-0.549)	(-0.522)	(-0.572)
ROA	27.172	25.156	26.626	-8.154	27.941
	(0.626)	(0.580)	(0.615)	(-0.193)	(0.645)
Low HHI	18.158	20.650*	18.868	11.842	17.465
	(1.482)	(1.682)	(1.544)	(0.963)	(1.429)
High M/B	-9.125	-10.832	-8.182	-12.737	-8.315
	(-0.971)	(-1.151)	(-0.872)	(-1.367)	(-0.886)
Sales growth rate	-0.023	-0.026	-0.018	-0.016	-0.018
	(-0.297)	(-0.332)	(-0.231)	(-0.205)	(-0.236)
Institutional shareholding %	-0.492	-0.065	-0.363	-0.280	-0.403
	(-0.956)	(-0.121)	(-0.706)	(-0.551)	(-0.785)
Independent directors (%)	-6.576	-5.375	-13.480	-13.269	-8.079
	(-0.262)	(-0.214)	(-0.535)	(-0.529)	(-0.323)
Intercept	88.997*	90.992*	70.976	62.087	63.769
	(1.819)	(1.857)	(1.445)	(1.289)	(1.307)
Observations	3697	3693	3697	3477	3697
Adj. R-squared	0.004	0.007	0.009	0.006	0.007
Inflection Point		30.78%			

Table IV: Panel Regressions of Volatility of Cash Flows

This table presents the results of panel regressions. The dependent variable is the standard deviation of cash flow from operations scaled by total assets measured over rolling windows of 5 years from 2001-2015 (i.e. 2001-2005, 2002-2006 and so on). Control variables are measured at the end of first year of each window. The regressions include industry and time fixed effects. All the variables are defined in Appendix A. The t-values have been reported in the parenthesis and standard errors are clustered at the firm level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Family Dummy	-0.012***				
	(-5.037)				
Family Shareholding		-0.001***			
		(-4.370)			
Founder CEO			-0.010***		
			(-5.340)		
Family CEO * Business caste				-0.004**	
				(-2.249)	
Family CEO * Old Business					-0.017**
					(-2.178)
Ln (Firm age)	-0.006***	-0.007***	-0.007***	-0.007***	-0.007***
	(-2.808)	(-2.952)	(-3.262)	(-2.946)	(-3.258)
Ln (Assets)	-0.005***	-0.005***	-0.005***	-0.005***	-0.005***
	(-6.774)	(-6.862)	(-6.844)	(-6.370)	(-6.905)
Leverage	0.012**	0.012**	0.012***	0.014***	0.014***
	(2.497)	(2.555)	(2.582)	(2.968)	(2.971)
ROA	0.010	0.010	0.009	0.010	0.010
	(1.036)	(1.033)	(0.950)	(1.123)	(1.117)
Low HHI	-0.012***	-0.011***	-0.012***	-0.013***	-0.013***
	(-4.385)	(-4.268)	(-4.477)	(-4.724)	(-4.751)
High M/B	0.007***	0.007***	0.007***	0.006***	0.007***
	(3.541)	(3.435)	(3.756)	(3.020)	(3.469)
Sales growth rate	0.000*	0.000*	0.000*	0.000*	0.000**
	(1.936)	(1.915)	(1.916)	(1.814)	(1.968)
Inst. Shareholdings	-0.000*	-0.000	-0.000*	-0.000*	-0.000
	(-1.906)	(-1.560)	(-1.849)	(-1.788)	(-1.612)
Independent directors (%)	0.003	0.003	0.004	-0.001	0.001
	(0.528)	(0.547)	(0.789)	(-0.211)	(0.278)
Intercept	0.140***	0.141***	0.143***	0.134***	0.135***
	(13.566)	(13.573)	(13.755)	(12.645)	(13.120)
Observations	4111	4106	4111	3870	4111
Adj. R-squared	0.043	0.042	0.046	0.037	0.038

