Idiosyncratic Risk, Information Flow, and Earnings Informativeness for Family Businesses

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Saskatoon, Saskatchewan, Canada

By

Lei Zhao

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Abstract

Many previous studies find that family firms are prevalent among the U.S. firms. In particular, more than 35 percent of the S&P 500 firms consist of family firms in which families control about 18 percent of their firms' shares. According to agency theory, the characteristics of a firm's ownership, governance, and control play a critical role in the firm's risk-taking activities and information flow to the market. Our study aims to investigate two controversies in the family business literature: whether family firms undertake fewer or more risks than non-family firms do, and whether family firms exhibit higher or lower information flow, reflected in their stock price informativeness and earnings informativeness, to the market. Using a sample of the S&P 500 companies as of 2003 for the period 2003-2007, we find that compared with non-family firms, the stock prices of family firms have more firm specific information impounded and the accounting earnings of family firms are more informative and thereby have more explanatory power for stock returns. These results are robust to different model specifications and variable proxies. In terms of risk-taking levels in corporate investment, our results indicate that family firms, on average, undertake fewer risks than non-family firms do. In particular, we find that although G-index is negatively associated with corporate risk-taking in non-family firms as previous studies (e.g. John et al., 2008) find for general firms, governance provisions do not have any influence on corporate risk-taking decisions in family firms. Numerous additional sensitivity tests using different corporate risk-taking proxies confirm the robustness of the findings.

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1. Introduction

*"*Surprise! One-third of the S&P 500 companies have founding families involved in management. And those are usually the best performers*"* (Business Week, 2003, p. 1). Conventionally, dispersed ownership, fragmented shareholders, and a separation between ownership and control are deemed as the typical features of large U.S. public firms (Demsetz and Lehn, 1985). However, during the past decades, especially since 2003, many studies, including Shleifer and Vishny (1986), Anderson and Reeb (2003a; 2003b; 2004), Business Week (2003), and Chen et al. (2008) etc.,[1] have found that firms with concentrated family ownership and powerful family control are quite prevalent among U.S. public firms, thereby making family firms a promising area of research in the corporate finance literature.

Family firms are distinct from non-family firms in terms of different perspectives. First, there exist families who are in large undiversified equity positions in the firms (Anderson and Reeb, 2003b). Second, due to family firms' long-run sustainability across generations, firm survival and succession issues constitute two of the major concerns for current family members to consider when making corporate decisions, which in turn leads family firms to focus on long-term investment and business horizons (as opposed to managerial myopia commonly observed in non-family firms) (Stein, 1988; Stein, 1989; James 1999; Anderson and Reeb, 2003a). Third, unlike the free-rider problem typically existing in non-family firms without concentrated ownership, families have both the incentives and the ability to oversee and discipline managers, and families are normally involved in senior management positions (acting as owner-managers) and board seats in their firms, both of which make family firms face less severe principal-agent agency problems than non-family firms (Anderson and Reeb, 2003a; Ali

[1] Different from Anderson and Reeb (2003a; 2003b; 2004) and Business Week (2003) whose identifications of family firms are based on S&P 500 firms, Chen et al. (2008) additionally include S&P MidCap 400 firms and S&P SmallCap 600 firms (i.e. S&P 1500 index firms) and find that family firms constitute approximately 46% of the S&P 1500 index firms.

et al., 2007). Fourth, other than accomplishing firm-oriented goals (e.g. maximizing shareholder wealth), families may have the propensity to pursue family-oriented noneconomic goals (e.g. preserving social-emotional wealth) which may only benefit families themselves rather than increasing shareholder wealth (Chrisman et al., 2003; Gomez-Mejia et al., 2007; Chrisman et al., 2010; Gomez-Mejia et al., 2010).

Although empirical studies on the difference in firm performance between family and non-family firms have been extensively conducted, little attention has been given to family firms' risk-taking propensity relative to that of non-family firms. According to agency theory, the characteristics of a firm's ownership structure and governance mechanisms play a critical role in the firm's risk-taking activities (Jensen and Meckling, 1976; Fama, 1980; Fama and Jensen, 1983). As it has generally been accepted that family firms differ from non-family firms in terms of organizational and governance structures, the risk-taking levels in these two distinct corporate contexts are supposed to be different. However, despite the priori concept that family firms are consistently involved in risk-reducing activities (Anderson and Reeb, 2003b), "whether family firms take risks to the same extent as nonfamily firms is controversial" (Naldi et al., 2007, p. 36). For instance, theoretically, Fama and Jensen (1983) suggest that family firms are usually more risk averse and thereby undertake less risky investments than non-family firms do, whereas Zahra (2005) notes that family ownership and involvement actually promote risk-taking activities. Empirically, Anderson and Reeb (2003b), which to the best of our knowledge is the only study in the family business literature that empirically investigates family firms' risk levels compared with those of non-family firms, find no significant differences in direct measures of equity risk (i.e. total risk, systematic risk, and firm-specific risk) between family and non-family firms. However, Anderson and Reeb's (2003b) findings are contrary to the authors' prior argument and expectation that due to their survival concern and their large undiversified equity position, families have substantial incentives to minimize firm risk.

Like corporate insiders (i.e. controlling shareholders and managers) in any category of firms,

families face two aspects of risks: business risk that arises from the fluctuation in a firm's performance (e.g. volatility of corporate earnings), and equity risk that arises from the variation in a firm's stock price. In particular, both of these two types of risks a firm confronts could be closely associated with the overall quality of the firm and its corporate governance (Gompers et al. 2003; Cremers and Nair, 2005; Zahra 2005; John et al., 2008). In our study, by using volatility of corporate earnings to proxy for corporate risk-taking, we empirically examine whether family firms undertake fewer or more risks than non-family firms do. With respect to equity risk, we focus on the firm-specific portion of it, namely idiosyncratic risk (or idiosyncratic volatility), which is generated by firm-specific components such as "the success of new product innovations, cost-cutting efforts, a fire at a manufacturing plant, the discovery of an illegal corporate act, a management change, and so forth" (Grinblatt and Titman, 2002, p. 176). In the literature, there is another school of interpretation about idiosyncratic volatility. Previous studies unanimously suggest that idiosyncratic volatility is an ideal measure of stock price informativeness. Therefore, by looking into idiosyncratic volatility in family and non-family firms, our study could alternatively suggest whether the stock prices of family firms have more or less firm specific information impounded than those of non-family firms.

Regarding information flow for family firms, besides stock price informativeness, we also investigate whether family firms have higher or lower earnings informativeness (a different aspect of information flow) than non-family firms, on which there is no agreement in the literature. Theoretically, there are two competing arguments: *the entrenchment argument* which suggests that families' significant stock ownership, active involvement and control in board seats, and dominant occupation in senior management positions would create incentives for family members to manipulate accounting earnings to exploit private benefits; *the alignment argument* which suggests that family firms' long-run sustainability across generations and families' effective monitoring, reputation concern, and especially stewardship tendency would lead family firms to report earnings in good faith (Wang, 2006). Empirically, Wang (2006) and Ali et al.

(2007) report that the accounting earnings of family firms are more informative than those of non-family firms, whereas Ding et al. (2011) find the opposite result. In our study, we continue to empirically investigate this controversy.

Using a sample of the S&P 500 companies as of 2003 for the period 2003-2007, we find that, compared with non-family firms, family firms have higher idiosyncratic risk, or alternatively, family firms have higher stock price informativeness. Similarly, consistent with Wang (2006) and Ali et al. (2007), we find that the earnings of family firms are more informative than those of non-family firms. With regard to the degree of risk-taking in corporate operations, our results indicate that family firms undertake fewer risks than non-family firms do. Particularly, we find that governance provisions do not have any influence on corporate risk-taking decisions in family firms, whereas non-family firms with fewer (more) antitakeover provisions undertake more (fewer) risks, a result that is consistent with John et al.'s (2008) findings.

The rest of this paper is structured as follows. Section 2 reviews the previous relevant literature and develops our research questions. Our sample, variable measures, and research design are described in Section 3. The empirical results are presented and discussed in Section 4. Section 5 examines the robustness of the results. Section 6 concludes the paper.

2. Literature Review

2.1 Definitions of Family Business

What is the essence (or the unique feature) that characterizes a firm as a family business? Conceptually and intuitively, the commonly accepted distinctive feature of a family business is family involvement in the firm. Previous studies define family involvement based on a combination of ownership, management, governance, and succession (Handler, 1989; Churchill and Hatten, 1987). Chua et al. (1999) document that the four components of family involvement

are widely used as the basis for the operational definition for family business.[2]

By looking into more than 250 articles in the family business literature, Chua et al. (1999) summarize a list of 21 definitions based on family involvement, mainly in terms of management and ownership.[3] As Chua et al. (1999) find out, those 21 definitions for family business can be generally enumerated as a combination of two factors, ownership and management: (i) family owned and family managed; (ii) family owned but not family managed; and (iii) family managed but not family owned.

Many identifications of family firms in the recent and classical family business literature are based on family involvement (i.e. family ownership and family management).[4] For instance, Business Week (2003) defines family firms as "those in which the founders or their families maintain a presence in senior management, on the board, or as significant shareholders" (Business Week, 2003, p. 1).[5] We can notice from this definition that the wording *or* is used, indicating that family firms are identified as long as any one of these three criteria is met. Anderson and Reeb (2003a; 2003b; 2004) define family firms as "firms where the family continues to have an equity ownership stake or board seats" (Anderson and Reeb, 2003a, p. 1312). Obviously, different from Business Week's (2003) definition, Anderson and Reeb do not include family involvement in management as a criterion to define family business. Again, *or* is used to connect the two different criteria, suggesting that either one of them or both is sufficient to identify family firms. Gomez-Mejia et al. (2003) follow two conditions to identify family firms: (i) "two or more directors had a family relationship"; *and* (ii) "family members owned or controlled at least 5 percent of the voting stocks" (Gomez-Mejia et al., 2003, p. 230).

[2] *"*An operational definition identifies the observable and measurable characteristics that differentiate the entity, object, or phenomenon from others.*"* (Chua et al., 1999, p. 23)

[3] For more details about the 21 definitions, please refer to Chua et al. (1999) on page 21.

[4] Kelly et al. (2000) and Sundaramurthy and Kreiner (2008) suggest that family involvement, particularly in the forms of ownership and management, would facilitate families to control their firms and exert significant influences on their firms' decision making, strategy formulation, and daily operations.

[5] The definition of family firms followed by Business Week (2003) has been widely adopted among empirical research on family business (Ali et al., 2007, p. 246, footnote #9).

Gomez-Mejia et al.'s (2003) definition is much more restrictive than the former two. First, *and* is used between the two conditions, indicating that both of them should be simultaneously met to qualify as family firms. Second, the two conditions are more specific—i.e. 5 percent is set up as a minimum requirement for family ownership and at least two directors are stipulated for family involvement and control in board seats, whereas the former two definitions introduced do not have such detailed quantity requirements.

When different definitions are used to identify family firms in different studies, it may be difficult to reconcile research results from these studies (Chua et al., 1999). In this case, our understanding of family business will be negatively impacted and especially no generalization can be established from these studies. In order to enrich and contribute to the literature on family business, in our study, we follow Business Week's (2003) definition, which is the most extensively used among empirical research on family business, to identify family firms.

2.2 Corporate Governance Characteristics in Family Firms

Generally, dispersed ownership, fragmented shareholders, and a separation between ownership and control are deemed as the typical features of large U.S. public firms (Demsetz and Lehn, 1985). However, Shleifer and Vishny (1986) point out that large shareholders are extensively observed among large public firms. Particularly, family presence, in terms of both large equity holding and dominant occupation on board seats, is observed in approximately one third of the Fortune 500 firms (Shleifer and Vishny, 1986). Other previous researchers also find the same phenomenon—family ownership and control are quite prevalent among U.S. firms. For instance, Anderson and Reeb (2003a) document that more than 35 percent of the S&P 500 firms consist of family firms in which families control about 18 percent of their firms' shares. Similarly, Business Week (2003) also finds that family presence (founders or their family members serving as directors or occupying senior management positions) appears in 177 firms of the S&P 500.

However, ironically, both journalistic accounts and previous literature indicate that family ownership and control in U.S. public firms are an inefficient and unprofitable organizational structure (Anderson and Reeb, 2003a). With such prior negative argument about family ownership and control, why is this kind of organizational form still quite common among U.S. firms? Next, we will examine the potential benefits and costs of family ownership and control respectively.

2.2.1 The Potential Benefits of Family Ownership and Control

Family ownership, as a special class of concentrated ownership, can provide potential benefits in terms of different perspectives. One major advantage generated from family ownership is the monitoring effect through which families have both the incentives and the ability to oversee and discipline managers (Anderson and Reeb, 2003a). This advantageous attribute of family ownership is consistent with Demsetz and Lehn's (1985) argument that large shareholders have great incentives to minimize agency problems (e.g. managerial expropriation) and maximize firm value. Moreover, Fama and Jensen (1983) demonstrate that family controlled firms bear less costs of monitoring, which makes family controlled firms more efficient than firms run by professional managers.

From the view of investment decisions, due to their long standing presence in the firms, families generally have longer investment horizons (Anderson and Reeb, 2003a). James (1999) suggests that such longer investment horizons in family firms can significantly improve investment efficiency. Although generally only diversified shareholders (as opposed to concentrated shareholders) potentially make investment decisions based on the market rule—maximizing the value of the firm's residual cash flows, James (1999) indicates that family ownership (as a special class of concentrated ownership) prompts family firms to follow the market rule to invest—another aspect, other than longer investment horizon, that contributes to greater investment efficiency in family firms. Consistent with Chua et al.'s (1999) theoretical

definition of family business,[6] Anderson and Reeb (2003a) demonstrate that the succession issue plays an important role in investment decisions in family firms. Specifically, one of the major tasks and objectives of current family members is to pass their firms to their next generations, leading to firm survival as a main concern for current family members to consider (Anderson and Reeb, 2003a). With firm survival concerns and their large undiversified equity position, families are "potentially long term value maximization advocates" (Anderson and Reeb, 2003a, p. 1306).

As Anderson and Reeb (2003a) suggest, family presence with a long-run horizon in a firm can potentially affect the relationship between the firm and external parties, such as suppliers and capital providers. Those external parties prefer to do business with relatively fixed governance entities such as family firms rather than with other entities in which turn-over is more frequent (Anderson and Reeb, 2003a). One example introduced by Anderson et al. (2003) about the benefits of families' long standing presence is that family firms bear lower cost of debt financing than non-family firms. In order to preserve such an advantageous relationship with external parties, reputation constitutes another concern for family firms, suggesting that families have strong incentives to refrain from taking actions that are detrimental to the firm and to the firm's reputation. Furthermore, according to the steward theory proposed by Davis et al. (1997), family members deem their firms as assets that are closely tied to themselves, associate their firms' health with their own well-being, and function as stewards of their firms, all of which alternatively explain the reputation concern of family firms. In addition, consistent with Davis et al.'s (1997) steward theory, Steier (2003) notes that family members, usually as owner-managers, function as stewards of their firms' resources and thereby distribute them on the basis and aim of generating value and wealth.

[6] *"*The family business is a business governed and/or managed with the intention to shape and pursue the vision of the business held by a dominant coalition controlled by members of the same family or a small number of families in a manner that is potentially sustainable across generations of the family or families.*"* (Chua et al., 1999, p. 25)

2.2.2 The Potential Costs of Family Ownership and Control

Like any class of large shareholders, families have both the incentives and the power to expropriate private benefits both from their firms and from minority shareholders (Demsetz, 1983; Demsetz and Lehn, 1985; Shleifer and Vishny, 1997; Faccio et al., 2001). DeAngelo and DeAngelo (2000) document that such private benefits can be collected by families through excessive compensation, related-party transactions, and special dividends.

One major issue arising from family ownership and control is managerial entrenchment. Gomez-Mejia et al. (2001) find that this issue is widely observed in family firms, leading to poor decision making especially under the situation that family firms are owned and managed by descendants (Burkart et al., 2003). As Anderson and Reeb (2003a) suggest, families are in a uniquely advantageous position to appoint directors and managers, consequently deterring bidding by third parties and thus making their firms more insulated from takeovers and from the market for corporate control. Managerial entrenchment in family firms can also result in other side effects. Schulze et al. (2001) note that incompetent and unqualified family members who dominantly occupy senior management positions may stimulate resentment by non-family employees and executives, leading to negative impact on those non-family employees' motivation, effort, and productivity (Burkart et al., 1997). In addition, restricting senior management positions to incompetent and unqualified family members may place family firms at a competitive disadvantage compared with non-family firms.

Another major cost resulting from family ownership and control is risk aversion and avoidance (Anderson and Reeb, 2003b). Anderson and Reeb (2003b) suggest that due to their survival concern and their large undiversified equity position, families have substantial incentives to minimize firm risk. An alternative explanation for family firms' risk avoidance is, once again, related to the succession issue. Burkart et al. (2003) state that "A crucial issue in the discussion of family firms from the perspective of corporate governance and finance is

succession" (Burkart et al., 2003, p. 2167). This crucial issue makes passing their firms to their next generations a major concern for current family members. According to Anderson and Reeb's (2003b) study, two ways can be used by families to mitigate firm risk: diversification and low-default capital forms (e.g. equity financing). Specifically, for diversification, although it is an effective strategy for family firms to realize their objective of minimizing firm risk, it can cause substantial conflicts of interests with minority shareholders;[7] for low-default capital forms, family firms usually avoid using debt financing, which has relatively high probability of default, but instead rely more on equity financing. Both of these can bring substantial costs to diversified minority shareholders.[8]

In summary, families, as a special class of large shareholders, are in a large undiversified equity position, have a long standing investment horizon (as opposed to managerial myopia commonly observed in non-family firms (Stein, 1988; Stein, 1989)), view survival and the succession issue as one of their major concerns, and normally occupy senior management positions, all of which place families in a uniquely advantageous position to impose their distinctive corporate governance and control on their firms.

2.3 Control Enhancing Governance Provisions and Family Involvement

The adoption of control enhancing governance provisions is a critical component of corporate governance. As we previously introduced, family firms exhibit unique corporate governance characteristics. We thereby expect that family firms would accordingly demonstrate their particular propensity to use control enhancing governance provisions idiosyncratically.

On the one hand, in family firms, sustaining control status and enhancing powerful

[7] Allen and Panian (1982) show that families usually have and go after their own concerns and interests, which may conflict with those of the firm or other shareholders. Carly Fiorina, who used to be the CEO of Hewlett-Packard from 1999 to 2005, indicates that the interests of families, such as stability and capital preservation, may not align with the interests of minority shareholders (The Wall Street Journal, 2001).

[8] For diversification, many empirical studies suggest that it can bring negative impact on firm value. For instance, Martin and Sayrak (2003) argue that diversified firms do not have sufficient free cash flow allocated for potential investment opportunities, leading to investment inefficiency and thereby negatively affecting firm value.

influences constitute a major objective for families who act as controlling owners. Burkart et al. (2003) argue that in family firms, families would do their best to preserve family control on their firms. Likewise, Gedajlovic et al. (2004) suggest that families are usually unwilling to release family control on their firms to non-family entities, making families "hang on to the control too long from non-controlling shareholders' perspective" (Cronqvist and Nilsson, 2003, p. 697). In order to maintain their power and voice, families tend to use control enhancing governance provisions (e.g. unequal voting rights and cumulative voting) which can protect their control status by increasing their voting rights relative to their cash flow rights (Villalonga and Amit, 2006; Villalonga and Amit, 2008).[9] Another driver of families idiosyncratically utilizing control enhancing governance provisions arises from families' preference for pursuing and maximizing family-oriented noneconomic goals and benefits, including the establishment of a family dynasty, the maintenance of family reputation and prestige, and the build-up of social capital etc., all of which in turn enhance families' desire to sustain family influence and control by using control enhancing governance provisions (Chrisman et al., 2003; Gomez-Mejia et al., 2007; Berrone et al., 2010; Chrisman et al., 2010; Gomez-Mejia et al., 2010; Chrisman et al., 2012).

In family firms, controlling family owners usually designate family members to occupy senior management positions (Anderson and Reeb, 2003a; Morck and Steier, 2005). Even under the situation that controlling family owners are not directly involved in management due to their preference of solely being investors, they would instead influence management indirectly by nominating their favorite non-family managers and affiliated directors who are to represent

[9] "Unequal Voting rights limit the voting rights of some shareholders and expand those of others" (Gompers et al., 2003, p. 150). "Cumulative Voting allows a shareholder to allocate his total votes in any manner desired, where the total number of votes is the product of the number of shares owned and the number of directors to be elected"; cumulative voting can facilitate families to concentrate their votes to elect their favorite directors (Gompers et al., 2003, p. 147).

Villalonga and Amit (2008, p. 19) enumerate four examples to illustrate families' control rights in excess of their cash flow rights by using dual class shares: (i) Comcast Corporation of which in 2000, families held only 3.14% of the firm's shares but controlled 85.64% of the votes; (ii) Ford Motor Company of which in 1998, families held only 6% of the firm's shares but controlled 40% of the votes; (iii) Viacom Inc. of which in 2000, families held only 13.3% of the firm's shares but controlled 67.55% of the votes; and (iv) Tyson Foods, Inc. of which in 1998, families held only 45.41% of the firm's shares but controlled 89.05% of the votes.

families to "shape and pursue the vision of the business in a manner that is potentially sustainable across generations of the families" (Chua et al., 1999, p. 25), who are to follow controlling family owners' desired ways to run the firms, and who are to facilitate families' pursuing and maximizing noneconomic goals and benefits (Gedajlovic et al., 2004; Morck and Steier, 2005; Combs, 2008; Jones et al., 2008). Therefore, overall, management in family firms, which may consist of family members, non-family members, or both, would facilitate families' realizing family-oriented goals, which in turn enhances controlling family owners' intention to protect managers by using control enhancing governance provisions.

On the other hand, although maintaining family influence and power may potentially create incentives for controlling family owners to protect themselves and managers by utilizing control enhancing governance provisions, they may not even need to do so, may not be able to do so, or may refrain from doing so for the following reasons: (a) Controlling family owners' already existing powerful control status, which arises from their significant stock ownership or their direct or indirect involvement in management, would generate little motivation for them to further protect themselves and managers by using control enhancing governance provisions (Kelly et al., 2000; Sundaramurthy and Kreiner, 2008); (b) Strong country-level investor protection mechanisms, which effectively protect minority shareholders' rights, would make controlling family owners less able (or even unable) to manipulate the adoption or the use of control enhancing governance provisions (Peng and Jiang, 2010); (c) The use of control enhancing governance provisions (e.g. resisting value-enhancing takeovers to maintain control status) can facilitate families' pursuance of noneconomic goals, which may only benefit families themselves but harm firm performance and reduce shareholder wealth (Gomez-Mejia et al., 2010). According to the steward theory proposed by Davis et al. (1997), families associate their firms' health and success with their own well-being and thereby function as stewards of their firms. Likewise, Zahra (2003) suggests that in family firms, families usually deem firm-oriented goals (e.g. maximizing shareholder wealth) as being more important than their own or

family-oriented goals. Therefore, from the perspective of families' stewardship tendency, controlling family owners may be refrained from utilizing control enhancing governance provisions.

2.4 Comparison of Risk-taking between Family and Non-family Firms

According to agency theory, the characteristics of a firm's ownership, governance, and control play a critical role in the firm's risk-taking activities (Jensen and Meckling, 1976; Fama, 1980; Fama and Jensen, 1983). In particular, Fama and Jensen (1983) suggest that family firms are usually more risk averse and thereby undertake less risky investments than non-family firms do. In addition, agency theory also suggests a close association between risk-taking and management equity ownership in a firm (Eisenhardt, 1989; Zajac and Westphal, 1994). Specifically, there is a positive relationship between managers' risk aversion and their equity ownership in the firm (Denis et al., 1997). Based on these aspects of agency theory, we expect the level of risk avoidance in family firms to be higher than that in non-family firms for the following reasons: (a) As we introduced before, family members are generally in a large undiversified equity position and dominantly occupy senior management positions in their firms, both of which constitute a close tie between their firms' health or success and their own wealth invested in the firms. In other words, a failure in any investment or strategic decision will have financial consequences borne by families, leading to "safety" as the number one priority to be considered when making such decisions as international development, the introduction of a new product to the market, the launch of a cost-efficiency scheme, the enhancement of R&D, and the dismissal of an executive etc. (Grinblatt and Titman, 2002).[10] As Zahra (2005) suggests, the risks of failure in such decisions are enormous, even for highly mature firms; (b) Beyond their

[10] Grinblatt and Titman (2002) define events such as *"*the success of new product innovations, cost-cutting efforts, a fire at a manufacturing plant, the discovery of an illegal corporate act, a management change, and so forth*"* as firm-specific components and define *"*the risk of a security that is generated by these firm-specific components*"* as firm specific risk (Grinblatt and Titman, 2002, p. 176).

concerns about their own wealth, another concern of current family members is how to successfully pass their firms to their next generations so that the financial and social well-being of future generations will not be harmed and endangered (James, 1999; Schulze et al., 2002; Dyer and Whetten, 2006).[11] Such survival concern will potentially affect family managers' risk-taking propensity. Compared with non-family firms, a family firm's name (generally presented as the family name) and the reputation associated with it are relatively highly valued and preserved across generations. Such persistent preservation of reputation will bring many advantages to family firms, e.g. a good and long-run relationship with external parties such as suppliers and capital providers. Due to both the succession (survival) concern and the reputation concern, family firms tend to be more risk averse.

Although all of the above arguments suggest that family firms tend to undertake fewer risks than non-family firms do, there is no consensus among the literature. For instance, Zahra (2005) finds some evidence that family ownership and involvement actually prompt risk-taking activities, whereas such risk-taking activities decrease with the length of CEO-founder's tenure. The underlying rationale behind Zahra's (2005) argument can be explained from two perspectives: (a) *Family ownership*—Families, usually as large shareholders of family firms, align their interests closely with those of the firms. Such alignment of interests can potentially prompt families to actively pursue innovations, growth opportunities, and even radical strategic changes. In addition, for their concerns about their own wealth and well-being, families have both strong incentives and powerful abilities to undertake risks in such ways that generate share value, provide more employment opportunities for their relatives, and make their firms more competitive in the market; (b) *Family involvement*—Both family involvement and control in board seats and family involvement in management positions enhance families' better understanding of their firms, including potential investment opportunities and their firms'

[11] Most of the studies on family businesses indicate that rather than simply pursuing a sustainable income stream, the major vision for current family members in a family firm is to pass on a legacy to their future generations (Dyer and Whetten, 2006).

competitive advantages and disadvantages in the market. Such better understanding facilitates families to better evaluate alternative investment options, which in turn prompts families to undertake carefully assessed risks, explore investment alternatives, and devise appropriate strategies to accomplish them. Another argument about family firms' tendency to undertake risky investments is from the perspective of families' propensity to pursue and maximize noneconomic goals and benefits, including the establishment of a family dynasty, the maintenance of family reputation and prestige, and the build-up of social capital etc., all of which in turn enhance families' desire to sustain family influence and control (Chrisman et al., 2003; Gomez-Mejia et al., 2007; Berrone et al., 2010; Gomez-Mejia et al., 2010; Chrisman et al., 2012). The objective of families' pursuit of noneconomic goals is to preserve socio-emotional wealth, or in other words, failure in accomplishing such noneconomic goals would result in loss of socio-emotional wealth (Chua et al., 1999; Gomez-Mejia et al., 2007; Berrone et al., 2010; Chrisman et al., 2012). Gomez-Mejia et al. (2007) argue that in order to prevent a potential loss of socio-emotional wealth, family firms are willing to bear substantial risks to their firm performance. Likewise, Chrisman et al. (2003) show that family firms would like to pursue socio-emotional wealth at the expense of tremendous performance hazard. Similarly, Berrone et al. (2010) document that family firms tend to undertake risky environmental investments that are far beyond regulatory standards, in which families undertake only a small portion of the risk but obtain the whole family socio-emotional benefits (e.g. elevated positive family image in the community) generated throughout those activities. Families' preference for pursuing and maximizing noneconomic goals and benefits arises from families' bearing only a small fraction of the costs involved in their expropriation of private benefits of control. Villalonga and Amit (2009) note that in family firms, families' control rights are usually greater than their cash flow rights, making families avoid bearing their fair share of the costs of their activities, which in turn increases families' motivation to expropriate private benefits from non-controlling shareholders and thereby intensifies principal-principal agency problems in family firms (Jensen and

Meckling, 1976; Claessens et al., 2002; Miller and Le Breton-Miller, 2006).[12]

The controversy about risk-taking activities of family firms is also from another perspective of agency theory. Agency theory implies that owners and managers have different views about firm specific risk. Specifically, shareholders can mitigate firm specific risk in their portfolio by diversification and thereby do not have too much concern about firm specific risk, whereas managers' income is contingent on firm specific risk, leading to strong incentives for managers to execute income smoothing techniques,[13] such as diversification and hedging,[14] to reduce their income exposure to firm specific risk (Aron, 1988; Denis et al., 1997). Such divergent views about firm specific risk constitute another aspect of conflicts of interests between owners and managers. However, families, usually as large shareholders of family firms, have both the incentives and the ability to monitor managers, and families normally occupy senior management positions (acting as owner-managers), both of which restrain risk-reducing activities by managers commonly observed in non-family firms. On the other hand, as we introduced before, families are generally in a large undiversified equity position in their firms, leading to substantial incentives for family members to actively pursue risk-reducing activities to compensate their disadvantageous equity diversification in their portfolio.

Overall, based on all of the above mixed arguments about risk-taking activities in family firms, the question of whether family firms undertake fewer or more risks than non-family firms do becomes an empirical issue. Therefore, we put forward our first research question:

[12] Maury (2006) and Ali et al. (2007) suggest that in family firms, principal-principal (controlling shareholders versus non-controlling shareholders) agency problems are more severe than principal-agent (owners versus managers) agency problems.

[13] There are other incentives for managers to carry out diversification: (a) managing firms with large size makes managers famous and dignified (Stulz, 1990); (b) executive compensation for managers usually increases with firm size (Jensen and Murphy, 1990; Gabaix and Landier, 2008); (c) the decrease in firm specific risk resulting from diversification makes managers' job secure and thereby increases managerial entrenchment (Amihund and Lev, 1981; Amihund et al., 1983; Shleifer and Vishny, 1989).

[14] For diversification, as we introduced in footnote #8, it can bring negative impact on firm value and thereby on shareholders' wealth. For hedging, Stulz (1990) suggests that hedging itself cannot increase firm value but can be excessively used by managers for self-interest purposes to reduce both their employment exposure and the exposure of their executive compensation (e.g. managerial stock options) to firm specific risk, leading to negative impact on firm value and thus on shareholders' wealth (Hagelin et al., 2007).

Research Question 1 (RQ1): Do family firms undertake fewer risks than non-family firms do?

We have now established that a firm's corporate governance characteristics have direct impact on the firm's risk-taking activities. Previous studies generally use two variables to measure or proxy for the degree of risk-taking in a firm's operation: (a) firm-level riskiness (i.e. volatility of returns-to-capital) measured by using the industry-adjusted volatility of firm-level earnings—namely the standard deviation of the deviation of a firm's EBITDA/Assets from its industry average; (b) firm specific risk (i.e. idiosyncratic risk) measured by using idiosyncratic volatility. However, in the literature, there is another school of thought and interpretation about idiosyncratic volatility. Previous studies unanimously suggest that idiosyncratic volatility is an ideal measure of stock price informativeness.[15] Moreover, previous studies also closely link stock price (informativeness) with corporate governance characteristics. For instance, Gompers et al. (2003) and Cremers and Nair (2005) suggest that corporate governance has direct impact on equity prices, whereas the relationship between corporate governance provisions and investors' expectations or information plays a critical role in equity returns and the variation in equity returns (Ferreira and Laux, 2007). Gorton et al. (2008) find that corporate governance structure is one of the important determinants of the informativeness of stock prices. Therefore, overall, we may think of corporate governance characteristics as a channel that links idiosyncratic volatility with stock price informativeness. Recall that our *RQ1* is to empirically examine whether family firms' unique corporate governance characteristics lead family firms to have higher or lower idiosyncratic volatility (i.e. firm specific risk) than non-family firms. Due to the interaction among idiosyncratic volatility, stock price informativeness, and corporate governance characteristics, in which the last element acts to connect the other two elements, we can now alternatively restate *RQ1* as follows:

Research Question 2 (RQ2): Do family firms have less firm specific information

[15] Such previous studies include Roll (1988), Morck et al. (2000), Bushman et al. (2002), and Durnev et al. (2003).

impounded into stock prices than non-family firms?

However, before conducting any empirical analysis and testing, we first need to respectively sort out the relationship between each pair of elements among idiosyncratic volatility, stock price informativeness, and corporate governance characteristics.

2.5 Idiosyncratic Volatility and Stock Price Informativeness

In an efficient stock market, stock prices should closely reflect firm fundamentals. Information about firm fundamentals can be absorbed into stock prices through two paths: (a) Stock prices generally respond to the release of public information, e.g. quarterly earnings; (b) The trading by investors with private information (i.e. informed trading) leads to stock price variation (Durnev et al., 2003).[16] Ferreira and Laux (2007) suggest that idiosyncratic volatility is a proxy for information (especially firm specific information) impounded into stock prices. In other words, corporate private information is a major determinant of idiosyncratic volatility. Other researchers also find a high connection between idiosyncratic volatility and information flow. For instance, in Roll's (1988) study, the author finds low R^2 statistics for common asset pricing models and argues that the explanation for this result observed is due to firm specific return variation (i.e. idiosyncratic volatility) not associated with public information released but associated with private information.[17] Hence, Roll (1988) suggests that idiosyncratic volatility reflects private information, rather than public information, that is impounded into stock prices.

[16] Observing low R^2 statistics for common asset pricing models, Roll (1988) argues that this path—namely informed trading—is particularly critical in the process of incorporation of firm specific information into stock prices.

[17] Roll (1988) documents that stock price variations (i.e. stock returns) are generally attributed by financial economists to systematic economic influences, industry influences, and firm specific events. After eliminating the explanatory influences of the former two, *theoretically*, the remaining variation in a firm's stock price is ascribed to its firm specific information released by the financial press or the media (in other words, any information deemed by the media or the financial press as being insignificant and thereby negligible would be assumed to have no significant impact on the firm's stock price). By investigating only time intervals in which no firm specific information or news is reported (in this case, *theoretically*, the variations in stock prices should be explained only by systematic economic influences, which should thereby lead to high R^2 statistics), however, Roll (1988, p. 566) finds low R^2 statistics for common asset pricing models, which implies "the existence of either private information or else occasional frenzy unrelated to concrete information". Chen et al. (2007, p. 626) note that the relative significance of these two explanations is an empirical issue and that "empirical evidence documented since then [Roll (1988)] provides strong support to the hypothesis that price nonsynchronicity reflects more private information than noise".

Durnev et al. (2003) show that more information about future earnings is impounded into stock prices with high levels of idiosyncratic volatility. Based on their study, the authors conclude that idiosyncratic volatility is positively associated with stock price informativeness and that idiosyncratic volatility reflects trading on private information (i.e. informed trading).[18] According to Durnev et al. (2004), idiosyncratic volatility generally reflects information intensity and particularly reveals private information. Durnev et al. (2004) also suggest that the use of firm specific return variation (i.e. idiosyncratic volatility) as a proxy for stock price informativeness can be justified both conceptually and empirically: (a) Conceptually, it is the trading by investors with private information (i.e. informed trading) that results in stock return variation. Lower cost of private information can encourage more intensive informed trading, leading to higher firm specific variation and a more informative price;[19] (b) Empirically, as we introduced before, many previous studies, such as Roll (1988), Morck et al. (2000), Bushman et al. (2002), and Durnev et al. (2003), find a high connection between firm specific variation and stock price informativeness. Morck et al. (2000) establish the connection by arguing that in countries with well-developed financial systems, traders have more incentive to collect firm specific information on individual firms, leading to more firm specific information to be impounded into stock prices.[20] Overall, the underlying rationale behind those studies is that if a firm's stock

[18] Durnev et al. (2003) define stock price informativeness as how much information about future earnings stock prices contain (Durnev et al., 2003, p. 833).

[19] Grossman and Stiglitz (1980, p. 405) argue *"*because [collecting private] information is costly, prices cannot perfectly reflect the information which is available, since if it did, those who spent resources to obtain it would receive no compensation.*"* One of the basic comparative statics results obtained by Grossman and Stiglitz (1980, p. 399) from their model is that *"*a decrease in the cost of [collecting private] information increases the informativeness of the price system*"* by encouraging more informed trading. Durnev et al. (2004, p. 67) provide further comments on Grossman and Stiglitz's (1980) result: *"*In a market with many risky stocks, during any given time interval, [private] information about the fundamental values of some firms might be cheap, while [private] information about the fundamental values of others might be dear. Traders, ceteris paribus, obtain more private information about the former and less about the latter. Consequently, the stock prices of the former, moving in response to informed trading, are both more active and more informative than the stock prices of the latter.*"*

[20] By regressing individual stock return on market return and then obtaining the average R^2 statistics for these regressions in different countries, Morck et al. (2000) find low average R^2's in countries with well-developed financial systems (e.g. the United States) but high average R^2's in emerging markets (e.g. China). This phenomenon is attributed by Morck et al. (2000) to different levels of private property rights and shareholder protection in these sample countries. Specifically, government's respect of private property rights and better shareholder protection in a country (i.e. a country with a low average R^2) would encourage traders to acquire firm specific information—an argument which is consistent with Roll's (1988) proposition that low R^2 statistics

return is highly correlated or synchronized with the market return, then the firm's stock price is less likely to reflect firm specific information (Chen et al., 2007)—a rationale that intuitively explains the mechanism of the market model presented in Section 3.1.1.

2.6 Corporate Governance and Stock Price Informativeness

Ferreira and Laux (2007) suggest that corporate governance provisions can potentially affect investors' expectations and information flow. Gompers et al. (2003) use the number of antitakeover provisions, which is commonly known as G-index, as a proxy for the quality of corporate governance. Fewer antitakeover provisions can result in more private information flow and thereby higher levels of idiosyncratic volatility (Ferreira and Laux, 2007). This can be explained through several perspectives. From the perspective of agency theory, fewer antitakeover provisions in a firm reflect its openness to the market for corporate control, leading to strong investor protection.[21] Clark et al. (2010) suggest that "democratic firms" (firms with 5 or fewer antitakeover provisions) perform better and have fewer agency problems than "dictator firms" (firms with 14 or more antitakeover provisions) and "neutral firms" (firms with 6 to 13 antitakeover provisions inclusive). Gompers et al. (2003) suggest that firms with more antitakeover provisions (i.e. more insulated from takeovers) are less shareholder-friendly. In other words, under fewer antitakeover provisions, a firm experiences less expropriation of outside investors by insiders which include both large shareholders and managers. This reduced expropriation can prompt investors to own and trade the firm's shares, which can directly facilitate more information flow and thereby indirectly facilitate private information flow. From

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are associated with the trading by investors with private information (i.e. informed trading) (Morck et al., 2000; Durnev et al., 2004).

[21] Potential takeover threats can function as a type of external governance mechanism, which is generated by the market for corporate control, to discipline managers; when an actual takeover happens, it can bring benefits to shareholders by generating gains (e.g. substantial positive abnormal returns) and facilitating value-enhancing changes (e.g. replacing ineffective managers, whom the current board of directors is unwilling or unable to discipline, and reorganizing control and management of corporate recourses) (Jensen and Ruback, 1983; Jensen, 1988; Davis, 1991; Berkovitch and Narayanan, 1993; Sundaramurthy et al., 1996; Cremers and Nair, 2005).

the perspective of a trading link hypothesis proposed by Ferreira and Laux (2007), fewer antitakeover provisions in a firm, which indicate a greater likelihood of takeover, create more incentives for traders to speculate and then collect and trade on private information about the firm.[22] According to Glosten and Milgrom (1985) and Kyle (1985), information generated by speculative traders is impounded into market prices throughout the trading process. As Grossman and Stiglitz (1980) suggest, those information collection activities by traders can result in more informed trading and more informative pricing, leading to stock prices with more firm specific information impounded.