Table V: Panel Regressions of Volatility of Earnings

This table presents the results of panel regressions. The dependent variable is the standard deviation of ROA multiplied by 100 measured over rolling windows of 5 years from 2001-2015 (i.e. 2001-2005, 2002-2006 and so on). Explanatory variables are measured at the end of first year of each window. The regressions include industry and time fixed effects. All the variables are defined in Appendix A. The t-values have been reported in the parenthesis and standard errors are clustered at the firm level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Family dummy	-0.011***					
	(-3.969)					
Family Shareholding		-0.000***	-0.000***			
		(-2.752)	(-3.445)			
Sq. Family Shareholding			0.000***			
			(2.684)			
Family CEO				-0.006**		
				(-2.523)		
Founder*Business caste					-0.003	
					(-1.170)	
Founder* Old business						0.063***
						(7.068)
Ln (firm age)	0.001	0.000	0.000	-0.001	-0.000	0.001
	(0.188)	(0.089)	(0.076)	(-0.267)	(-0.079)	(0.265)
Ln (Assets)	-0.011***	-0.011***	-0.011***	-0.011***	-0.012***	-0.011***
	(-13.575)	(-13.459)	(-13.612)	(-13.617)	(-13.271)	(-13.537)
Leverage	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***
	(4.778)	(4.826)	(4.792)	(4.873)	(4.800)	(4.980)
Low HHI	0.000	-0.000	0.000	-0.000	-0.001	0.001
	(0.001)	(-0.129)	(0.081)	(-0.142)	(-0.376)	(0.387)
High M/B	-0.003	-0.003	-0.004	-0.003	-0.004	-0.004*
	(-1.484)	(-1.413)	(-1.563)	(-1.477)	(-1.605)	(-1.684)
Sales growth rate	-0.000	0.000	-0.000	-0.000	0.000	0.000
	(-0.005)	(0.011)	(-0.021)	(-0.020)	(0.044)	(0.001)
Inst. Shareholding	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(7.699)	(7.242)	(7.645)	(7.683)	(7.596)	(7.537)
Independent directors %	-0.003	-0.004	-0.003	-0.003	-0.005	-0.006
	(-0.545)	(-0.660)	(-0.536)	(-0.501)	(-0.711)	(-1.027)
Intercept	0.094***	0.092***	0.095***	0.094***	0.094***	0.084***
	(8.334)	(8.149)	(8.360)	(8.237)	(7.864)	(7.445)
Observations	4198	4193	4193	4198	3956	4198
Adj. R-squared	0.055	0.053	0.055	0.053	0.052	0.063
Inflection point			47%			

Table VI: Instrumental Variables Regression

This table reports results of instrumental-variable, two-stage least square regressions of the impact of (predicted value of) family ownership on risk taking. *Predicted value of family ownership* is the predicted value obtained by regressing family ownership on the *natural lag of total assets*, the *square of the natural log of total assets* and *Beta.* For a detailed description of the independent variables please refer to Appendix A. The t-values have been reported in the parenthesis and standard errors are clustered at the firm level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Predicted value of Family Shareholding	-31.883**		
	(-2.131)		
Sq. of Family Shareholding	0.414**		
	(2.157)		
Ln (Firm age)	-12.203		
	(-0.774)		
leverage	-82.083*		
	(-1.778)		
ROA	36.327		
	(0.610)		
Low HHI	79.082**		
	(2.451)		
High M/B	-23.345		
	(-1.546)		
Sales growth rate	0.002		
	(0.020)		
Institutional Shareholdings	4.017**		
	(2.285)		
Independent directors (%)	81.321		
	(1.520)		
Intercept	418.640***		
	(2.788)		
Observations	3693		
Wald Chi-Square	10.36		
Inflection Point	38.49%	.	.

Table VII: Propensity Score Matching using Nearest Neighbor Matching with Replacement

In this table we identify a control sample of firms that are not family firms by employing a propensity score matching procedure. The propensity score is estimated using all firm characteristics included in our regression analyses. We require that the difference between the propensity score of the firm belong to a business family or run by a family member and its matching peer does not exceed 0.2% in absolute value. We then compare the levels of volatilities of stock return, cash flow and ROA between the two groups. Variables are defined in Appendix A.