From the above review of previous relevant literature, one of the key phrases that frequently appears is "informed trading". In other words, informed trading is a major factor responsible for firm specific return variation (i.e. idiosyncratic volatility). Therefore, we now investigate the relationship among family ownership and control characteristics, informed trading, and stock price informativeness—a relationship which can shed more light on our *RQ2* developed before.

2.7 Family Ownership and Control Characteristics, Informed Trading, and Stock Price Informativeness

First of all, let us once again emphasize the prevalence of family firms in the United States. Approximately one-third of the S&P 500 firms are founding-family controlled firms (Anderson and Reeb, 2003a). Compared with other categories of organization structures, family controlled firms have their own unique characteristics in terms of corporate governance mechanism,

[22] Ferreira and Laux (2007, p. 952) enumerate three previous studies that show or imply evidences that speculators involved in takeover collect and trade on private information: *"*Larcker and Lys (1987) show that speculators in takeover situations are better informed about the likelihood of success, which suggests that, indeed, they have collected private information. Moreover, Jindra and Walkling (2004) show that offer prices are closer to market prices when there is a large price run-up prior to the offer—exactly what should occur if speculators collect and trade on private information in the pre-offer period. Second, fewer takeover restrictions could indicate that managers are not expecting a control offer (Comment and Schwert (1995)), implying that speculators may profit from correctly anticipating a higher probability of an offer. Third, fewer takeover restrictions could indicate that a firm's management or board would have limited bargaining power in the event of a control offer (Comment and Schwert (1995)), thereby attracting speculators who would prefer to quickly tender in response to an offer.*"*

including family ownership, family involvement and control in board seats, and family involvement in management positions (e.g. CEO). As we presented before, all of these characteristics of corporate governance in family controlled firms, combined with investors' expectations or information, have a direct impact on equity returns. Also, as Ferreira and Laux (2007) demonstrate, corporate governance mechanism can affect information flow about firms. In other words, all of these ownership and control characteristics in a family controlled firm potentially affect the firm's information flow impounded into its stock price. Besides, we comment that informed trading is a major factor responsible for firm specific return variation (i.e. idiosyncratic volatility). Anderson et al. (2011) find extensively higher volume of informed trading in family controlled firms and suggest that family control characteristics, such as family involvement and control in board seats, tend to strengthen such informed trading. As we previously described, informed trading can result in higher firm specific variation and a more informative price, Anderson et al.'s (2011) finding therefore indicates that family control characteristics affect stock price informativeness and thereby idiosyncratic volatility.

In family controlled firms, controlling family members are well-informed shareholders and may be the main force of informed trading, because they have long-run knowledge, expertise, and privileged information about the firms and thereby have strong incentive to profit from informed trading by taking advantage of their information edge (Anderson and Reeb, 2003a; Morck et al., 2005; Jaffe, 2006). Anderson et al. (2011) point out that unlike professional managers, controlling family members who are not involved in management positions are less scrutinized by regulators and thereby face less constraints on informed trading on privileged information. Anderson et al. (2011) also posit that family controlled firms can facilitate leakage of private information about firms both directly and indirectly: (a) Disharmony or even conflicts of interests among family members in a family controlled firm can result in detrimental activities by those family members who are not employed by the firm (Schulze et al., 2003). Such detrimental activities may include information leakage to outside investors with incentive to

engage in informed trading; (b) As Anderson and Reeb (2003a) suggest, managerial entrenchment, resulting both from families' intervention in choosing managers and directors and from incompetent and unqualified family members' occupation in management positions, is one of the major potential costs of family ownership. Other employees who are not family members may feel resentful of such managerial entrenchment in family controlled firms and thereby intentionally divulge information to outside investors with the incentive to engage in informed trading.

However, on the other hand, family shareholders may also tend to restrict active traders or other corporate insiders from trading their firms' shares. Due to their long standing presence in the firms, founding families are more concerned about their reputation, because their reputation can potentially affect the relationship between their firms and external parties, e.g. suppliers and capital providers (Anderson and Reeb, 2003a). Therefore, in order to preserve their reputation, family shareholders may have the incentive to refrain from informed trading on their privileged information.

To sum up, family shareholders may have both the incentive to take advantage of their private information and the incentive to restrict informed trading either by themselves or by other corporate insiders and outside active traders. Thus, whether family ownership and control characteristics facilitate or curb informed trading, and thereby affect stock price informativeness, is an empirical issue.

As Ferreira and Laux (2007) and other previous studies suggest, idiosyncratic volatility is an ideal proxy for information flow (especially private information) about firms, therefore we can deduce that family ownership and control characteristics are some of the determinants of a family firm's idiosyncratic volatility.

Therefore, we expect a difference in idiosyncratic volatility, and thereby in information flow impounded into stock prices, between family and non-family controlled firms. This expectation constitutes one of the central objectives of our study (*RQ2*). Specifically, by mainly following

Ferreira and Laux's (2007) empirical framework and incorporating a family binary variable into it, we examine whether family controlled firms have higher or lower idiosyncratic volatility than non-family controlled firms. Since idiosyncratic volatility is an indicator of information flow about firms, we can empirically test whether family-controlled firms have more or less firm specific information impounded into stock prices than non-family controlled firms.

Corporate governance mechanisms do not only affect a firm's stock price informativeness (i.e. idiosyncratic volatility) as we previously discussed, but also affect the quality of the firm's financial reporting (e.g. earnings quality or informativeness) (Wang, 2006). Existing literature has consistently showed that the quality of a firm's financial reporting is positively associated with the firm's corporate governance mechanism (Wang, 2006).[23] For typical U.S. public firms with a separation of ownership and control, in which professional managers rather than diffused outside shareholders dominate corporate decision making, professional managers have strong incentives to manipulate financial accounting information by distorting the substance or essence of underlying economic transactions to expropriate private benefits from both shareholders and creditors (Healy and Kaplan, 1985; Christie and Zimmerman, 1994; Warfield et al., 1995; Leuz, et al., 2003). However, if contracting terms are devised by contracting parties (e.g. debt contracting terms devised by creditors) to be highly contingent on the quality of financial reporting, firms would have strong motivation to deliver high quality financial accounting information to get better contracting terms such as a lower cost of capital (Ball et al., 2000; Ball et al., 2003; Ball and Shivakumar, 2005; Wang, 2006). Many previous studies in the accounting literature have examined the relation between the quality of financial earnings and different characteristics of ownership structure. Warfield et al. (1995) find that earnings quality is positively associated with managerial ownership. By investigating the relation between the informativeness of accounting earnings and corporate ownership structure in East Asia, Fan and

[23] Due to potential endogeneity concern, we do not arbitrarily state whether superior corporate governance mechanisms lead to higher quality financial reporting.

Wong (2002) show that firms with higher concentrated ownership demonstrate lower earnings informativeness.[24] Francis et al. (2005) report that earnings response coefficient (ERC), which is one of the commonly accepted proxies for earnings quality or informativeness in the accounting literature, is significantly lower for dual class stocks than for single class stocks, suggesting that single class firms demonstrate higher earnings informativeness than dual class firms.

As our brief summarization (at the end of Section 2.2) of corporate governance characteristics in family firms demonstrates, families, as a special class of concentrated shareholders, are in a large undiversified equity position, have a long standing investment horizon (as opposed to managerial myopia commonly observed in non-family firms (Stein, 1988; Stein, 1989)), view survival, succession, and reputation issues as major concerns, and normally occupy senior management positions, all of which place families in a uniquely advantageous position to impose their distinctive corporate governance and control on their firms. Due to these unique ownership and control characteristics of family firms, we expect that earnings quality in such a unique ownership and control context would accordingly exhibit distinctive features. Therefore, in the following section, we will discuss in detail the relation between family ownership and control characteristics and earnings quality.

2.8 Family Ownership and Control Characteristics and Earnings Quality

Family firms' unique ownership and control characteristics have potential impact, both positive and negative, on earnings quality.

2.8.1 The Negative Impact of Family Ownership and Control Characteristics on Earnings Quality

According to traditional agency theory, controlling large shareholders have powerful

[24] Fan and Wong's (2002) study is based on a sample of 977 firms in seven East Asian economies.

incentives to expropriate private benefits at the expense of minority shareholders (Fama and Jensen, 1983; Shleifer and Vishny, 1997). Therefore, families' significant stock ownership, active involvement and control in board seats, and dominant occupation in senior management positions would create incentives for family members to manipulate accounting earnings to exploit private benefits. Examples of such expropriation by family members through earnings manipulation include hiding the negative consequences of related party transactions and entrenching family members in management positions (Ali et al., 2007).

On the other hand, concentrated ownership may not only cause agency problems between controlling large shareholders and minority shareholders, but also bring benefits, such as effective monitoring on management (Shleifer and Vishny, 1997).[25] Demsetz and Lehn (1985) show that concentrated ownership creates strong incentives for controlling large shareholders to minimize agency problems (e.g. managerial expropriation) and maximize firm value, thereby aligning the interests of controlling large shareholders closely with those of minority shareholders. As we previously discussed in Section 2.2.1, one major advantage generated from family ownership, which is a special class of concentrated ownership, is the monitoring effect through which families have both the incentives and the ability to oversee and discipline managers. In addition to effective monitoring on management, family firms' long term investment and business horizon (as opposed to managerial myopia commonly observed in non-family firms (Stein, 1988; Stein, 1989)) as well as survival, succession, and reputation concern all enhance the alignment of interests between families and other shareholders, thereby indicating a superior corporate governance in family firms. However, if users of financial accounting information, e.g. contracting parties such as creditors,[26] perceive ex ante that family

[25] Gilson and Gordon (2003) document that despite the potential principle-principle agency problems arising from the presence of controlling large shareholders, minority shareholders would still desire the existence of such entities in a firm since the benefits generated from the decrease in principle-agent agency problems are usually greater than the costs resulting from the expropriation of private benefits of control.

[26] Users of financial statements generally include shareholders, creditors, or other contracting parties who rely on high quality financial accounting information to devise contracting terms and monitor managers (Wang, 2006).

firms have stronger corporate governance, and thereby accordingly devise their contracting terms to be less contingent on the quality of financial statements, family firms would in turn have less motivation to deliver high quality financial accounting information. Similar to this argument, Bushman et al. (2004) point out that due to the mutually substitutive effects between direct monitoring activities and the quality and timeliness of the disclosure of financial accounting information, the effective monitoring by family owners on management would potentially reduce the demand for (or reliance on) accounting information (for the purpose of monitoring managers) from other non-family shareholders, thereby leading to less incentive for family firms to provide high quality financial accounting information. Bushman et al.'s (2004) argument is consistent with Ball and Shivakumar's (2005) documentation that the quality of financial reporting is positively associated with the market demand for quality accounting information.

2.8.2 The Positive Impact of Family Ownership and Control Characteristics on Earnings Quality

From the perspective of family firms themselves, the superior aspects of corporate governance arising from family firms' unique ownership and control characteristics (as just discussed in the above section) would lead family firms to report earnings in good faith, refrain from earnings manipulation that is harmful to the family's reputation and detrimental to the firm's long-run sustainability, and thereby produce high quality earnings (Wang, 2006).[27] In particular, due to the effective monitoring by families on management, family firms would rely less on earnings-based performance measures, but rather rely more on managers' effort detected through direct monitoring, to compensate their managers. This leads to less incentive (arising from managerial opportunism) for managers to manipulate earnings (Fields et al., 2001; Healy and Palepu, 2001; Chen, 2006). In addition, due to families' long-run knowledge, expertise, and

[27] Similarly, Klein (2002) suggests that superior corporate governance would reduce managers' incentives—incentives arising from managerial opportunism—to manipulate earnings.

privileged information about their firms, it would be much easier for family members to detect managers' earnings manipulation and "thereby keep this activity in check" (Ali et al., 2007, p. 239). Moreover, the potential earnings management conducted by managers would be further restrained if family members act as owner-managers. Lastly, due to their large undiversified equity position and their long term investment horizon, families would incur substantial costs from litigation and decreased stock prices if they exploit private benefits through earnings manipulation and such expropriation is detected by the market; such substantial costs would thereby potentially restrain family members' incentive to manipulate earnings (Ali et al., 2007).

On the other hand, the inferior aspects of corporate governance resulting from family firms' distinctive ownership structure (as just presented in the above section) could lead family members to expropriate private benefits from other shareholders through aggressive earnings manipulation. However, if contracting parties perceive ex ante the existence of such potential expropriation by families, they would accordingly devise stricter contracting terms and require higher quality earnings so that their interests and benefits are better protected. Under this circumstance, family members would have strong incentives to report high quality earnings to obtain better contracting terms. In addition, because family firms' long term investment horizon would potentially reduce their concern about short-term capital market pressure, family firms would have less incentive to meet or beat markets' expectations of earnings, be less likely to manipulate earnings, and thereby provide high quality accounting earnings (Chen et al., 2008).[28]

Overall, as we discussed, according to the existing theories and arguments about the mixed impact (both positive and negative) of family ownership on earnings quality, it is undetermined whether family firms on average have higher or lower earnings quality than non-family firms. In other words, the relation between family firms' unique ownership structure and earnings quality is an empirical issue. Therefore, we put forward our third research question:

[28] Chen et al.'s (2008) argument is to some extent consistent with Stein's (1989) documentation that managers are generally interested in long-term earnings and therefore would not focus on short-term earnings if their firms are not facing capital market pressure.

Research Question 3 (RQ3): Do family firms have better earnings quality than non-family firms?

3. Data, Measures, and Methodology

3.1 Corporate Risk-taking Variables or Proxies

In order to examine the impact of corporate governance characteristics of a family firm on the firm's risk-taking activities, we first introduce the definition and nature of variables or proxies that measure the degree of risk-taking in a firm's operation, i.e. (a) firm specific risk or idiosyncratic risk ($IdioVol$)—namely idiosyncratic volatility; (b) the industry-adjusted volatility of firm-level earnings (*RISK1*)—namely the standard deviation of the deviation of a firm's EBITDA/Assets from its industry average.

3.1.1 Idiosyncratic Volatility ($IdioVol$)—The Market Model

The commonly used measure of idiosyncratic volatility in the literature is derived from the market model:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_{it} \quad (1)$$

In equation (1), R_{it} is the excess return for stock i at time t; R_{mt} is the excess value-weighted market index return at time t; $\beta_i = \frac{\sigma_{im}}{\sigma_m^2}$, where $\sigma_{im} = COV(R_{it}, R_{mt})$ and $\sigma_m^2 = VAR(R_{mt})$; $\beta_i R_{mt}$ is the systematic (or market-related) component of R_{it}; ϵ_{it} is the firm-specific component of R_{it}. The key assumption of the market model is that the market-related component and the firm-specific component are independent, i.e. $COV(R_{mt}, \epsilon_{it}) = 0$.

Based on the market model, the variance of stock i's excess return can be decomposed into

two components:[29]

$$\sigma_i^2 = \beta_i^2 \sigma_m^2 + \sigma_{i\epsilon}^2 \quad (2)$$

In equation (2), $\sigma_i^2 = VAR(R_{it})$; $\beta_i^2 \sigma_m^2$ measures firm i's market risk (or systematic risk); $\sigma_{i\epsilon}^2$, which is called (absolute) idiosyncratic volatility, measures firm i's firm specific risk (or idiosyncratic risk). After substituting $\beta_i = \frac{\sigma_{im}}{\sigma_m^2}$ into equation (2) and rearranging the equation, we get the definition of idiosyncratic volatility:[30]

$$\sigma_{i\epsilon}^2 = \sigma_i^2 - \frac{\sigma_{im}^2}{\sigma_m^2} \quad (3)$$

Ferreira and Laux (2007) introduce in their study the concept of relative idiosyncratic volatility—defined as the ratio of idiosyncratic volatility to total volatility, $\frac{\sigma_{i\epsilon,t}^2}{\sigma_{it}^2}$, at time t. This measure is exactly $1 - R_{it}^2$ of equation (1).[31] By following Ferreira and Laux (2007), we use in our study the logistic transformation of $1 - R_{it}^2$ due to the undesirable bounded property of R^2 $(0 \leq R^2 \leq 1)$ and thus $1 - R^2$ $(0 \leq 1 - R^2 \leq 1)$. Specifically, the measure of idiosyncratic volatility used in our study is expressed as follows:

$$IdioVol_{it} = ln\left[\frac{(\frac{\sigma_{i\epsilon,t}^2}{\sigma_{it}^2})}{(\frac{\sigma_{it}^2 - \sigma_{i\epsilon,t}^2}{\sigma_{it}^2})}\right] = ln\left(\frac{1-R_{it}^2}{R_{it}^2}\right) = ln\left(\frac{\sigma_{i\epsilon,t}^2}{\sigma_{it}^2 - \sigma_{i\epsilon,t}^2}\right) = ln\left(\sigma_{i\epsilon,t}^2\right) - ln(\sigma_{it}^2 - \sigma_{i\epsilon,t}^2) \quad (4)$$

In equation (4), we use a logistic transformed measure of idiosyncratic volatility ($\sigma_{i\epsilon,t}^2$) relative to market volatility ($\sigma_{it}^2 - \sigma_{i\epsilon,t}^2$). In addition, to be consistent with Durnev et al. (2004) and Ferreira and Laux (2007), we scale both idiosyncratic volatility and market volatility by total volatility (σ_{it}^2) to mitigate industry effects.[32]

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[29] For the mathematical derivation of equation (2), please refer to Elton et al. (2007) from p.134 to p.135.

[30] The exact name for $\sigma_{i\epsilon}^2$ is absolute idiosyncratic volatility.

[31] $R^2 = \frac{ESS}{TSS} = \frac{ESS}{ESS+RSS}$, where "ESS" represents explained sum of squares, "RSS" represents residual sum of squares, and "TSS" (TSS=ESS+RSS) represents total sum of squares, thus $1 - R^2 = \frac{RSS}{TSS}$ (i). $\sigma_{i\epsilon,t}^2 = \frac{RSS}{T}$, where T is the number of observations, thus $RSS = T\sigma_{i\epsilon,t}^2$ (ii). $\sigma_{it}^2 = \frac{TSS}{T}$, thus $TSS = T\sigma_{it}^2$ (iii). Substituting (ii) and (iii) into (i), $1 - R^2 = \frac{T\sigma_{i\epsilon,t}^2}{T\sigma_{it}^2} = \frac{\sigma_{i\epsilon,t}^2}{\sigma_{it}^2}$.

[32] According to Durnev et al. (2004) and Ferreira and Laux (2007), some firms in certain industries are more likely to be

3.1.2 Idiosyncratic Volatility ($IdioVol$)—The Industry Index Model (The Two-Factor Model)

The underlying rationale behind the market model is that stock returns are systematically correlated only because of their common co-movement with the market. However, other factors beyond the market, such as industry effects, can explain a large proportion of stock return variation.[33] Thus, in addition to the market model, following Durnev et al. (2004), we alternatively construct idiosyncratic volatility by using the industry index model (the two-factor model) as follows:

$$R_{i,j,t} = \alpha_{i,0} + \beta_{i,m} R_{m,t} + \beta_{i,j} R_{j,t} + \epsilon_{i,t} \quad (5)$$

In equation (5), $R_{i,j,t}$ is the excess return of firm i in industry j at time t; $R_{m,t}$ is the excess value-weighted market index return at time t; $R_{j,t}$ is the excess value-weighted return of industry j at time t; $\alpha_{i,0}$ is the constant; $\beta_{i,m}$ and $\beta_{i,j}$ are coefficients on $R_{m,t}$ and $R_{j,t}$ respectively; $\epsilon_{i,t}$ is the error term or the firm-specific component of $R_{i,j,t}$.

Based on the industry index model, stock return variation (σ_i^2) can also be decomposed into two components: firm-specific variation ($\sigma_{\epsilon,i}^2$) and systematic variation ($\sigma_{sys,i}^2$),[34] where the former one is defined as (absolute) idiosyncratic volatility and the latter one is the combination of market-related variation and industry-related variation. Consistent with Durnev et al. (2004), Ferreira and Laux (2007), and the measure of idiosyncratic volatility (equation (4)) derived from the market model, we construct the logarithmic transformed relative idiosyncratic volatility, $IdioVol_i$, which is used in our study, as follows:[35]

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affected by economic turbulences and thereby firm specific events (or firm specific information) associated with those turbulences would be accordingly more intensive in such firms, thus in both of these two studies, (absolute) idiosyncratic volatility is scaled by total volatility to eliminate such industry effects.