Panel A: Stock Return Volatility

	N	Mean %	Difference %	t-statistic
σ (Stock returns) Family Firms	3249	71.67	-12.20	-0.77
σ (Stock returns) Non Family Firms		83.87		
σ (Stock returns) Family-CEO *Old Business Family	182	76.03	-14.26	-0.42
σ (Stock returns) control sample		90.30		
σ (Stock returns) Family-CEO*Business caste	2,039	68.63	7.20	0.68
σ (Stock returns) Control sample		61.44		

Panel B: Cash Flow Volatility

	N	Mean %	Difference %	t-statistic difference
σ(CFO) Family Firms	3,261	0.069	-0.0122	-3.29***
σ(CFO) Non Family Firms			0.081	
σ(CFO) Family-CEO	3,065	0.069	-0.0162	-4.78***
σ(CFO) Non family-CEO			0.085	

Panel C: ROA Volatility

	N	Mean %	Difference %	t-statistic difference
σ(ROA)*100 Family Firms	3,328	0.008	-0.009	-1.40
σ(ROA)*100 Non Family Firms			0.017	
σ(ROA)*100 Family-CEO	3,128	0.008	-0.005	-0.84
σ(ROA)*100 Non family-CEO			0.013	
σ(ROA)*100 Family-CEO *Old Business Family	1,476	0.017	0.001	-0.27
σ(ROA)*100 Family-CEO * Control Sample			0.012	

Table VIII: Panel Regressions of Volatility of Stock Returns with Firm Fixed effects

This table presents the results of panel regressions. The dependent variable is the standard deviation of annualized monthly stock returns measured over rolling windows of 5 years from 2001-2015 (i.e. 2001-2005, 2002-2006 and so on). Explanatory variables are measured at the end of first year of each window. The regressions include firm and time fixed effects. All the variables are defined in Appendix A. The t-values have been reported in the parenthesis and standard errors are clustered at the firm level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Family Dummy	-16.999			
	(-0.705)			
Family CEO		-34.228*		
		(-1.730)		
Founder*Business caste			71.456***	
			(3.495)	
Family CEO*Old Business				-41.975*
				(-1.705)
Independent directors (%)	-3.004	-7.592	2.845	-4.966
	(-0.055)	(-0.139)	(0.045)	(-0.091)
Ln (Firm age)	-18.090	-15.624	-16.916	-13.889
	(-0.752)	(-0.649)	(-0.624)	(-0.569)
Ln (Assets)	-1.670	-1.670	-6.342	0.092
	(-0.253)	(-0.253)	(-0.962)	(0.014)
Leverage	7.859	7.859	7.681	7.932
	(0.431)	(0.431)	(0.434)	(0.435)
ROA	-3.598	-3.598	2.943	-1.953
	(-0.108)	(-0.108)	(0.091)	(-0.059)
Low HHI	-22.322	-22.322	-24.714	-23.355
	(-0.815)	(-0.815)	(-0.908)	(-0.852)
High M/B	1.529	1.529	0.175	1.673
	(0.201)	(0.201)	(0.023)	(0.220)
Sales Growth rate	0.015	0.015	0.011	0.014
	(0.269)	(0.269)	(0.197)	(0.253)
Institutional Shareholding	0.206	0.206	0.211	0.210
	(0.367)	(0.367)	(0.380)	(0.374)
Intercept	75.352	59.312	59.324	49.360
	(0.641)	(0.503)	(0.449)	(0.422)
Observations	3697	3697	3477	3697
Log-likelihood	2.493e+04	2.493e+04	2.339e+04	2.493e+04
Chi-square	6.6071	9.3414	20.0634	10.4937