[33] Roll (1988, p. 541) documents that stock price variations (i.e. stock returns) are mainly attributed by financial economists to "(1) unpredictable movements in pervasive economic factors, (2) unpredictable changes in the firm's market environment, i.e., industry information, and (3) unpredictable events specific to the firm itself. "

[34] For both convenience and simplicity of expression, we denote systematic variation as $\sigma_{sys,i}^2$.

[35] $R^2 = \frac{ESS}{TSS} = \frac{ESS}{ESS+RSS}$, where "ESS" represents explained sum of squares, "RSS" represents residual sum of squares, and

$$IdioVol_i = ln\left[\frac{(\frac{\sigma^2_{\epsilon,i}}{\sigma^2_i})}{(\frac{\sigma^2_{sys,i}}{\sigma^2_i})}\right] = ln\left(\frac{1-R^2_i}{R^2_i}\right) = ln\left(\frac{\sigma^2_{\epsilon,i}}{\sigma^2_{sys,i}}\right) = ln(\sigma^2_{\epsilon,i}) - ln(\sigma^2_{sys,i}) \quad (6)$$

Basically, a higher value of $IdioVol_i$ would imply a higher proportion of firm-specific variation ($\sigma^2_{\epsilon,i}$) relative to the combination of market-related variation and industry-related variation ($\sigma^2_{sys,i}$) in accounting for the stock price movements of firm i.

3.1.3 The Industry-adjusted Volatility of Firm-level Earnings (*RISK1*)

Risk is the volatility or uncertainty embedded in outcomes generated from an activity or activities. From the perspective of corporate risk-taking, the more risky investment projects a firm undertakes and the more risky operations it is involved in, the more volatile will be its earnings (EBITDA) or its returns to capital (ROA). Enlightened by John et al. (2008) and Acharya et al. (2011), we devise an alternative proxy, other than idiosyncratic volatility, for the degree of risk-taking in a firm's operation—namely the industry-adjusted volatility of firm-level earnings (*RISK1*) which is defined as the standard deviation of the deviation of a firm's EBITDA/Assets (i.e. return on assets or ROA) from its industry average:[36]

$$RISK1 = \sqrt{\frac{1}{T-1}\sum_{t=1}^{T}(E_{i,j,t} - \frac{1}{T}\sum_{t=1}^{T}E_{i,j,t})^2} \quad (T=12; T=20) \quad (7)$$

"TSS" (TSS=ESS+RSS) represents total sum of squares, thus $1-R^2 = \frac{RSS}{TSS}$ (i). $\sigma^2_{\epsilon,i} = \frac{RSS}{T}$, where T is the number of observations, thus $RSS = T\sigma^2_{\epsilon,i}$ (ii). $\sigma^2_i = \frac{TSS}{T}$, thus $TSS = T\sigma^2_i$ (iii). Substituting (ii) and (iii) into (i), $1-R^2 = \frac{T\sigma^2_{\epsilon,i}}{T\sigma^2_i} = \frac{\sigma^2_{\epsilon,i}}{\sigma^2_i}$ (iv). After rearranging (iv), $R^2 = 1 - \frac{\sigma^2_{\epsilon,i}}{\sigma^2_i} = \frac{\sigma^2_i - \sigma^2_{\epsilon,i}}{\sigma^2_i} = \frac{\sigma^2_{sys,i}}{\sigma^2_i}$.

[36] John et al. (2008) use all available *annual* EBITDA/Assets of a firm over the 1992 to 2002 sample period as long as the firm has earnings and total assets available for at least 5 years over that period. In our study, different from John et al. (2008), we construct a firm's *RISK1* measure for a certain year by using quarterly data. Specifically, in order to be thorough and also for the purpose of robustness check, we consider two different scenarios in our study: (1) For firms with earnings and total assets available for at least 12 quarters, we only use the most recent 12 quarters of data ($T = 12$); (2) For firms with earnings and total assets available for at least 20 quarters, we only use the most recent 20 quarters of data ($T = 20$).

in which

$$E_{i,j,t} = \frac{EBITDA_{i,j,t}}{A_{i,j,t}} - \frac{1}{N_{j,t}} \sum_{k=1}^{N_{j,t}} \frac{EBITDA_{k,j,t}}{A_{k,j,t}} \quad (8)$$

In equation (8), $N_{j,t}$ denotes the number of firms within industry j at time t; $EBITDA_{i,j,t}$ represents the operating income before depreciation of firm i in industry j at time t; $A_{i,j,t}$ indexes the total assets of firm i in industry j at time t. The $RISK1$ measure in equation (7) is computed as follows: taking the scenario of $T = 20$ as an example, for a firm that has earnings and total assets available for at least 20 quarters over our sample period (2003—2007),[37] by only using the most recent 20 quarters of data, we first calculate the deviation of this firm's EBITDA/Assets from its industry average for the corresponding quarter and then compute the standard deviation of these 20 deviations for this firm.

3.2 Sample and Data

3.2.1 Sample Description

Business Week (2003) finds that family presence (in most cases, founders or their family members serving as board directors or occupying senior management positions) appear in 177 firms of the S&P 500. The criteria adopted by Business Week (2003) to identify family firms include families' occupation in senior management positions, families' involvement in board seats, or families' significant stock ownership. These criteria have been widely accepted and used among previous empirical studies on family business (Ali et al., 2007).[38] Therefore, in order to

[37] John et al. (2008) require at least 5 years of data, *within* their sample period (1992 to 2002), to compute the *RISK1* measure. In other words, the maximum possible sample period of the *RISK1* measure in John et al. (2008) is from 1996 to 2002. In our study, in order to match the maximum possible sample period of the *RISK1* measure with those of other variables, unlike John et al. (2008), we extend the sample period of EBITDA and total assets back to 1999 for the scenarios of $T = 20$, and back to 2001 for the scenarios of $T = 12$. By doing so, we have enough quarters of data to compute the *RISK1* measure as of years between 2003 and 2006 inclusive for the scenario of $T = 20$, and as of 2003 and 2004 for the scenario of $T = 12$.

[38] Ali et al. (2007) enumerate some merits of following Business Week's (2003) classification—"First, it is free of any subjective assessment of family influence, thus making the results more reliable. Second, to the extent a firm classified as family firm has only a weak family influence, it would introduce a conservative bias in our results." (Ali et al., 2007, p. 246)

better reconcile and compare our results with those of previous studies, we decide to follow Business Week's (2003) classification of family firms. Specifically, due to family firms' typical long-term business horizon, we first assume the identity of a family firm is relatively stable or fixed over time, and then apply those 177 family firms in the S&P 500 as of July 2003 for 5 years until 2007.[39]

3.2.2 Data Description

3.2.2.1 Dependent Variables

The main dependent variable for *RQ1* and *RQ2* is $IdioVol_{it}$, logarithmic transformed relative idiosyncratic volatility, which is defined in equations (4) and (6). In addition to $IdioVol_{it}$, an alternative dependent variable for *RQ1* and *RQ2*, $\sigma_{i\epsilon}^2$ or absolute idiosyncratic volatility which is defined in equation (3), is used for the purpose of robustness check. Moreover, for *RQ1*, we additionally take the *RISK1* measure (defined in equation (7)) as the dependent variable to capture the degree of risk-taking in a firm's operation.

Our dependent variable for *RQ3*, RET_t, is defined as 12-month cumulative raw return ending three months after the fiscal year-end at t.

3.2.2.2 $IdioVol$ (R^2)

$IdioVol$ is constructed by either using daily returns or using weekly returns.

(1) Using Daily Returns

Using all the daily returns in a certain year, we first obtain R^2 by running either the market model (equation (1)) or the industry index model (equation (5)). We then compute $IdioVol = ln\left(\frac{1-R^2}{R^2}\right)$, i.e. by following equation (4) or (6). However, the major potential issue involved in using daily returns is the problem of serial autocorrelation. Therefore, we alternatively construct

[39] For *RQ1* and *RQ2*, G-index is one of the main independent variables; for *RQ3*, we control for the firm-level riskiness (*RISK1*) but use the fitted value of *RISK1* (due to the endogeneity concern) obtained from *RQ1* with *RISK1* as the dependent variable. Since G-index is only available until 2007, the sample periods for *RQ1*, *RQ2*, and *RQ3* are all from 2003 to 2007.

$IdioVol$ by using weekly returns.

(2) Using Weekly Return

In order to overcome the day-of-the-week effect (or the weekend effect), by following Lo and MacKinlay (1988), we define a week as being from Thursday to the following Wednesday rather than being from Monday to Friday (i.e. the calendar week). Therefore, the weekly return in our study is computed as follows:[40]

$$(1 + R_{Thu}) \times (1 + R_{Fri}) \times (1 + R_{Mon}) \times (1 + R_{Tue}) \times (1 + R_{Wed}) = 1 + R_{weekly} \quad (9)$$

where R_{Thu}, R_{Fri}, R_{Mon}, R_{Tue}, and R_{Wed} respectively represent daily returns from Thursday to the following Wednesday correspondingly, where daily returns are computed as closing price changes plus dividends; R_{weekly} denotes the weekly return for the week from Thursday to the following Wednesday. We then use all the weekly returns in a certain year to run the market model or the industry index model and thereby obtain R^2. Finally, we calculate $IdioVol = ln\left(\frac{1-R^2}{R^2}\right)$.

3.2.2.3 Independent Variables

(1) The G-index (*GOV*)

A major independent variable in our study is the Investor Responsibility Research Center (IRRC) governance index (i.e. G-index) constructed by Gompers et al. (2003). The G-index is constructed based on the IRRC corporate governance provisions (28 provisions in total) such that 1 point is assigned to a firm for each provision adopted by this firm—a provision that reduces shareholder rights and increases managerial power—and then all the points this firm "earns" are summed up to a single number which is the G-index for this firm (Gompers et al., 2003). 26 out

[40] The term *"the weekly return"* here broadly refers to all kinds of returns involved in computing $IdioVol$ (R^2), including weekly risk-free return (wR_f), weekly stock return (wR_i), weekly industry return (wR_j), and weekly market index return (wR_m). Specifically, we first compute wR_f, wR_i, wR_j, and wR_m respectively by using equation (9); we then construct excess weekly stock return (ewR_i), excess weekly industry return (ewR_j), and excess weekly market index return (ewR_m) as being equal to wR_i - wR_f, wR_j - wR_f, and wR_m - wR_f respectively; finally we apply ewR_i, ewR_j, and ewR_m to either the market model or the industry index model to obtain R^2 and thereby $IdioVol$.

of the total 28 provisions have the similar effects—namely restricting shareholder rights and enhancing managerial power; however, there are two exceptional provisions, i.e. Secret Ballots and Cumulative Voting, which are to the advantage of shareholder rights (Gompers et al., 2003). Therefore, for each of these two exceptional provisions, 1 point is assigned to a firm if this firm does NOT adopt it. In addition, 24 out of the total 28 provisions are unique, or in other words, there are 4 pairs of overlapped provisions in which the 2 provisions in each pair have similar effects; under this circumstance, only 1 point rather than 2 points is assigned to a firm no matter whether this firm adopts either one or both of the 2 overlapped provisions in a pair (Gompers et al., 2003). Therefore, theoretically, the G-index can only be an integral number between 0 and 24 inclusive.

The G-index is generally used as a proxy for the quality of a firm's corporate governance. A firm with a higher G-index would indicate that this firm is more insulated from takeover and therefore replacing managers in this firm is more difficult and that managerial power in this firm is stronger than shareholder rights, both of which suggest that this firm has a weaker corporate governance and is less shareholder friendly (Gompers et al., 2003; Ferreira and Laux, 2007).

Because the IRRC only publishes the list of corporate governance provisions for each firm in Corporate Takeover Defenses every two or three years (Rosenbaum 1990, 1993, 1995, 1998, 2000, 2002, 2004, 2006), the G-index constructed by Gompers et al. (2003) is accordingly only available for these corresponding years (Gompers et al., 2003). Therefore, consistent with Gompers et al. (2003), we assume the G-index for each firm is fixed from the last IRRC publishing year until the next IRRC publishing year. For example, the G-index for a firm in 2003, 2005, and 2007 is equal to the G-index for this firm in 2002, 2004, and 2006 respectively.

(2) The Binary Indicator Variable for Family Firms (*FamFirm*)

Generally, in previous studies related to ownership structure, the fractional shareholdings of target entities in a firm (e.g. institutional shareholders, large shareholders, and multiple large

shareholders) are widely used as a measure of control for different ownership levels and thereby for different levels of those entities' influences on the firm (also different levels of those entities' interests in the firm), with a higher percentage of shareholdings indicating greater influences on the firm. However, this method may not ideally apply to capture or control for the influences—influences in terms of voting and controlling power—that families exert on their firms. Both Anderson and Reeb (2003a) and Wang (2006) suggest that because families' control rights and thereby influences are usually much greater and more extensive than their equity ownership levels would indicate, the binary variable of family ownership is more appropriate than the variable which is based on families' percentage equity holdings.[41] In addition, under the regulation of the Securities Exchange Act (SEA) of 1934, it is compulsory only for executives, board directors, and owners with at least 5 percent equity ownership to report their shareholdings in the proxy statement. Therefore, using the fractional shareholdings of family members reported under the SEA requirements may potentially underestimate the measurement of family ownership. For example, if a family member who is neither an executive nor a board director owns only 4.99 percent of the firm's shares, then under the SEA regulation, he or she is not required to report such 4.99 percent holdings in the proxy statement. Under this circumstance, we cannot include this 4.99 percent into the computation of fractional shareholdings of family members, thereby underestimating the measurement of family ownership. In order to overcome and avoid such uncertainty, we use a binary variable that is equal to one when the firm is a family firm as identified by Business Week (2003), and zero otherwise—namely, we create a dummy variable that is equal to one when families either occupy senior management positions or board seats or hold significant shares of the firm.

[41] Anderson and Reeb (2003a, p. 1308) present an example to illustrate that family members' equity ownership levels may not always accurately reflect families' control rights and thereby influences on their firms: appearing as if they were dominant large shareholders, the Ablon family controls the Ogden Corporation by owning only 2 percent of the company's shares, whereas the same family owns 24 percent of Nordstrom's shares to control the company.

(3) Control Variables

For *RQ1* and *RQ2* with $IdioVol$ as the dependent variable, we control for such factors, which are generally known and accepted by previous studies to explain the variation of idiosyncratic volatility, as profitability (return-on-equity), profitability volatility (volatility of return-on-equity), leverage, market-to-book ratio, market capitalization, dividend dummy, firm age, diversification dummy, and earnings smoothing. These control variables are described in detail in Appendix A: Definition of Control Variables for Regression Analysis on the Comparison in Idiosyncratic Volatility between Family and Non-family Firms.

For *RQ1* with *RISK1* as the dependent variable, we control for initial firm size, initial book leverage, initial sales growth, and initial corporate earnings. These variables of firm-level characteristics are constructed as of 2003 which is the beginning year of our sample period (2003-2007). Besides the four typical firm-level attributes, we further control for earnings smoothing incentives. Leuz et al. (2003) suggest that in order to exploit and expropriate private benefits of control, corporate insiders (i.e. controlling shareholders and managers) have strong incentives to manage or manipulate corporate earnings to prevent their expropriation activities and bad firm performance from being detected by outsiders. Since the essence of the *RISK1* measure is the volatility of corporate earnings, we consider earnings smoothing incentives as another factor, other than those fundamental firm-level characteristics, that may potentially affect the *RISK1* measure. By following Leuz et al. (2003), we proxy earnings smoothing incentives as the ratio (*ES1*) of the standard deviation of operating income to the standard deviation of operating cash flow (operating income minus accruals), in which both the numerator and the denominator are scaled by lagged total assets. The underlying rationale behind the *ES1* measure as a proxy for earnings smoothing incentives is that since manipulating accruals is the major way used by corporate insiders to smooth reported earnings, the lower the standard deviation of corporate earnings including accruals relative to the standard deviation of corporate earnings excluding accruals, the higher is the level of earnings smoothing—namely a lower value of *ES1*

would indicate a higher level of earnings smoothing. For convenience of expression, by following John et al. (2008), we convert *ES1* into *1 - ES1* and then rename the result as *ES2* (i.e. *ES2 = 1 - ES1*). After doing so, a higher value of *ES2* (i.e. a lower value of *ES1*) would indicate a higher level of earnings smoothing. Detailed information about all of these control variables is presented in Appendix B: Definition of Control Variables for Regression Analysis on the Comparison in Corporate Risk-taking between Family and Non-family Firms.

For *RQ3,* by following previous literature on earnings informativeness, such as Warfield et al. (1995), Fan and Wong (2002), Francis et al. (2005), and Wang (2006), we incorporate into our model several interaction terms between net income and varieties of firm-level characteristics such as firm size, firm leverage, firm age, return on assets, and market-to-book ratio etc.. Information about these variables is demonstrated in Appendix C: Definition of Control Variables for Regression Analysis on the Comparison in Earnings Informativeness between Family and Non-family Firms.

3.3 Research Design

3.3.1 Empirical Model for the Comparison in Idiosyncratic Volatility between Family and Non-family Firms

The main empirical framework for *RQ1* and *RQ2* in our study follows Ferreira and Laux's (2007, p. 962) regression equation and incorporates a family binary variable into it:

$$\begin{aligned} IdioVol_{it} = {} & c_0 + c_1 GOV_{i,t-1} + c_2 FamFirm_{i,t-1} + c_3 ROE_{i,t-1} + c_4 VROE_{i,t-1} \\ & + c_5 LEV_{i,t-1} + c_6 M/B_{i,t-1} + c_7 SIZE_{i,t-1} + c_8 DD_{i,t-1} + c_9 AGE_{i,t-1} \\ & + c_{10} DIVER_{i,t-1} + c_{11} ES2_{i,t-1} + c_{12} SysRisk_{i,t} + \epsilon_{i,t-1} \end{aligned} \quad (10)$$

Where i is a firm index; t indexes years; GOV is the IRRC governance index constructed by

Gompers et al. (2003);[42] $FamFirm$ is a binary variable that is equal to one when the firm is a family firm as identified by Business Week (2003), and zero otherwise; Control variables included in equation (10) are profitability (ROE), profitability volatility ($VROE$), leverage (LEV), market to book ratio (M/B), market capitalization ($SIZE$), dividend dummy (DD), firm age (AGE), diversification dummy ($DIVER$), earnings smoothing ($ES2$), and systematic risk ($SysRisk$).

3.3.2 Empirical Model for the Comparison in Corporate Risk-taking between Family and Non-family Firms

John et al. (2008) argue that stronger firm-level shareholder protection (lower G-index) is associated with a higher level of risk-taking in corporate investment. The underlying rationale behind the argument is that in firms with better corporate governance (i.e. firms being more shareholder friendly and with more effective monitoring), insiders are less likely to (or less able to) expropriate corporate resources for the purpose of exploiting private benefits and thereby are less inclined to preserve private benefits by being conservative about corporate risk-taking decisions (Shleifer and Wolfenzon, 2002; John et al., 2008). Other arguments, mainly from the perspective of managers' "safety" concerns, about the positive relationship between firm-level shareholder protection and corporate risk-taking exist in the literature. In order to minimize the risk of losing their jobs, managers tend to be conservative on corporate investment decisions (Amihud and Lev, 1981; Holmstrom and Ricart I Costa, 1986; Hirshleifer and Thakor, 1992). However, in firms with strong shareholder protection, effective monitoring would weaken managers' risk-averse behaviour, which can bring about a positive relationship between shareholder protection and corporate risk-taking.