Table IX: Panel Regressions of Volatility of Cash Flows with Firm Fixed effects

This table presents the results of panel regressions. The dependent variable is the standard deviation of cash flow from operations scaled by total assets measured over rolling windows of 5 years from 2001-2015 (i.e. 2001-2005, 2002-2006 and so on). Independent variables are measured at the end of first year of each window. The regressions include firm and time fixed effects. All the variables are defined in Appendix A. The t-values have been reported in the parenthesis and standard errors are clustered at the firm level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Family dummy	-0.010*			
	(-1.729)			
Family CEO		-0.009**		
		(-2.002)		
Family CEO *Business caste			-0.002	
			(-0.348)	
Founder*Old business family				-0.027
				(-1.421)
Independent directors (%)	0.004	0.005	-0.001	0.003
	(0.271)	(0.375)	(-0.064)	(0.199)
ln(firm age)	-0.007	-0.008	-0.007	-0.008
	(-1.228)	(-1.373)	(-1.145)	(-1.407)
ln(Assets)	-0.004***	-0.004***	-0.004***	-0.004***
	(-3.023)	(-3.023)	(-3.153)	(-3.023)
Leverage	-0.012***	-0.012***	-0.011***	-0.012***
	(-3.011)	(-3.011)	(-2.898)	(-3.011)
ROA	-0.020***	-0.020***	-0.020***	-0.020***
	(-2.897)	(-2.898)	(-2.940)	(-2.897)
Low HHI	-0.021***	-0.021***	-0.014***	-0.021***
	(-4.031)	(-4.031)	(-2.712)	(-4.031)
High M/B	0.006***	0.006***	0.006***	0.006***
	(4.163)	(4.163)	(4.022)	(4.163)
Sales growth rate	0.000***	0.000***	0.000***	0.000***
	(4.433)	(4.433)	(4.370)	(4.433)
Inst. Shareholdings	-0.000***	-0.000***	-0.000***	-0.000***
	(-3.383)	(-3.383)	(-3.310)	(-3.383)
Intercept	0.099***	0.102***	0.089***	0.093***
	(3.570)	(3.685)	(3.122)	(3.381)
Observations	4111	4111	3870	4111
Log-likelihood	6928.4400	6930.1348	6534.2418	6927.9578
Chi-square	131.1140	134.7896	116.7237	130.0646

Table X: Panel Regressions of Volatility of Earnings with Firm Fixed effects

This table presents the results of panel regressions. The dependent variable is the standard deviation of ROA multiplied by 100 measured over rolling windows of 5 years from 2001-2015 (i.e. 2001-2005, 2002-2006 and so on). Independent variables are measured at the end of first year of each window. The regressions include firm and time fixed effects. All the variables are defined in Appendix A. The t-values have been reported in the parenthesis. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Family dummy	-0.024***				
	(-5.020)				
Family Shareholding		0.001***			
		(2.667)			
Family CEO			-0.010***		
			(-2.952)		
Family CEO.*Business caste				-0.002	
				(-0.249)	
Family CEO *Old business					0.055***
					(4.405)
Independent directors %	0.005	0.003	0.001	0.002	-0.002
	(0.532)	(0.274)	(0.064)	(0.187)	(-0.223)
Ln (firm age)	0.004	0.004	0.003	0.003	0.003
	(1.030)	(0.878)	(0.783)	(0.656)	(0.678)
Ln (Assets)	-0.010***	-0.011***	-0.010***	-0.011***	-0.010***
	(-5.025)	(-5.094)	(-4.981)	(-4.912)	(-4.950)
Leverage	0.005***	0.005***	0.005***	0.005***	0.005***
	(2.762)	(2.741)	(2.738)	(2.658)	(2.721)
Low HHI	-0.002	-0.002	-0.002	-0.001	-0.002
	(-0.240)	(-0.285)	(-0.238)	(-0.154)	(-0.236)
High M/B	-0.002	-0.002	-0.002	-0.002	-0.002
	(-0.716)	(-0.822)	(-0.709)	(-0.734)	(-0.705)
Sales growth rate	0.000	0.000	0.000	0.000	0.000
	(0.061)	(0.103)	(0.060)	(0.059)	(0.060)
Institutional Shareholdings	0.001***	0.001***	0.001***	0.001***	0.001***
	(2.931)	(3.465)	(2.905)	(2.899)	(2.887)
Intercept	0.105***	0.098***	0.092***	0.098***	0.086***
	(5.571)	(5.430)	(5.181)	(5.198)	(5.100)
Observations	4198	4193	4198	3956	4198
Log-likelihood	5279.7379	5266.6277	5268.6528	4849.2335	5273.2192
Chi-square	174.9574	193.7575	188.5071	179.6854	218.8785