[42] The IRRC governance index data constructed by Gompers et al. (2003) are available from Professor Andrew Metrick's website: http://faculty.som.yale.edu/andrewmetrick/data.html

$$RISK1_{i,t} = \alpha_0 + \alpha_1 GOV_{i,t} + \alpha_2 FamFirm_{i,t} + \alpha_3 InitialSalesGrowth_{i,t} + \alpha_4 InitialBookLeverage_{i,t} + \alpha_5 LogInitialFirmSize_{i,t} + \alpha_6 InitialCorporateEarnings_{i,t} + \alpha_7 ES2_{i,t} + \epsilon_{i,t} \quad (11)$$

$$RISK1_{i,t} = \alpha_0 + \alpha_1 GOV_{i,t} + \alpha_2 FamFirm_{i,t} + \alpha_3 GOV_{i,t} \times FamFirm_{i,t} + \alpha_4 InitialSalesGrowth_{i,t} + \alpha_5 InitialBookLeverage_{i,t} + \alpha_6 LogInitialFirmSize_{i,t} + \alpha_7 InitialCorporateEarnings_{i,t} + \alpha_8 ES2_{i,t} + \epsilon_{i,t} \quad (12)$$

Following John et al. (2008), in equation (11) and (12),[43] we regress volatility of corporate earnings (*RISK1*) on the variable (*GOV*) that reflects firm-level shareholder protection or shareholder friendliness and control for other fundamental firm-level characteristics such as initial firm size, initial book leverage, initial sales growth, initial corporate earnings, and earnings smoothing. Following John et al. (2008), all of these control variables, except earnings smoothing (*ES2*), are constructed as of 2003 which is the beginning year of our sample period (2003-2007). For earnings smoothing (*ES2*), we construct the variable for every year within our sample period. Similar to the model with $IdioVol$ as the dependent variable, we incorporate the family dummy variable to test whether family firms undertake more or fewer risks than non-family firms do. In addition, by including an interaction term between G-index and the family dummy variable (see equation (12)), we further investigate the impact of family ownership and control on G-index and thereby the combined impact of family ownership and control and G-index on firm-level riskiness. Many agency-theoretic models suggest that stronger investor protection (lower G-index) is associated with higher firm-level riskiness (John et al., 2008).[44] Now the question is: what if the factor of family presence is incorporated? In other

[43] In both equation (11) and (12), i and t index firms and years respectively; GOV and $FamFirm$ are defined the same as those in equation (10).

[44] By conducting both a cross-country study (39 countries) and a single country study (the United States), John et al. (2008)

words, would family ownership and control intensify or weaken the effect of G-index on corporate risk-taking decisions? As we previously discussed in Section 2.3, due to their distinctive corporate governance characteristics, family firms would accordingly demonstrate their particularistic propensity to use governance provisions idiosyncratically. Therefore, governance provisions (or G-index) are expected to interact with family involvement to affect the risk-taking levels in corporate investment.

3.3.3 Empirical Model for the Comparison in Earnings Informativeness between Family and Non-family Firms

In the existing accounting literature, there are three widely accepted proxies for earnings quality: abnormal accruals, persistence of transitory loss components in earnings, and earnings informativeness (Wang, 2006). As one of the major research components in our study is related to information flow in family businesses, we use earnings informativeness as a proxy for earnings quality to examine the impact of family firms' unique ownership and control characteristics on earnings quality. Earnings informativeness is measured as the coefficient on earnings by regressing returns on earnings—namely the earnings response coefficient (ERC) (Teoh and Wong, 1993; Francis et al., 2005). Many previous studies, e.g. Warfield et al. (1995), Fan and Wong (2002), and Francis et al. (2005), have used ERC to measure earnings quality. In theory, higher earnings informativeness (i.e. higher ERC) indicates better earnings quality (Wang, 2006).

The main empirical framework for *RQ3* in our study follows Wang's (2006, p. 631) regression equation. However, different from Wang (2006) and other previous studies on earnings informativeness, we additionally control for the degree of risk-taking in a firm's operations (*RISK1*). As we introduced before, the essence of the *RISK1* measure is the volatility

empirically examine the relationship between shareholder protection and firm-level riskiness and find in both studies a positive relationship between these two—namely *"*stronger shareholder protection is associated with higher firm-level riskiness*"* (John et al., 2008, p. 1681).

of corporate earnings. Therefore, by incorporating the interaction term between earnings and the *RISK1* measure, we can examine whether the fluctuation of corporate earnings (i.e. *RISK1*), being either higher or lower, would prompt firms to manipulate earnings or to report earnings in good faith. However, as a firm's stock return (RET) and the degree of risk-taking in its operation (*RISK1*) could be jointly impacted by its firm-level investor protection (*GOV*), we control for *RISK1* by using the fitted value of *RISK1* obtained from equation (11). Instead of controlling for firm operating risk (*RISK1*), we alternatively control for firm idiosyncratic risk ($IdioVol$), by which we can examine whether earnings are more informative for firms with higher stock price informativeness (i.e. higher idiosyncratic risk). Since a firm's idiosyncratic risk ($IdioVol$) could also be impacted by its firm-level shareholder protection and other factors, we control for $IdioVol$ by using the fitted value of $IdioVol$ obtained from equation (10).

$$\begin{aligned} RET_t = {} & \beta_0 + \beta_1 NI_t + \beta_2 NI_t \times FamFirm_t + \beta_3 NI_t \times RISK1_t + \beta_4 NI_t \times SIZE_t \\ & + \beta_5 NI_t \times LEV_t + \beta_6 NI_t \times MB_t + \beta_7 NI_t \times AGE_t + \beta_8 NI_t \times LOSS_t \\ & + \beta_9 NI_t \times ROA_t + \beta_{10} FamFirm_t + \beta_{11} RISK1Fit_t + \beta_{12} SIZE_t \\ & + \beta_{13} LEV_t + \beta_{14} MB_t + \beta_{15} AGE_t + \beta_{16} LOSS_t + \beta_{17} ROA_t + \epsilon_t \end{aligned} \tag{13}$$

Where t indexes years; $FamFirm$ is a binary variable that is equal to one when the firm is a family firm as identified by Business Week (2003), and zero otherwise;[45] Other variables involved in equation (13) include RET_t, 12-month cumulative raw return ending three months after the fiscal year-end at t; NI_t, the change in net income from year $t-1$ to year t, scaled by the market value of equity at the end of $t-1$; $SIZE_t$, the natural logarithm of market value of equity at t; LEV_t, firm leverage at t, measured by long-term debt divided by total assets; MB_t, market-to-book ratio at t; AGE_t, the natural logarithm of firm age in years at t; $LOSS_t$,

[45] Wang (2006) suggests that because families' control rights and thereby influences are usually much greater and more extensive than their equity ownership levels would indicate, the binary variable of family ownership is more appropriate than the variable which is based on families' percentage equity holdings.

one if net income is negative, and zero otherwise; ROA_t, return on assets at t; ϵ_t, error term.

A significantly negative (positive) estimated value for β_2, the coefficient on the interaction term $NI_t \times FamFirm_t$, would indicate that family firms' earnings are less (more) informative than non-family firms' earnings—or alternatively speaking, family firms have worse (better) earnings quality than non-family firms.

4. Results

4.1 Descriptive Statistics and Univariate Statistics

4.1.1 Variables Involved in Regression Analysis on the Comparison in Idiosyncratic Volatility between Family and Non-family Firms[46]

Panel A of Table 1 reports descriptive statistics for the volatility variables, $IdioVol$ and $SysRisk$, over our sample period (2003-2007). We construct each of these volatility variables for each sample year t, generating 2,327 firm-year observations. We can deduce from the summary statistics for $IdioVol$ that (absolute) idiosyncratic volatility, on average, accounts for 76.04% of total individual stock volatility.[47] Panel B of Table 1 reports descriptive statistics for the independent variables, including the G-index, which has 2,363 firm-year observations and has a median of 10 and a standard deviation of 2.42. The firms in the entire sample are on average 28 years old, indicating that they are quite mature firms rather than new ventures that just finished the initial public offering (IPO) process.

[Insert Table 1 Here]

[46] Following Ferreira and Laux (2007), we winsorize extreme observations of the continuous variables at the 1st and 99th percentiles to avoid spurious inferences generated by the undue influence of outliers.

[47] As we previously defined and derived (see equation (4) and (6) and footnote #31), $IdioVol = \ln\left(\frac{1-R^2}{R^2}\right)$ and $\frac{\sigma^2_{i\epsilon,t}}{\sigma^2_{it}} = 1 - R^2$. After rearranging the first equation, we get $R^2 = \frac{1}{1+e^{IdioVol}}$ (i). We then substitute (i) into the second equation and get $\frac{\sigma^2_{i\epsilon,t}}{\sigma^2_{it}} = \frac{e^{IdioVol}}{1+e^{IdioVol}}$.

Table 2 reports univariate statistics, including difference-in-means tests, for all the variables between family and non-family firms. All of the volatility variables for family firms are, on average, higher than those for non-family firms. Regarding leverage, we find that family firms use less debt in their capital structure (0.1697) than non-family firms (0.2033), which is consistent with Anderson and Reeb's (2003b) argument that in order to mitigate firm risk, family firms tend to avoid using debt financing, which has high default risk, but instead rely more on equity financing. The significantly higher market-to-book ratio for family firms indicates that the market considers family firms as being more profitable, a result which is in agreement with Anderson and Reeb's (2003a) finding. With respect to firm size, although family firms appear to be small relative to non-family firms, they are still of large size with a mean market capitalization of $10.89 billion compared with $11.48 billion for non-family firms. In addition, family firms demonstrate long-term business horizon, with an average firm age of 24 years relative to 30 years for non-family firms. Finally, the univariate analysis shows that family firms, on average, are less diversified than non-family firms, which is consistent with Anderson and Reeb's (2003b) finding.

[Insert Table 2 Here]

4.1.2 Variables Involved in Regression Analysis on the Comparison in Corporate Risk-taking between Family and Non-family firms[48]

Following John et al. (2008), we construct all the control variables, except earnings smoothing (*ES2*), as of the beginning year (i.e. 2003) of our sample period (2003-2007). For earnings smoothing (*ES2*), we construct the variable for every year within our sample period. Descriptive statistics for the *RISK1* measure and the independent variables are presented in Panel A and Panel B of Table 3 respectively.

[48] Following John et al. (2008), we winsorize extreme observations of the continuous variables at the 1st and 99th percentiles to avoid spurious inferences generated by the undue influence of outliers.

[Insert Table 3 Here]

The univariate statistics (Panel A of Table 4) demonstrate that family firms, on average, have a slightly higher level of risk-taking than non-family firms. Panel B of Table 4 indicates that family firms differ from non-family firms in terms of initial firm-level characteristics. Specifically, family firms, on average, are smaller (with lower initial firm size), exhibit better performance (with higher initial sales growth and higher initial corporate earnings), and use less debt in their capital structure (with lower initial book leverage), all of which are in line with findings reported in the above section and in previous studies. Particularly, we find that although the difference is not significant at conventional levels of significance, family firms have a lower level of earnings smoothing (*ES2*), suggesting that family firms are less involved in earnings management or manipulation than non-family firms.

[Insert Table 4 Here]

4.1.3 Variables Involved in Regression Analysis on the Comparison in Earnings Informativeness between Family and Non-family firms

Table 5 and Table 6 respectively present descriptive statistics and univariate statistics for all the variables involved in *RQ3*. In terms of 12-month cumulative return (RET), although family firms appear to perform better than non-family firms (0.1761 for non-family firms versus 0.1774 for family firms), the t-statistics for the difference-in-means tests indicate that the difference is not significant. The average scaled change-in-net-income (NI) is 0.0242 for non-family firms, whereas it is 0.0193 for family firms. With respect to risk for bankruptcy ($LOSS$),[49] family firms are as likely as non-family firms to report a loss. Compared with non-family firms, family firms, on average, exhibit better profitability (*ROA*: 0.0629 for family firms versus 0.0497 for non-family firms). Both the results and the implications of descriptive statistics and univariate statistics for firm size ($SIZE$), firm leverage (LEV), market-to-book ratio (MB), and firm age

[49] See Wang (2006) on page 631.

(AGE) are identical to those presented in Section 4.1.1.

[Insert Table 5 Here]

[Insert Table 6 Here]

4.2 Regression Results

4.2.1 Regression Analysis on the Comparison in Idiosyncratic Volatility between Family and Non-family Firms

Table 7 reports the estimates of equation (10) with the logistic transformed relative idiosyncratic volatility ($IdioVol$) as the dependent variable. We find that the coefficient on the family binary variable ($FamFirm$) is positive and significant. Thus, the evidence suggests that ceteris paribus, compared with non-family firms, family firms have higher idiosyncratic volatility, or alternatively, family firms have higher stock price informativeness. The results are also economically significant: after controlling for other firm-level characteristics, on average, relative idiosyncratic volatility ($IdioVol$) of family firms is about 0.0935 (9.35%) higher than that of non-family firms. The coefficients on most of the control variables are consistent with our expectations. Especially, the coefficient on earnings smoothing (*ES2*), an inverse index of accounting transparency, is negative, suggesting that firms with higher levels of accounting transparency demonstrate higher levels of idiosyncratic volatility (or stock price informativeness), a result that is consistent with the theoretical argument that higher quality accounting disclosure can encourage more intensive informed trading (i.e. the collection of private information), leading to higher firm specific variation and a more informative price (Durnev et al., 2004; Ferreira and Laux, 2007).

[Insert Table 7 Here]

4.2.2 Regression Analysis on the Comparison in Corporate Risk-taking between Family and Non-family Firms

Table 8 reports the estimates of equation (11) and (12) in which the corporate risk-taking proxy (*RISK1*) is the dependent variable. We first estimate equation (11) without including the family binary variable in it. In column (1), we find that the G-index (GOV) is significantly negatively associated with corporate risk-taking (*RISK1*), suggesting that firms with stronger firm-level shareholder protection (i.e. lower G-index or fewer governance provisions) demonstrate higher corporate risk-taking levels, a result that is in line with John et al.'s (2008) theoretical argument and empirical findings. Moreover, the economic impact of governance provisions on corporate risk-taking is also significant. A one standard deviation decrease in the G-index increases the corporate risk-taking proxy by 4.35% of its mean.[50]

We then estimate the full version of equation (11) to test whether family firms undertake more or fewer risks than non-family firms do. In column (2), we find that adding the family binary variable ($FamFirm$) does not change the negative sign, magnitude, and significance of the coefficient on G-index and that the coefficient on $FamFirm$ is significantly negative, indicating that family firms, on average, undertake fewer risks than non-family firms do. Specifically, ceteris paribus, the average corporate risk-taking level of family firms is 8.49% lower than that of non-family firms,[51] a result that is also economically significant.

In order to examine whether the impact of governance provisions on corporate risk-taking decisions is different between family and non-family firms, we estimate equation (12) in which the interaction term between GOV and $FamFirm$ ($GOV\_FamFirm$) is incorporated. In column (3), we find that for non-family firms ($FamFirm = 0$; $GOV\_FamFirm = 0$), the coefficient (α_1 = -0.0004) on GOV is still significantly negative (t-statistic = -3.96), which is

[50] $\frac{0.0002 \times 2.4159}{0.0111} \times 100\% = 4.35\%$

[51] $\frac{0.0009}{0.0106} \times 100\% = 8.49\%$

consistent with John et al.'s (2008) findings for general firms. However, interestingly, for family firms ($FamFirm = 1$; $GOV\_FamFirm = GOV$), the result indicates that governance provisions do not have any influence on their corporate risk-taking decisions. Specifically, the t-statistic for testing the null hypothesis that the sum of the coefficients on GOV and $GOV\_FamFirm$ equals zero (i.e. H_0: $\alpha_1 + \alpha_3 = 0$) is 0.0071 by which we cannot reject the null hypothesis.[52] One explanation for this result found is that in family firms, families' monitoring functions as the dominant corporate governance mechanism so that governance provisions, although being one of the common corporate governance mechanisms in non-family firms, are not effective any more or at least do not play a significant role in corporate risk-taking decisions. In fact, in family firms, families with even a small percentage of equity holdings would have significant power and influence on corporate decision making, thereby weakening or even completely eliminating the effects of governance provisions (Anderson and Reeb, 2003a; Wang, 2006; Chrisman et al., 2010).

The coefficients on most of the control variables are consistent with our expectations. Especially, the coefficient on earnings smoothing (*ES2*) is significantly negative, suggesting that firms with higher levels of earnings smoothing incentives undertake fewer risks (i.e. demonstrate lower volatility of corporate earnings). Firm size also has a significantly negative coefficient, indicating a negative relationship between firm size and operating risk. All of these results are in line with John et al.'s (2008) findings.

[Insert Table 8 Here]

4.2.3 Regression Analysis on the Comparison in Earnings Informativeness between Family and Non-family Firms

Table 9 reports the estimates of equation (13) in which the annual returns are regressed on

[52] $t = \frac{a_1+a_2-0}{\sqrt{\widehat{var}(a_1+a_2)}} = \frac{a_1+a_2}{\sqrt{\widehat{var}(a_1)+\widehat{var}(a_2)+2\times\widehat{cov}(a_1,a_2)}} = \frac{-0.00039577+0.00039714}{\sqrt{9.9891099\times10^{-9}+4.3932891\times10^{-8}+2\times(-8.467651\times10^{-9})}} = 0.0071$

the annual changes in net income. Equation (13) potentially suffers from an endogeneity issue. Specifically, a firm's stock return (RET) and the degree of risk-taking in its operation (*RISK1*) could be jointly impacted by its firm-level investor protection (GOV). Therefore, we use two-stage least-squares regressions to estimate equation (13), in which the estimation of equation (11) to get the fitted value of *RISK1* is the first stage.

We first estimate equation (13) without including those interaction terms except for $NI \times FamFirm$. In column (1), we find that the coefficients on both the annual change in net income (NI) and the test variable ($NI \times FamFirm$) are positive and significant, suggesting that the accounting earnings of family firms are more informative than those of non-family firms.

We then estimate the full version of equation (13), in which the main coefficient of interest is that of $NI \times FamFirm$. The result shows that the incorporation of those additional interaction variables, which are identified by previous studies as the determinants of ERC, does not change the positive sign and statistical significance of the coefficient on $NI \times FamFirm$. The coefficient on NI becomes insignificant because the incorporation of those additional explanatory interaction variables that involve NI may have controlled for most of the variation of NI and thereby lowered its explanatory power.

[Insert Table 9 Here]

Instead of controlling for firm operating risk in equation (13), we alternatively control for firm idiosyncratic risk (or stock price informativeness). Because a firm's stock return (RET) and idiosyncratic volatility could be jointly impacted by its firm-level shareholder protection (GOV), we again apply the two-stage least-squares estimation, in which the estimation of equation (10) to get the fitted value of $IdioVol$ is the first stage. Our results remain qualitatively similar under this alternative model specification. The coefficient on $NI \times FamFirm$ is positive and significant, suggesting that family firms report more informative earnings. Especially, the coefficient on the interaction term between earnings and idiosyncratic volatility ($NI \times IdioVol$) is significantly positive, indicating that ceteris paribus, the accounting earnings of those firms

that exhibit higher stock price informativeness are more indicative of the firms' stock returns. This result, to some extent, substantiates our findings on family firms' higher earnings informativeness as we previously find that family firms demonstrate higher stock price informativeness.

[Insert Table 10 Here]

5 Robustness Tests

5.1 Regression Analysis on the Comparison in Idiosyncratic Volatility between Family and Non-family Firms—Robustness Checks with Alternative Idiosyncratic Volatility Measures

The $IdioVol$ measure used in our main test (see Table 7) is the logistic transformed relative idiosyncratic volatility constructed by using weekly stock returns and the market model. For robustness, we alternatively construct the $IdioVol$ measure by using either the market model or the industry index model and either daily returns or weekly returns. In addition to the relative idiosyncratic volatility, the absolute idiosyncratic volatility is also used for the purpose of robustness check.[53] Overall, based on these different methods of construction, 7 alternative $IdioVol$ measures are created, and our results remain qualitatively similar. Specifically, in Table 11-1 and Table 11-2, among all of the 7 models, we consistently find that the coefficient on the family binary variable ($FamFirm$) is positive and significant, suggesting that ceteris paribus, compared with non-family firms, family firms have higher idiosyncratic volatility, or alternatively, family firms have higher stock price informativeness.

[Insert Table 11-1 Here]

[53] Like the relative idiosyncratic volatility, the absolute idiosyncratic volatility is constructed by using either the market model or the industry index model and either daily returns or weekly returns.