Table XI: Family Ownership, Corporate Diversification and Leverage

This table reports the results of OLS regression. The dependent variable is the natural log of number of business segments. The regression include industry fixed effects. All the variables are defined in Appendix A. The t-values have been reported in the parenthesis. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

	ln (Number of business segments)	Leverage	
Family Shareholding	-0.002*	-0.001***	
	(-1.786)	(-3.792)	
Sq. of Family Shareholding	0.000**	0.000**	
	(2.361)	(2.156)	
Founder CEO			-0.026***
			(-4.033)
Ln (Firm age)	0.095***	0.006	0.002
	(4.836)	(0.722)	(0.240)
Ln (Total Assets)	0.062***	0.011***	0.010***
	(8.835)	(4.410)	(4.288)
Leverage	-0.086		
	(-1.030)		
Diversification dummy		-0.004	-0.004
		(-0.565)	(-0.542)
ROA	-0.250**	-0.283***	-0.288***
	(-2.473)	(-9.244)	(-9.418)
Low HHI	-0.030	0.021**	0.020**
	(-1.343)	(2.374)	(2.211)
High M/B	0.014	0.005	0.006
	(0.791)	(0.834)	(0.850)
Sales growth rate	-0.000	-0.000	-0.000
	(-0.591)	(-0.236)	(-0.250)
Inst. Shareholding %	0.000	-0.001***	-0.001***
	(0.201)	(-3.075)	(-2.863)
Independent directors (%)	0.080	0.010	0.011
	(1.635)	(0.568)	(0.641)
Intercept	0.146	0.695***	0.694***
	(1.385)	(21.054)	(20.939)
Observations	1585	4112	4117
Adj. R-squared	0.104	0.036	0.033
Inflection point	27.04%	64.44%	

Table XII: Nonlinear Relation Between Cash Flow Volatility and Family ownership

This table reports the results of panel regression. The dependent variable is the standard deviation of cash flow from operations scaled by total assets measured over rolling windows of 5 years from 2001-2015 (i.e. 2001-2005, 2002-2006 and so on). Control variables are measured at the end of the first year of each window. The regression include industry and time fixed effects. All the variables are defined in Appendix A. The t-values have been reported in the parenthesis. The asterisk superscripts ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Family Shareholding	-0.001***
	(-4.37)
Sq. of Family Shareholding	0.000***
	(3.40)
ln (firm age)	-0.007***
	(-2.952)
ln (Total Assets)	-0.005***
	(-6.862)
Leverage	0.012**
	(2.555)
ROA	0.01
	(1.033)
Low HHI	-0.011***
	(-4.268)
High M/B	0.007***
	(3.435)
Sales Growth Rate	0.000*
	(1.915)
Institutional shareholding	0.000
	(1.560)
Independent directors (%)	0.003
	(0.547)
Intercept	0.141***
	(13.573)
Observations	4106
Adjusted R-Squared	0.042
Inflection Point	47.07%

Table XIII: Determinants of Cash Holdings

This table reports the results of pooled cross sectional panel regression. The dependent variable is the natural log of the ratio of cash to assets minus cash measured from 2001-2015. The regressions include industry and time fixed effects. All the variables are defined in Appendix A. The t-values have been reported in the parenthesis. The asterisk superscripts ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

Family Shareholding	0.006***		
	(3.069)		
Sq (Family Shareholdings)	-0.000***		
	(-3.053)		
Family dummy		0.059	
		(1.471)	
Old business family			0.066*
			(1.939)
M/B ratio	0.001	0.001	0.001
	(0.649)	(0.588)	(0.590)
Ln (Assets)	-0.097***	-0.096***	-0.097***
	(-9.085)	(-8.982)	(-9.115)
R&D/Sales	-0.567	-0.664	-0.571
	(-0.651)	(-0.763)	(-0.657)
Cash flow/Assets	0.362***	0.363***	0.361***
	(5.184)	(5.197)	(5.174)
NWC/Assets	-0.276***	-0.270***	-0.267***
	(-5.324)	(-5.217)	(-5.167)
Capex/Assets	-0.206**	-0.208**	-0.203**
	(-2.421)	(-2.449)	(-2.390)
Leverage/Total Assets	2.665***	2.697***	2.647***
	(3.452)	(3.495)	(3.429)
Industry sigma	0.002***	0.002***	0.002***
	(4.744)	(4.683)	(4.654)
Dividend dummy	0.500***	0.489***	0.491***
	(13.458)	(13.252)	(13.339)
Intercept	-4.391***	-4.385***	-4.346***
	(-21.481)	(-21.423)	(-21.506)
Observations	6835	6858	6858
Adj. R-squared	0.107	0.105	0.105
Time Fixed Effects	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes
Inflection point	56%		