[Insert Table 11-2 Here]

5.2 Regression Analysis on the Comparison in Corporate Risk-taking between Family and Non-family Firms—Robustness Checks with Alternative Corporate Risk-taking Measures

The *RISK1* measure used in our main test (see Table 8) and analysis is constructed based on the two-digit SIC industry category and by using the most recent 20 quarters of data $(T = 20)$ under the condition that firms have earnings and total assets available for at least 20 quarters. For robustness, we alternatively construct the *RISK1* measure by using either the one-digit SIC industry category or the three-digit SIC industry category. In addition to using different methods of industry classification, the required amount of quarters of data to construct the *RISK1* measure is reduced to 12.[54] Overall, based on these different methods of construction, 5 alternative *RISK1* measures are created, and our results remain qualitatively similar. Specifically, in Table 12, among all of the 5 models, we find: (a) For non-family firms $(FamFirm = 0;\ GOV\_FamFirm = 0)$, the G-index is negatively associated with the corporate risk-taking proxy, suggesting that stronger firm-level shareholder protection (lower G-index) is associated with a higher level of risk-taking in corporate investment; (b) The sum of the coefficients on GOV and $GOV\_FamFirm$ is statistically equal to zero (the t-statistics are 0.2091, -0.5972, 0.5956, 0.4460, and -0.4240 respectively), indicating that for family firms $(FamFirm = 1;\ GOV\_FamFirm = GOV)$, governance provisions do not have any influence on their corporate risk-taking decisions; (c) The coefficient on $FamFirm$ is significantly negative, suggesting that family firms, on average, undertakes fewer risks than non-family firms do. All of these results are qualitatively identical to those reported in the main test presented in Table 8.

[54] In this case, firms should have earnings and total assets available for at least 12 quarters.

[Insert Table 12 Here]

5.3 Regression Analysis on the Comparison in Earnings Informativeness between Family and Non-family Firms—Robustness Checks with Alternative Corporate Risk-taking or Idiosyncratic Volatility Measures as Control Variables

5.3.1 Alternative Corporate Risk-taking Measures

Because we control for firm operating risk in equation (13), we then examine whether using the 5 alternative *RISK1* measures would affect our results. In Table 13, the results among all of the 5 models show that when we only test for differential informativeness of earnings conditional on family presence, the coefficient on our test variable $NI \times FamFirm$ is positive and significant and that when other interaction variables are incorporated, the coefficient on $NI \times FamFirm$ remains significantly positive, all of which suggest that the accounting earnings of family firms exhibit more explanatory power for stock returns than those of non-family firms. In particular, the coefficient on the interaction term between NI and the $RISK1$ measure is significantly positive consistently across the 5 models, suggesting that firms with higher levels of risk-taking in corporate investment report more informative earnings.

[Insert Table 13 Here]

5.3.2 Alternative Idiosyncratic Volatility Measures

When we control for firm idiosyncratic risk in equation (13), it is constructed based on weekly stock returns and the market model, which is a regular practice in the literature. For robustness, we alternatively use other stock price informativeness proxies constructed by using daily returns or the industry index model. In Table 14-2, our corollary that firms with higher

stock price informativeness also demonstrate higher earnings informativeness is substantiated when the absolute idiosyncratic volatility ($IdioVol\_A5$), instead of the relative idiosyncratic volatility ($IdioVol$) as applied in our main test, is utilized. In particular, across all of the 7 models in Table 14-1 and Table 14-2, the coefficients on the interaction terms between NI and $FamFirm$ are consistently positive and significant, further corroborating our findings in the main test that the accounting earnings of family firms are more informative than those of non-family firms.

[Insert Table 14-1 Here]

[Insert Table 14-2 Here]

6 Conclusion

Our study aims to investigate two controversies in the family business literature: whether family firms undertake fewer or more risks than non-family firms do, and whether family firms exhibit higher or lower information flow, reflected in their stock price informativeness and earnings informativeness, to the market. Using a sample of the S&P 500 companies as of 2003 for the period 2003-2007, we find that compared with non-family firms, the stock prices of family firms have more firm specific information impounded and the accounting earnings of family firms are more informative and thereby have more explanatory power for stock returns. These results are robust to different model specifications and variable proxies. In terms of risk-taking levels in corporate investment, our results indicate that family firms, on average, undertake fewer risks than non-family firms do. In particular, we find that although G-index is negatively associated with corporate risk-taking in non-family firms as John et al. (2008) find for general firms, governance provisions do not have any influence on corporate risk-taking decisions in family firms. Numerous additional sensitivity tests using different corporate risk-taking proxies confirm the robustness of the findings.

Our study contributes to the literature in several ways. To the best of our knowledge, this is the first study in the literature that empirically examines family firms' risk-taking propensity relative to that of non-family firms, although a few different theoretical arguments about this controversy exist in the literature. Moreover, our study extends and complements John et al.'s (2008) findings for general firms by examining whether governance provisions affect corporate risk-taking decisions differently between family and non-family firms. Finally, our findings add to the extant literature on family firms' earnings informativeness relative to that of non-family firms on which there is neither theoretical nor empirical consensus.

Our study applies agency theory and corporate governance perspectives to investigate the differences between family and nonfamily firms in terms of corporate risk-taking propensity and information flow to the market, which can facilitate research scholars in this area, investment practitioners, and family businesses themselves to better understand the idiosyncrasies of family ownership and control, an ownership and organizational structure that is prevalent in the U.S. and even around the world. However, this study does have limitations. First, since only publicly traded firms with relatively large size (S&P 500) are investigated, our findings may not apply to smaller publicly traded firms and private firms in which family involvement is even more dominant. Miller et al. (2007, p. 829) document that research findings from empirical studies on family businesses are highly sensitive both to the way by which family firms are defined and identified and to the nature of the sample (or the source of the data). Second, in our study, the comparison is focused between the U.S. family and non-family firms, suggesting that our results may not extend to firms in other countries. Legal systems and the quality and intensity of the enforcement of legal rules are considerably different across countries. For instance, outside the U.S., legal institutions and mechanisms that are designed to protect minority shareholders' rights may be weak or even nonexistent. Under this circumstance, the relative severity among different agency problems and thereby the differences in corporate risk-taking levels and information flow to the market between family and non-family firms may be different across countries. These

limitations may constitute potential avenues for future research.

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Table 1: Descriptive Statistics for Variables Involved in Regression Analysis on the Comparison in Idiosyncratic Volatility between Family and Non-family Firms

Panel A reports descriptive statistics for the volatility variables, $IdioVol$ and $SysRisk$, over our sample period (2003—2007). We construct each of these volatility variables for each sample year t, generating 2327 firm-year observations. $IdioVol$ is the logistic transformed relative idiosyncratic volatility constructed by using weekly stock returns and the market model; $SysRisk$ is the natural logarithm of systematic risk constructed by using weekly stock returns and the market model. Panel B reports descriptive statistics for the independent variables. Please refer to Appendix A for variable definitions.

Variable		Mean	Median	STDEV	N	Minimum	Maximum
Panel A: Volatility Variables							
IdioVol	*IdioVol*	1.1550	1.0284	1.0689	2327	-0.8578	5.4017
SysRisk	*SysRisk*	-8.2893	-8.2440	1.1629	2327	-12.3710	-5.7669
Panel B: Independent Variables							
Governance index (i.e. G-index)	*GOV*	9.7440	10.0000	2.4159	2363	3.0000	16.0000
Return-on-equity	*ROE*	0.1663	0.1502	0.2879	2351	-1.0007	1.7380
Volatility of return-on-equity	*VROE*	0.0132	0.0003	0.0704	2281	0.0000	0.6300
Leverage	*LEV*	0.1917	0.1670	0.1467	2343	0.0000	0.6399
Market-to-book	*M/B*	1.1086	1.0505	0.6428	2111	-0.1610	3.3626
Market capitalization	*SIZE*	9.3301	9.2755	1.1449	2162	6.7773	12.3151
Dividend dummy	*DD*	0.6724	1.0000	0.4694	2500	0.0000	1.0000
Firm age	*AGE*	3.3403	3.4965	0.7592	2488	1.3652	4.4248
Diversification dummy	*DIVER*	0.7359	1.0000	0.4410	1795	0.0000	1.0000
Earnings smoothing	*ES2*	0.1727	0.2413	0.4858	1827	-1.6340	0.9025

Table 2: Univariate Statistics for Variables Involved in Regression Analysis on the Comparison in Idiosyncratic Volatility between Family and Non-family Firms

This table reports univariate statistics, including difference-in-means tests, for all the variables between family and non-family firms. Please refer to Appendix A and Table 1 for variable definitions. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

Variable	Firm Type	N	Mean	STDEV	Difference (t-statistics)
Panel A: Volatility Variables					
IdioVol	Non-family Firm	1516	1.1130	1.0644	-0.1205***
	Family Firm	811	1.2335	1.0735	(-2.59)
SysRisk	Non-family Firm	1516	-8.3458	1.1318	-0.1622***
	Family Firm	811	-8.1836	1.2126	(-3.15)
Panel B: Independent Variables					
GOV	Non-family Firm	1514	9.9432	2.3389	0.5545***
	Family Firm	849	9.3887	2.5098	(5.28)
ROE	Non-family Firm	1530	0.1685	0.2995	0.0063
	Family Firm	821	0.1622	0.2651	(-0.52)
VROE	Non-family Firm	1475	0.0148	0.0772	0.0046
	Family Firm	806	0.0102	0.0558	(1.63)
LEV	Non-family Firm	1529	0.2033	0.1421	0.0336***
	Family Firm	814	0.1697	0.1526	(5.20)
M/B	Non-family Firm	1369	1.0466	0.6479	-0.1765***
	Family Firm	742	1.2231	0.6175	(-6.07)
SIZE	Non-family Firm	1410	9.3483	1.1873	0.0524
	Family Firm	752	9.2959	1.0608	(1.05)
DD	Non-family Firm	1615	0.7152	0.4515	0.1208***
	Family Firm	885	0.5944	0.4913	(6.20)
AGE	Non-family Firm	1607	3.4311	0.7864	0.2563***
	Family Firm	881	3.1747	0.6766	(8.16)
DIVER	Non-family Firm	1131	0.7622	0.4620	0.0709***
	Family Firm	664	0.6913	0.4623	(3.30)
ES2	Non-family Firm	1146	0.1836	0.4940	0.0292
	Family Firm	681	0.1544	0.4716	(1.24)

Table 3: Descriptive Statistics for Variables Involved in Regression Analysis on the Comparison in Corporate Risk-taking between Family and Non-family firms

Panel A reports descriptive statistics for the *RISK1* measure over our sample period (2003—2007). *RISK1* is the industry-adjusted volatility of corporate earnings, constructed based on the two-digit SIC industry category and by using the most recent 20 quarters of data $(T = 20)$ under the condition that firms have earnings and total assets available for at least 20 quarters. Panel B reports descriptive statistics for the independent variables. Please refer to Appendix B for variable definitions.

Variable		Mean	Median	STDEV	N	Minimum	Maximum
Panel A: Dependent Variable							
Corporate risk-taking proxy	*RISK1*	0.0111	0.0088	0.0086	2076	0.0007	0.0476
Panel B: Independent Variables							
Governance index (i.e. G-index)	*GOV*	9.7440	10.0000	2.4159	2363	3.0000	16.0000
Initial sales growth	*InitialSalesGrowth*	0.1042	0.0869	0.1102	2435	-0.1239	0.5640
Initial book leverage	*InitialBookLeverage*	0.6517	0.6666	0.2274	2060	0.1406	1.0681
Initial firm size	*LogInitialFirmSize*	9.3410	9.2690	1.4317	2490	6.7790	13.5096
Initial corporate earnings	*InitialCorporateEarnings*	0.1217	0.1130	0.0773	2440	-0.0455	0.3314
Earnings smoothing	*ES2*	0.1727	0.2413	0.4858	1827	-1.6340	0.9025

Table 4: Univariate Statistics for Variables Involved in Regression Analysis on the Comparison in Corporate Risk-taking between Family and Non-family firms

This table reports univariate statistics, including difference-in-means tests, for all the variables between family and non-family firms. *RISK1* is the industry-adjusted volatility of corporate earnings, constructed based on the two-digit SIC industry category and by using the most recent 20 quarters of data $(T = 20)$ under the condition that firms have earnings and total assets available for at least 20 quarters. For information about the independent variables, please refer to Appendix B for variable definitions. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

Variable	Firm Type	N	Mean	STDEV	Difference (t-statistics)
Panel A: Dependent Variable					
RISK1	Non-family Firm	1369	0.0106	0.0084	-0.0017***
	Family Firm	707	0.0123	0.0088	(-4.33)
Panel B: Independent Variables					
GOV	Non-family Firm	1514	9.9432	2.3389	0.5545***
	Family Firm	849	9.3887	2.5098	(5.28)
InitialSalesGrowth	Non-family Firm	1575	0.0988	0.1089	-0.0153***
	Family Firm	860	0.1141	0.1122	(-3.28)
InitialBookLeverage	Non-family Firm	1315	0.6984	0.2147	0.1293***
	Family Firm	745	0.5691	0.2258	(12.89)
LogInitialFirmSize	Non-family Firm	1615	9.5649	1.5146	0.6371***
	Family Firm	875	8.9278	1.1565	(11.73)
InitialCorporateEarnings	Non-family Firm	1590	0.1168	0.0763	-0.0139***
	Family Firm	850	0.1308	0.0785	(-4.25)
ES2	Non-family Firm	1146	0.1836	0.4940	0.0292
	Family Firm	681	0.1544	0.4716	(1.24)

Table 5: Descriptive Statistics for Variables Involved in Regression Analysis on the Comparison in Earnings Informativeness between Family and Non-family firms

This table presents descriptive statistics for all the variables involved in *RQ3*. RET is 12-month cumulative raw return ending three months after the fiscal year-end at t. Since a firm's stock return (RET) and the degree of risk-taking in its operation (*RISK1*) could be jointly impacted by its firm-level investor protection (GOV), we use two-stage least-squares regressions to estimate equation (13), in which the estimation of equation (11) to get the fitted value of *RISK1* (*RISK1Fit*) is the first stage. For information about other variables, please refer to Appendix C for variable definitions.

Variable		Mean	Median	STDEV	N	Minimum	Maximum
12-month cumulative return	*RET*	0.1766	0.1322	0.3667	2345	-0.6465	1.5606
Scaled change-in-net-income	*NI*	0.0225	0.0076	0.1257	2187	-0.4324	0.8014
Firm size	*SIZE*	9.3301	9.2755	1.1449	2162	6.7773	12.3151
Firm leverage	*LEV*	0.1917	0.1670	0.1467	2343	0.0000	0.6399
Market-to-book	*MB*	1.1086	1.0505	0.6428	2111	-0.1610	3.3626
Firm age	*AGE*	3.3403	3.4965	0.7592	2488	1.3652	4.4248
Loss dummy	*LOSS*	0.0974	0.0000	0.2966	2351	0.0000	1.0000
RISK1Fit	*RISK1Fit*	0.0122	0.0121	0.0041	1521	0.0007	0.0266
Return-on-assets	*ROA*	0.0543	0.0497	0.0667	2351	-0.2384	0.2264

Table 6: Univariate Statistics for Variables Involved in Regression Analysis on the Comparison in Earnings Informativeness between Family and Non-family firms

This table reports univariate statistics, including difference-in-means tests, for all the variables between family and non-family firms. *RET* is 12-month cumulative raw return ending three months after the fiscal year-end at t. *RISK1Fit* is the fitted value of *RISK1* obtained from equation (11). For information about other variables, please refer to Appendix C for variable definitions. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

Variable	Firm Type	N	Mean	STDEV	Difference (t-statistics)
RET	Non-family Firm	1526	0.1761	0.3557	-0.0013
	Family Firm	819	0.1774	0.3865	(-0.08)
NI	Non-family Firm	1422	0.0242	0.1316	0.0050
	Family Firm	765	0.0193	0.1137	(0.92)
SIZE	Non-family Firm	1410	9.3483	1.1873	0.0524
	Family Firm	752	9.2959	1.0608	(1.05)
LEV	Non-family Firm	1529	0.2033	0.1421	0.0336***
	Family Firm	814	0.1697	0.1526	(5.20)
MB	Non-family Firm	1369	1.0466	0.6479	-0.1765***
	Family Firm	742	1.2231	0.6175	(-6.07)
AGE	Non-family Firm	1607	3.4311	0.7864	0.2563***
	Family Firm	881	3.1747	0.6766	(8.16)
LOSS	Non-family Firm	1530	0.0974	0.2966	-0.0001
	Family Firm	821	0.0974	0.2967	(-0.00)
RISK1Fit	Non-family Firm	949	0.0118	0.0042	-0.0010***
	Family Firm	572	0.0128	0.0038	(-4.60)
ROA	Non-family Firm	1530	0.0497	0.0654	-0.0132***
	Family Firm	821	0.0629	0.0682	(-4.60)

Table 7: Regression Analysis on the Comparison in *Relative* Idiosyncratic Volatility between Family and Non-family Firms

This table reports the estimates of equation (10) with the logistic transformed relative idiosyncratic volatility ($IdioVol$) as the dependent variable. $IdioVol$ is the logistic transformed relative idiosyncratic volatility constructed by using weekly stock returns and the market model; $FamFirm$ is a binary variable that is equal to one when the firm is a family firm as identified by Business Week (2003), and zero otherwise; control variables include GOV—the IRRC governance index constructed by Gompers et al. (2003), profitability (ROE), profitability volatility ($VROE$), leverage (LEV), market to book ratio (M/B), market capitalization ($SIZE$), dividend dummy (DD), firm age (AGE), diversification dummy ($DIVER$), earnings smoothing ($ES2$), and systematic risk ($SysRisk$). Please refer to Appendix A for variable definitions. Regressions include two-digit SIC industry fixed effects and year fixed effects. The sample period is from 2003 to 2007. All continuous variables are winsorized at the 1st and 99th percentiles. Robust t-statistics based on robust standard errors are reported in parentheses below the coefficient estimates. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

	IdioVol
FamFirm	0.0935**
	(2.31)
GOV	-0.0029
	(-0.38)
ROE	-0.5715***
	(-5.68)
VROE	1.4071***
	(3.56)
LEV	-0.3235*
	(-1.74)
M/B	0.0832*
	(1.86)
SIZE	-0.1260***
	(-6.55)
DD	-0.3369***
	(-5.32)
AGE	-0.1173***
	(-4.16)
DIVER	-0.0200
	(-0.42)
SysRisk	-0.8452***
	(-36.83)
ES2	-0.0174
	(-0.95)
Intercept	-3.9520***
	(-15.46)
N	1100
Ajusted R^2	0.7206
Industry Effects	Yes
Year Effects	Yes

Table 8: Regression Analysis on the Comparison in Corporate Risk-taking between Family and Non-family Firms

This table reports the estimates of equation (11) and (12) in which the corporate risk-taking proxy (*RISK1*) is the dependent variable (In column (1), we first estimate equation (11) without including the family binary variable in it). *RISK1* is the industry-adjusted volatility of corporate earnings, constructed based on the two-digit SIC industry category and by using the most recent 20 quarters of data ($T = 20$) under the condition that firms have earnings and total assets available for at least 20 quarters; GOV is the IRRC governance index constructed by Gompers et al. (2003); $FamFirm$ is a binary variable that is equal to one when the firm is a family firm as identified by Business Week (2003), and zero otherwise; control variables for fundamental firm-level characteristics include initial firm size ($LogInitialFirmSize$), initial book leverage ($InitialBookLeverage$), initial sales growth ($InitialSalesGrowth$), initial corporate earnings ($InitialCorporateEarnings$), and earnings smoothing ($ES2$). Please refer to Appendix B for variable definitions. Regressions include two-digit SIC industry fixed effects and year fixed effects. The sample period is from 2003 to 2007. All continuous variables are winsorized at the 1st and 99th percentiles. Robust t-statistics based on robust standard errors are reported in parentheses below the coefficient estimates. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

	RISK1		
	(1)	(2)	(3)
GOV	-0.0002**	-0.0002**	-0.0004***
	(-2.42)	(-2.48)	(-3.96)
FamFirm		-0.0009*	-0.0047**
		(-1.79)	(-2.23)
GOV_FamFirm			0.0004*
			(1.89)
InitialSalesGrowth	-0.0024	-0.0020	-0.0023
	(-1.10)	(-0.91)	(-1.07)
InitialBookLeverage	-0.0024	-0.0027*	-0.0026*
	(-1.53)	(-1.74)	(-1.69)
LogInitialFirmSize	-0.0015***	-0.0015***	-0.0016***
	(-6.38)	(-6.57)	(-6.81)
InitialCorporateEarnings	0.0040	0.0041	0.0037
	(1.09)	(1.12)	(1.03)
ES2	-0.0027***	-0.0027***	-0.0026***
	(-5.34)	(-5.36)	(-5.21)
Intercept	0.0315***	0.0324***	0.0343***
	(11.89)	(12.25)	(12.93)
N	1420	1420	1420
Ajusted R^2	0.1971	0.1985	0.2006
Industry Effects	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes

Table 9: Regression Analysis on the Comparison in Earnings Informativeness between Family and Non-family Firms (Controlling for Firm Operating Risk)

This table reports the estimates of equation (13) in which the annual returns are regressed on the annual changes in net income (In column (1), we first estimate equation (13) without including those interaction terms except for $NI \times FamFirm.$). Equation (13) potentially suffers from an endogeneity issue. Specifically, a firm's stock return (RET) and the degree of risk-taking in its operation (*RISK1*) could be jointly impacted by its firm-level investor protection (GOV). Therefore, we use two-stage least-squares regressions to estimate equation (13), in which the estimation of equation (11) to get the fitted value of *RISK1* is the first stage. RET is 12-month cumulative raw return ending three months after the fiscal year-end at t; NI is the scaled change in net income; $FamFirm$ is a binary variable that is equal to one when the firm is a family firm as identified by Business Week (2003), and zero otherwise; other independent variables include firm size ($SIZE$), firm leverage (LEV), firm age (AGE), market-to-book ratio (MB), return on assets (ROA), loss dummy ($LOSS$), and the interaction terms between NI and all of these separate variables including $FamFirm$. Please refer to Appendix C for variable definitions. Regressions include two-digit SIC industry fixed effects. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

Table 9: Regression Analysis on the Comparison in Earnings Informativeness between Family and Non-family Firms (Controlling for Firm Operating Risk)

	RET (1)	RET (2)
NI	0.7337***	-0.1767
	(6.66)	(-0.18)
NI×FamFirm	0.5660***	0.6474***
	(2.67)	(2.95)
NI×RISK1		22.0385**
		(2.35)
NI×SIZE		-0.0551
		(-0.62)
NI×LEV		-2.1051***
		(-2.97)
NI×MB		-0.3386**
		(-2.45)
NI×AGE		0.5642***
		(4.73)
NI×LOSS		-0.0166
		(-0.06)
NI×ROA		-0.5649
		(-0.39)
FamFirm	0.0194	0.0165
	(0.94)	(0.81)
RISK1Fit	-4.1769	-4.9913
	(-0.76)	(-0.91)
SIZE	-0.0034	-0.0049
	(-0.31)	(-0.44)
LEV	-0.0941	-0.0837
	(-1.00)	(-0.89)
MB	0.0938***	0.1055***
	(5.02)	(5.60)
AGE	-0.0006	-0.0059
	(-0.04)	(-0.43)
LOSS	-0.0632	-0.0616
	(-1.51)	(-1.48)
ROA	-0.6645***	-0.7922***
	(-2.82)	(-3.35)
Intercept	0.1692	0.2092
	(1.00)	(1.25)
N	1358	1358
Ajusted R^2	0.1150	0.1344
Industry Effects	Yes	Yes
Year Effects	No	No

Table 10: Regression Analysis on the Comparison in Earnings Informativeness between Family and Non-family Firms (Controlling for Firm Idiosyncratic Risk)

This table reports the estimates of equation (13) in which the annual returns are regressed on the annual changes in net income (In column (1), we first estimate equation (13) without including those interaction terms except for $NI \times FamFirm$.). Instead of controlling for firm operating risk in equation (13) as presented in Table 9, we alternatively control for firm idiosyncratic risk (or stock price informativeness). However, a firm's stock return (RET) and idiosyncratic volatility could be jointly impacted by its firm-level investor protection (GOV). Therefore, we use two-stage least-squares regressions to estimate equation (13), in which the estimation of equation (10) to get the fitted value of $IdioVol$ is the first stage. RET is 12-month cumulative raw return ending three months after the fiscal year-end at t; NI is the scaled change in net income; $FamFirm$ is a binary variable that is equal to one when the firm is a family firm as identified by Business Week (2003), and zero otherwise; other independent variables include firm size $(SIZE)$, firm leverage (LEV), firm age (AGE), market-to-book ratio (MB), return on assets (ROA), loss dummy $(LOSS)$, and the interaction terms between NI and all of these separate variables including $FamFirm$. Please refer to Appendix C for variable definitions. Regressions include two-digit SIC industry fixed effects. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

Table 10: Regression Analysis on the Comparison in Earnings Informativeness between Family and Non-family Firms (Controlling for Firm Idiosyncratic Risk)

	RET (1)	RET (2)
NI	0.5801***	-1.4623
	(3.58)	(-1.11)
NI×FamFirm	0.9417***	1.0937***
	(3.70)	(3.84)
NI×IdioVol		0.2270*
		(1.72)
NI×SIZE		0.0912
		(0.68)
NI×LEV		-1.2148
		(-1.28)
NI×MB		0.4022*
		(1.76)
NI×AGE		0.3198*
		(1.81)
NI×LOSS		-0.3270
		(-0.85)
NI×ROA		-0.5036
		(-0.32)
FamFirm	0.0123	0.0085
	(0.67)	(0.46)
IdioVolFit	0.0432***	0.0416***
	(4.26)	(4.11)
SIZE	0.0023	0.0021
	(0.25)	(0.23)
LEV	-0.1116	-0.1223
	(-1.34)	(-1.47)
MB	0.0715***	0.0727***
	(3.85)	(3.88)
AGE	0.0150	0.0131
	(1.23)	(1.06)
LOSS	-0.1542***	-0.1546***
	(-3.81)	(-3.81)
ROA	-0.2956	-0.3658
	(-1.35)	(-1.64)
Intercept	-0.0752	-0.0587
	(-0.83)	(-0.65)
N	1087	1087
Ajusted R^2	0.1884	0.1954
Industry Effects	Yes	Yes
Year Effects	No	No

Table 11-1: Regression Analysis on the Comparison in Idiosyncratic Volatility between Family and Non-family Firms—Robustness Checks with Alternative Measures of *Relative* Idiosyncratic Volatility

This table reports the estimates of equation (10) with the logistic transformed relative idiosyncratic volatility ($IdioVol$) as the dependent variable. $IdioVol\_A1$ is the logistic transformed relative idiosyncratic volatility constructed by using daily stock returns and the market model; $IdioVol\_A2$ is the logistic transformed relative idiosyncratic volatility constructed by using daily stock returns and the industry index model; $IdioVol\_A3$ is the logistic transformed relative idiosyncratic volatility constructed by using weekly stock returns and the industry index model; $FamFirm$ is a binary variable that is equal to one when the firm is a family firm as identified by Business Week (2003), and zero otherwise; control variables include GOV—the IRRC governance index constructed by Gompers et al. (2003), profitability (ROE), profitability volatility ($VROE$), leverage (LEV), market to book ratio (M/B), market capitalization ($SIZE$), dividend dummy (DD), firm age (AGE), diversification dummy ($DIVER$), earnings smoothing ($ES2$), and systematic risk ($SysRisk$) ($SysRisk$ in each column refers to $SysRisk\_A1$, $SysRisk\_A2$, and $SysRisk\_A3$ respectively). Please refer to Appendix A for variable definitions. Regressions include two-digit SIC industry fixed effects and year fixed effects. The sample period is from 2003 to 2007. All continuous variables are winsorized at the 1st and 99th percentiles. Robust t-statistics based on robust standard errors are reported in parentheses below the coefficient estimates. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

	IdioVol_A1 (1)	IdioVol_A2 (2)	IdioVol_A3 (3)
FamFirm	0.0646**	0.1435**	0.1436*
	(1.98)	(2.03)	(1.93)
GOV	0.0007	-0.0131	-0.0103
	(0.11)	(-0.67)	(-0.52)
ROE	-0.4328***	-0.6888***	-0.7799***
	(-5.31)	(-3.70)	(-3.98)
VROE	1.1341***	2.0531***	2.3717***
	(3.56)	(3.70)	(4.06)
LEV	0.0058	-0.2106	-0.2772
	(0.04)	(-0.55)	(-0.69)
M/B	0.0373	0.1321	0.1311
	(1.01)	(1.58)	(1.55)
SIZE	-0.1296***	-0.4216***	-0.4076***
	(-7.97)	(-8.82)	(-8.27)
DD	-0.3375***	-0.3813***	-0.3494***
	(-9.08)	(-4.08)	(-3.58)
AGE	-0.1121***	-0.2078***	-0.2369***
	(-4.61)	(-3.22)	(-3.52)
DIVER	-0.0202	0.1946**	0.2481**
	(0.51)	(1.99)	(2.39)
SysRisk	-0.7106***	-1.1113***	-1.0623***
	(-28.14)	(-17.80)	(-19.30)
ES2	-0.0238	-0.1931***	-0.1778***
	(-1.63)	(-3.57)	(-3.13)
Intercept	-3.8634***	-5.7390***	-3.8391***
	(-13.71)	(-6.50)	(13.45)
N	1100	921	921
Ajusted R^2	0.5928	0.5292	0.5394
Industry Effects	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes

Table 11-2: Regression Analysis on the Comparison in Idiosyncratic Volatility between Family and Non-family Firms—Robustness Checks with Alternative Measures of *Absolute* Idiosyncratic Volatility

This table reports the estimates of equation (10) with the natural logarithm of absolute idiosyncratic volatility ($ln(\sigma_{i\epsilon}^2)$) as the dependent variable. $IdioVol\_A4$ is the natural logarithm of absolute idiosyncratic volatility constructed by using daily stock returns and the market model; $IdioVol\_A5$ is the natural logarithm of absolute idiosyncratic volatility constructed by using weekly stock returns and the market model; $IdioVol\_A6$ is the natural logarithm of absolute idiosyncratic volatility constructed by using daily stock returns and the industry index model; $IdioVol\_A7$ is the natural logarithm of absolute idiosyncratic volatility constructed by using weekly stock returns and the industry index model; $FamFirm$ is a binary variable that is equal to one when the firm is a family firm as identified by Business Week (2003), and zero otherwise; control variables include GOV—the IRRC governance index constructed by Gompers et al. (2003), profitability (ROE), profitability volatility ($VROE$), leverage (LEV), market to book ratio (M/B), market capitalization ($SIZE$), dividend dummy (DD), firm age (AGE), diversification dummy ($DIVER$), earnings smoothing ($ES2$), and systematic risk ($SysRisk$) ($SysRisk$ in each column refers to $SysRisk\_A4$, $SysRisk\_A5$, $SysRisk\_A6$, and $SysRisk\_A7$ respectively). Please refer to Appendix A for variable definitions. Regressions include two-digit SIC industry fixed effects and year fixed effects. The sample period is from 2003 to 2007. All continuous variables are winsorized at the 1st and 99th percentiles. Robust t-statistics based on robust standard errors are reported in parentheses below the coefficient estimates. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

	IdioVol_A4 (1)	IdioVol_A5 (2)	IdioVol_A6 (3)	IdioVol_A7 (4)
FamFirm	0.0483	0.0877**	0.01445*	0.1718**
	(1.53)	(2.30)	(1.81)	(2.08)
GOV	0.0003	-0.0036	-0.0122	-0.0146
	(0.05)	(-0.49)	(-0.63)	(-0.74)
ROE	-0.4258***	-0.5168***	-0.7812***	-0.8866***
	(-5.61)	(-6.20)	(-4.21)	(-4.59)
VROE	1.0482***	1.2000***	2.5028***	2.7732***
	(3.54)	(3.83)	(4.46)	(4.79)
LEV	0.0105	-0.3170*	-0.5944**	-0.6422**
	(0.08)	(-1.89)	(-1.99)	(-2.07)
M/B	0.0467	0.0734*	0.0965	0.1149
	(1.33)	(1.72)	(1.18)	(1.36)
SIZE	-0.1281***	-0.1312***	-0.4322***	-0.4176***
	(-7.91)	(-6.74)	(-8.87)	(-8.42)
DD	-0.3283***	-0.3043***	-0.4973***	-0.4780***
	(-8.99)	(-7.11)	(-5.42)	(-5.04)
AGE	-0.1128***	-0.1199***	-0.2286***	-0.2564***
	(-4.80)	(-4.48)	(-3.24)	(3.57)
DIVER	-0.0094	0.0308	0.0889	0.1235
	(-0.25)	(0.67)	(0.65)	(1.15)
SysRisk	0.2990***	0.1431***	-0.0036	-0.0067
	(12.07)	(6.28)	(-0.06)	(-0.13)
ES2	-0.0220	-0.0197	-0.2126***	-0.1968***
	(-1.49)	(-1.11)	(-3.42)	(-3.09)
Intercept	-3.7970***	-3.9834***	-4.1733***	-2.7972***
	(-13.90)	(-16.96)	(-5.96)	(-4.37)
N	1100	1100	921	921
Ajusted R^2	0.6049	0.5054	0.2334	0.2243
Industry Effects	Yes	Yes	No	No
Year Effects	Yes	Yes	Yes	Yes

Table 12: Regression Analysis on the Comparison in Corporate Risk-taking between Family and Non-family Firms—Robustness Checks with Alternative Corporate Risk-taking Measures

This table reports the estimates of equation (11) and (12) in which the corporate risk-taking proxy (*RISK1*) is the dependent variable. The *RISK1* measure used in our main test (see Table 8) and analysis is constructed based on the two-digit SIC industry category and by using the most recent 20 quarters of data $(T = 20)$ under the condition that firms have earnings and total assets available for at least 20 quarters. For the purpose of robustness check, we alternatively construct the *RISK1* measure by using either the one-digit SIC industry category or the three-digit SIC industry category. In addition to using different methods of industry classification, the required amount of quarters of data to construct the *RISK1* measure is reduced to 12. Overall, based on these different methods of construction, 5 alternative *RISK1* measures are created: *RISK1_A1* is the industry-adjusted volatility of corporate earnings, constructed based on the one-digit SIC industry category and by using the most recent 12 quarters of data $(T = 12)$ under the condition that firms have earnings and total assets available for at least 12 quarters; *RISK1_A2* is the industry-adjusted volatility of corporate earnings, constructed based on the one-digit SIC industry category and by using the most recent 20 quarters of data $(T = 20)$ under the condition that firms have earnings and total assets available for at least 20 quarters; *RISK1_A3* is the industry-adjusted volatility of corporate earnings, constructed based on the two-digit SIC industry category and by using the most recent 12 quarters of data $(T = 12)$ under the condition that firms have earnings and total assets available for at least 12 quarters; *RISK1_A4* is the industry-adjusted volatility of corporate earnings, constructed based on the three-digit SIC industry category and by using the most recent 12 quarters of data $(T = 12)$ under the condition that firms have earnings and total assets available for at least 12 quarters; *RISK1_A5* is the industry-adjusted volatility of corporate earnings, constructed based on the three-digit SIC industry category and by using the most recent 20 quarters of data $(T = 20)$ under the condition that firms have earnings and total assets available for at least 20 quarters. GOV is the IRRC governance index constructed by Gompers et al. (2003); $FamFirm$ is a binary variable that is equal to one when the firm is a family firm as identified by Business Week (2003), and zero otherwise; control variables for fundamental firm-level characteristics include initial firm size $(LogInitialFirmSize)$, initial book leverage $(InitialBookLeverage)$, initial sales growth $(InitialSalesGrowth)$, initial corporate earnings $(InitialCorporateEarnings)$, and earnings smoothing $(ES2)$. Please refer to Appendix B for variable definitions. Regressions include two-digit SIC industry fixed effects and year fixed effects. The sample period is from 2003 to 2007. All continuous variables are winsorized at the 1st and 99th percentiles. Robust t-statistics based on robust standard errors are reported in parentheses below the coefficient estimates. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

Table 12: Regression Analysis on the Comparison in Corporate Risk-taking between Family and Non-family Firms—Robustness Checks with Alternative Corporate Risk-taking Measures

	RISK1_A1	RISK1_A2	RISK1_A3	RISK1_A4	RISK1_A5
	(1)	(2)	(3)	(4)	(5)
GOV	-0.0005***	-0.0005***	-0.0004***	-0.0005***	-0.0005***
	(-5.85)	(-5.37)	(-5.43)	(-6.29)	(-5.45)
FamFirm	-0.0047**	-0.0044**	-0.0052***	-0.0050***	-0.0040**
	(-2.43)	(-2.03)	(-2.73)	(-2.78)	(-2.06)
GOV_FamFirm	0.0005***	0.0004**	0.0005***	0.0005***	0.0004**
	(2.72)	(2.02)	(2.77)	(2.98)	(2.14)
InitialSalesGrowth	-0.0015	0.0009	-0.0052***	-0.0052***	-0.0027
	(-0.62)	(0.38)	(-2.65)	(-3.08)	(-1.48)
InitialBookLeverage	0.0010	-0.0008	-0.0019	-0.0023**	-0.0039***
	(0.70)	(-0.50)	(-1.37)	(-2.13)	(-3.23)
LogInitialFirmSize	-0.0017***	-0.0017***	-0.0016***	-0.0016***	-0.0014***
	(-8.53)	(-7.11)	(-8.36)	(-10.11)	(-7.55)
InitialCorporateEarnings	0.0096***	0.0034	0.0089***	0.0086***	0.0033
	(2.83)	(0.89)	(2.80)	(3.16)	(1.10)
ES2	-0.0019***	-0.0034***	-0.0004**	-0.0010**	-0.0021***
	(-3.97)	(-6.61)	(-2.09)	(-2.41)	(-4.61)
Intercept	0.0204***	0.0354***	0.0310***	0.0293***	0.0312***
	(10.01)	(3.97)	(13.44)	(15.81)	(14.50)
N	1446	1420	1463	1446	1420
Ajusted R^2	0.1304	0.1375	0.2041	0.1271	0.1119
Industry Effects	Yes	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes

Table 13: Regression Analysis on the Comparison in Earnings Informativeness between Family and Non-family Firms—Robustness Checks with Alternative Corporate Risk-taking Measures as Control Variables

This table reports the estimates of equation (13) in which the annual returns are regressed on the annual changes in net income (In column (1) (3) (5) (7) (9), we first estimate equation (13) without including those interaction terms except for $NI \times FamFirm$.). Equation (13) potentially suffers from an endogeneity issue. Specifically, a firm's stock return (RET) and the degree of risk-taking in its operation (*RISK1*) could be jointly impacted by its firm-level investor protection (GOV). Therefore, we use two-stage least-squares regressions to estimate equation (13), in which the estimation of equation (11) to get the fitted value of *RISK1* is the first stage. As presented in Table 12, based on different methods of construction, 5 alternative *RISK1* measures are created. We then examine whether using the 5 alternative *RISK1* measures would affect our results. *RISK1_A1* is the industry-adjusted volatility of corporate earnings, constructed based on the one-digit SIC industry category and by using the most recent 12 quarters of data ($T = 12$) under the condition that firms have earnings and total assets available for at least 12 quarters; *RISK1_A2* is the industry-adjusted volatility of corporate earnings, constructed based on the one-digit SIC industry category and by using the most recent 20 quarters of data ($T = 20$) under the condition that firms have earnings and total assets available for at least 20 quarters; *RISK1_A3* is the industry-adjusted volatility of corporate earnings, constructed based on the two-digit SIC industry category and by using the most recent 12 quarters of data ($T = 12$) under the condition that firms have earnings and total assets available for at least 12 quarters; *RISK1_A4* is the industry-adjusted volatility of corporate earnings, constructed based on the three-digit SIC industry category and by using the most recent 12 quarters of data ($T = 12$) under the condition that firms have earnings and total assets available for at least 12 quarters; *RISK1_A5* is the industry-adjusted volatility of corporate earnings, constructed based on the three-digit SIC industry category and by using the most recent 20 quarters of data ($T = 20$) under the condition that firms have earnings and total assets available for at least 20 quarters; RET is 12-month cumulative raw return ending three months after the fiscal year-end at t; NI is the scaled change in net income; $FamFirm$ is a binary variable that is equal to one when the firm is a family firm as identified by Business Week (2003), and zero otherwise; other independent variables include firm size ($SIZE$), firm leverage (LEV), firm age (AGE), market-to-book ratio (MB), return on assets (ROA), loss dummy ($LOSS$), and the interaction terms between NI and all of these separate variables including $FamFirm$. Please refer to Appendix C for variable definitions. Regressions include two-digit SIC industry fixed effects. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

Table 13: Regression Analysis on the Comparison in Earnings Informativeness between Family and Non-family Firms—Robustness Checks with Alternative Corporate Risk-taking Measures as Control Variables

	RET (1)	RET (2)		RET (3)	RET (4)		RET (5)	RET (6)		RET (7)	RET (8)		RET (9)	RET (10)
NI	0.7015***	-0.9276	NI	0.7298***	-0.2356	NI	0.6924***	-0.8815	NI	0.7013***	-1.0328	NI	0.7326***	-0.1827
	(6.48)	(-1.01)		(6.62)	(-0.24)		(6.11)	(-0.93)		(6.46)	(-1.12)		(6.67)	(-0.19)
NI×FamFirm	0.7857***	0.8359***	NI×FamFirm	0.5720***	0.6411***	NI×FamFirm	0.7605***	0.8411***	NI×FamFirm	0.7777***	0.8227***	NI×FamFirm	0.5702***	0.5904***
	(4.06)	(4.25)		(2.70)	(2.92)		(3.75)	(4.11)		(4.01)	(4.19)		(2.70)	(2.75)
NI×RISK1_A1		26.7688***	NI×RISK1_A2		17.7566**	NI×RISK1_A3		31.8777***	NI×RISK1_A4		35.8938***	NI×RISK1_A5		23.6684**
		(2.84)			(2.01)			(2.93)			(3.22)			(2.28)
NI×SIZE		0.0157	NI×SIZE		-0.0428	NI×SIZE		0.0068	NI×SIZE		0.0205	NI×SIZE		-0.0519
		(0.18)			(-0.49)			(0.08)			(0.24)			(-0.59)
NI×LEV		-2.0990***	NI×LEV		-2.0512***	NI×LEV		-2.0681***	NI×LEV		-2.0686***	NI×LEV		-2.1195***
		(-3.14)			(-2.86)			(-2.99)			(-3.09)			(-3.01)
NI×MB		-0.2598*	NI×MB		-0.3277**	NI×MB		-0.2801**	NI×MB		-0.2552*	NI×MB		-0.3151**
		(-1.93)			(-2.38)			(-2.00)			(-1.90)			(-2.30)
NI×AGE		0.5730***	NI×AGE		0.5593***	NI×AGE		0.5671***	NI×AGE		0.5745***	NI×AGE		0.5575***
		(4.97)			(4.69)			(4.75)			(4.98)			(4.71)
NI×LOSS		0.0660	NI×LOSS		-0.0266	NI×LOSS		0.0812	NI×LOSS		0.0380	NI×LOSS		-0.0370
		(0.24)			(-0.09)			(0.28)			(0.14)			(-0.13)
NI×ROA		-0.7316	NI×ROA		-0.6506	NI×ROA		-0.5786	NI×ROA		-0.6082	NI×ROA		-0.7510
		(-0.56)			(-0.45)			(-0.42)			(-0.46)			(-0.53)
FamFirm	0.0106	0.0077	FamFirm	0.0197	0.0176	FamFirm	0.0167	0.0124	FamFirm	0.0152	0.0107	FamFirm	0.0207	0.0181
	(0.52)	(0.38)		(0.96)	(0.87)		(0.79)	(0.60)		(0.73)	(0.52)		(1.00)	(0.88)
RISK1_A1Fit	0.6849	0.1051	RISK1_A2Fit	2.8823	1.7083	RISK1_A3Fit	-16.4090**	-14.9350**	RISK1_A4Fit	-5.0207	-4.3036	RISK1_A5Fit	-0.2396	-0.0707
	(0.11)	(0.02)		(0.71)	(0.43)		(-2.21)	(-2.05)		(-0.84)	(-0.73)		(-0.05)	(-0.01)
SIZE	-0.0008	-0.0032	SIZE	0.0031	0.0011	SIZE	-0.0179	-0.0180	SIZE	-0.0068	-0.0077	SIZE	0.0001	-0.0006
	(-0.07)	(-0.27)		(0.29)	(0.10)		(-1.41)	(-1.44)		(-0.58)	(-0.66)		(0.01)	(-0.06)
LEV	-0.0972	-0.0825	LEV	-0.0441	-0.0381	LEV	-0.1847*	-0.1591*	LEV	-0.1222	-0.1031	LEV	-0.0686	-0.0518
	(-1.07)	(-0.91)		(-0.47)	(-0.41)		(-1.90)	(-1.66)		(-1.37)	(-1.16)		(-0.75)	(-0.57)
MB	0.0999***	0.1119***	MB	0.0924***	0.1047***	MB	0.1061***	0.1171***	MB	0.1026***	0.1134***	MB	0.0936***	0.1050***
	(5.39)	(5.98)		(4.93)	(5.56)		(5.52)	(6.12)		(5.57)	(6.12)		(5.03)	(5.61)
AGE	-0.0006	-0.0053	AGE	0.0035	-0.0022	AGE	-0.0060	-0.0099	AGE	-0.0034	-0.0075	AGE	0.0015	-0.0032
	(-0.04)	(-0.40)		(0.26)	(-0.16)		(-0.43)	(-0.72)		(-0.25)	(-0.56)		(0.11)	(-0.23)
LOSS	-0.0675*	-0.0619	LOSS	-0.0688*	-0.0663	LOSS	-0.0530	-0.0497	LOSS	-0.0632	-0.0606	LOSS	-0.0667	-0.0672
	(-1.66)	(-1.52)		(-1.65)	(-1.60)		(-1.23)	(-1.18)		(-1.54)	(-1.49)		(-1.61)	(-1.62)
ROA	-0.8255***	-0.9725***	ROA	-0.7193***	-0.8543***	ROA	-0.6265**	-0.7924***	ROA	-0.7581***	-0.9085***	ROA	-0.6989***	-0.8371***
	(-3.57)	(-4.21)		(-3.10)	(-3.69)		(-2.51)	(-3.22)		(-3.22)	(-3.87)		(-2.98)	(-3.56)
Intercept	0.0810	0.1227	Intercept	-0.0097	0.0414	Intercept	0.4587**	0.4524**	Intercept	0.1966	0.2106	Intercept	0.0700	0.0867
	(0.50)	(0.76)		(-0.07)	(0.29)		(2.38)	(2.40)		(1.29)	(1.39)		(0.48)	(0.60)
N	1381	1381	N	1358	1358	N	1381	1381	N	1381	1381	N	1358	1358
Ajusted R^2	0.1309	0.1510	Ajusted R^2	0.1151	0.1342	Ajusted R^2	0.1215	0.1436	Ajusted R^2	0.1304	0.1523	Ajusted R^2	0.1158	0.1354
Industry Effects	Yes	Yes	Industry Effects	Yes	Yes	Industry Effects	Yes	Yes	Industry Effects	Yes	Yes	Industry Effects	Yes	Yes
Year Effects	No	No	Year Effects	No	No	Year Effects	No	No	Year Effects	No	No	Year Effects	No	No

Table 14-1: Regression Analysis on the Comparison in Earnings Informativeness between Family and Non-family Firms—Robustness Checks with Alternative Measures of *Relative* Idiosyncratic Volatility as Control Variables

This table reports the estimates of equation (13) in which the annual returns are regressed on the annual changes in net income (In column (1) (3) (5), we first estimate equation (13) without including those interaction terms except for $NI \times FamFirm$.). Instead of controlling for firm operating risk in equation (13) as presented in Table 9 and Table 13, we alternatively control for firm idiosyncratic risk (or stock price informativeness). However, a firm's stock return (RET) and idiosyncratic volatility could be jointly impacted by its firm-level investor protection (GOV). Therefore, we use two-stage least-squares regressions to estimate equation (13), in which the estimation of equation (10) to get the fitted value of $IdioVol$ is the first stage. In our main test (see Table 10) and analysis, when we control for firm idiosyncratic risk in equation (13), it is constructed based on using weekly stock returns and the market model, which is a regular practice in the literature. For the purpose of robustness check, we alternatively use other stock price informativeness proxies constructed by using daily returns or the industry index model, by which 3 alternative measures are created: $IdioVol\_A1$ is the logistic transformed relative idiosyncratic volatility constructed by using daily stock returns and the market model; $IdioVol\_A2$ is the logistic transformed relative idiosyncratic volatility constructed by using daily stock returns and the industry index model; $IdioVol\_A3$ is the logistic transformed relative idiosyncratic volatility constructed by using weekly stock returns and the industry index model. RET is 12-month cumulative raw return ending three months after the fiscal year-end at t; NI is the scaled change in net income; $FamFirm$ is a binary variable that is equal to one when the firm is a family firm as identified by Business Week (2003), and zero otherwise; other independent variables include firm size $(SIZE)$, firm leverage (LEV), firm age (AGE), market-to-book ratio (MB), return on assets (ROA), loss dummy $(LOSS)$, and the interaction terms between NI and all of these separate variables including $FamFirm$. Please refer to Appendix C for variable definitions. Regressions include two-digit SIC industry fixed effects. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

Table14-1: Regression Analysis on the Comparison in Earnings Informativeness between Family and Non-family Firms—Robustness Checks with Alternative Measures of *Relative* Idiosyncratic Volatility as Control Variables

	RET (1)	RET (2)		RET (3)	RET (4)		RET (5)	RET (6)
NI	0.5272***	-1.3656	NI	0.4641***	-0.6905	NI	0.4755***	-0.5974
	(3.23)	(-0.98)		(2.64)	(-0.39)		(2.71)	(-0.34)
NI×FamFirm	0.9239***	1.1555***	NI×FamFirm	0.9346***	1.2691***	NI×FamFirm	0.9649***	1.3161***
	(3.62)	(4.09)		(3.30)	(3.86)		(3.43)	(3.95)
NI×IdioVol_A1		0.1553	NI×IdioVol_A2		-0.2097	NI×IdioVol_A3		-0.1831
		(0.83)			(-1.49)			(-1.58)
NI×SIZE		0.0906	NI×SIZE		0.2123	NI×SIZE		0.2080
		(0.64)			(1.10)			(1.09)
NI×LEV		-1.3748	NI×LEV		-0.5264	NI×LEV		-0.9644
		(-1.44)			(-0.49)			(-0.95)
NI×MB		0.3768	NI×MB		0.0478	NI×MB		0.0726
		(1.63)			(0.18)			(0.27)
NI×AGE		0.3349*	NI×AGE		-0.1271	NI×AGE		-0.1098
		(1.89)			(-0.52)			(-0.46)
NI×LOSS		-0.4968	NI×LOSS		-0.4621	NI×LOSS		-0.5559
		(-1.27)			(-1.09)			(-1.34)
NI×ROA		-1.1223	NI×ROA		-1.3198	NI×ROA		-2.2227
		(-0.72)			(-0.72)			(-1.19)
FamFirm	0.0119	0.0058	FamFirm	0.0191	0.0137	FamFirm	0.0195	0.0136
	(0.64)	(0.31)		(0.90)	(0.64)		(0.92)	(0.64)
IdioVol_A1Fit	0.0976***	0.0982***	IdioVol_A2Fit	0.0498***	0.0520***	IdioVol_A3Fit	0.0399***	0.0404***
	(5.49)	(5.51)		(3.92)	(4.07)		(3.54)	(3.59)
SIZE	0.0097	0.0093	SIZE	0.0255**	0.0245**	SIZE	0.0197*	0.0180
	(1.04)	(1.00)		(2.15)	(2.05)		(1.74)	(1.58)
LEV	-0.1411*	-0.1535*	LEV	-0.0587	-0.0512	LEV	-0.0550	-0.0468
	(-1.69)	(-1.84)		(-0.62)	(-0.53)		(-0.58)	(-0.49)
MB	0.0708***	0.0730***	MB	0.0885***	0.0913***	MB	0.0889***	0.0914***
	(3.80)	(3.87)		(4.37)	(4.47)		(4.41)	(4.50)
AGE	0.0233*	0.0218*	AGE	0.0329**	0.0324**	AGE	0.0328**	0.0326**
	(1.87)	(1.74)		(2.10)	(2.04)		(2.11)	(2.06)
LOSS	-0.1527***	-0.1554***	LOSS	-0.1232***	-0.1203***	LOSS	-0.1219***	-0.1173**
	(-3.76)	(-3.82)		(-2.72)	(-2.63)		(-2.70)	(-2.58)
ROA	-0.2172	-0.2723	ROA	-0.3869	-0.4194	ROA	-0.4167*	-0.4396*
	(-0.99)	(-1.22)		(-1.55)	(-1.63)		(-1.68)	(-1.73)
Intercept	-0.2430**	-0.2299**	Intercept	-0.2789**	-0.2717**	Intercept	-0.2240*	-0.2111*
	(-2.41)	(-2.28)		(-2.34)	(-2.26)		(-1.96)	(-1.84)
N	1087	1087	N	898	898	N	898	898
Ajusted R^2	0.1945	0.2006	Ajusted R^2	0.1856	0.1872	Ajusted R^2	0.1851	0.1873
Industry Effects	Yes	Yes	Industry Effects	Yes	Yes	Industry Effects	Yes	Yes
Year Effects	No	No	Year Effects	No	No	Year Effects	No	No

Table 14-2: Regression Analysis on the Comparison in Earnings Informativeness between Family and Non-family Firms—Robustness Checks with Alternative Measures of *Absolute* Idiosyncratic Volatility as Control Variables

This table reports the estimates of equation (13) in which the annual returns are regressed on the annual changes in net income (In column (1) (3) (5) (7), we first estimate equation (13) without including those interaction terms except for $NI \times FamFirm$.). Instead of controlling for firm operating risk in equation (13) as presented in Table 9 and Table 13, we alternatively control for firm idiosyncratic risk (or stock price informativeness). However, a firm's stock return (RET) and idiosyncratic volatility could be jointly impacted by its firm-level investor protection (GOV). Therefore, we use two-stage least-squares regressions to estimate equation (13), in which the estimation of equation (10) to get the fitted value of $IdioVol$ is the first stage. In Table 10 and Table 14-1, when we control for firm idiosyncratic risk in equation (13), it is constructed as the logistic transformed *relative* idiosyncratic volatility. For the purpose of robustness check, we alternatively use the natural logarithm of *absolute* idiosyncratic volatility constructed by using either daily returns or weekly returns and either the market model or the industry index model, by which 4 alternative measures are created: $IdioVol\_A4$ is the natural logarithm of absolute idiosyncratic volatility constructed by using daily stock returns and the market model; $IdioVol\_A5$ is the natural logarithm of absolute idiosyncratic volatility constructed by using weekly stock returns and the market model; $IdioVol\_A6$ is the natural logarithm of absolute idiosyncratic volatility constructed by using daily stock returns and the industry index model; $IdioVol\_A7$ is the natural logarithm of absolute idiosyncratic volatility constructed by using weekly stock returns and the industry index model. RET is 12-month cumulative raw return ending three months after the fiscal year-end at t; NI is the scaled change in net income; $FamFirm$ is a binary variable that is equal to one when the firm is a family firm as identified by Business Week (2003), and zero otherwise; other independent variables include firm size ($SIZE$), firm leverage (LEV), firm age (AGE), market-to-book ratio (MB), return on assets (ROA), loss dummy ($LOSS$), and the interaction terms between NI and all of these separate variables including $FamFirm$. Please refer to Appendix C for variable definitions. Regressions include two-digit SIC industry fixed effects. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

Table 14-2: Regression Analysis on the Comparison in Earnings Informativeness between Family and Non-family Firms—Robustness Checks with Alternative Measures of *Absolute* Idiosyncratic Volatility as Control Variables

	RET (1)	RET (2)		RET (3)	RET (4)		RET (5)	RET (6)		RET (7)	RET (8)
NI	0.6616***	3.1600	NI	0.6227***	1.7357	NI	0.3717*	-0.3770	NI	0.3735**	-0.7858
	(3.64)	(1.45)		(3.44)	(0.90)		(1.95)	(-0.18)		(1.97)	(-0.40)
NI×FamFirm	0.9497***	1.0546***	NI×FamFirm	0.9732***	1.0701***	NI×FamFirm	0.9358***	0.9819***	NI×FamFirm	0.9375***	1.0010***
	(3.34)	(3.44)		(3.46)	(3.53)		(3.15)	(2.96)		(3.17)	(3.03)
NI×IdioVol_A4		0.6936***	NI×IdioVol_A5		0.5848**	NI×IdioVol_A6		0.1609	NI×IdioVol_A7		0.1094
		(2.58)			(2.33)			(0.83)			(0.62)
NI×SIZE		0.3331	NI×SIZE		0.3136	NI×SIZE		0.2945	NI×SIZE		0.2773
		(1.64)			(1.57)			(1.41)			(0.35)
NI×LEV		-1.3625	NI×LEV		-1.3688	NI×LEV		-1.0852	NI×LEV		-1.0431
		(-1.32)			(-1.34)			(-0.98)			(-0.95)
NI×MB		0.0888	NI×MB		0.1049	NI×MB		-0.1774	NI×MB		-0.1558
		(0.32)			(0.39)			(-0.61)			(-0.54)
NI×AGE		0.2870	NI×AGE		0.2120	NI×AGE		0.0956	NI×AGE		0.0663
		(1.07)			(0.83)			(0.34)			(0.24)
NI×LOSS		-0.9367**	NI×LOSS		-0.8844**	NI×LOSS		-0.6457	NI×LOSS		-0.6131
		(-2.13)			(-2.040			(-1.41)			(-1.34)
NI×ROA		-1.6924	NI×ROA		-1.5440	NI×ROA		-1.4842	NI×ROA		-1.4376
		(-0.91)			(-0.84)			(-0.77)			(-0.75)
FamFirm	0.0355	0.0329	FamFirm	0.0332	0.0312	FamFirm	0.0032	0.0016	FamFirm	0.0022	0.0006
	(1.64)	(1.51)		(1.54)	(1.44)		(0.14)	(0.07)		(0.09)	(0.02)
IdioVol_A4Fit	-0.1457***	-0.1618***	IdioVol_A5Fit	-0.1133***	-0.1269***	IdioVol_A6Fit	0.0795**	0.0791**	IdioVol_A7Fit	0.0732**	0.0728**
	(-4.12)	(-4.47)		(-2.83)	(-3.10)		(2.53)	(2.48)		(2.37)	(2.31)
SIZE	-0.0229*	-0.0265**	SIZE	-0.0166	-0.0199	SIZE	0.0378**	0.0360**	SIZE	0.0337**	0.0319*
	(-1.92)	(-2.20)		(-1.37)	(-1.63)		(2.13)	(2.01)		(1.97)	(1.84)
LEV	-0.1521	-0.1440	LEV	-0.1477	-0.1368	LEV	-0.0321	-0.0164	LEV	-0.0318	-0.0162
	(-1.59)	(-1.50)		(-1.55)	(-1.43)		(-0.31)	(-0.16)		(-0.31)	(-0.15)
MB	0.1105***	0.1115***	MB	0.1074***	0.1088***	MB	0.0824***	0.0847***	MB	0.0833***	0.0859***
	(5.32)	(5.33)		(5.17)	(5.22)		(3.81)	(3.88)		(3.88)	(3.96)
AGE	-0.0001	-0.0044	AGE	0.0054	0.0016	AGE	0.0457**	0.0450**	AGE	0.0456**	0.0449**
	(-0.00)	(-0.26)		(0.32)	(0.09)		(2.52)	(2.44)		(2.49)	(2.42)
LOSS	-0.1104**	-0.1198**	LOSS	-0.1168**	-0.1230***	LOSS	-0.1454***	-0.1456***	LOSS	-0.1447***	-0.1441***
	(-2.41)	(-2.56)		(-2.58)	(-2.67)		(-3.04)	(-3.00)		(-3.04)	(-2.99)
ROA	-0.6566***	-0.6493**	ROA	-0.6261**	-0.6263**	ROA	-0.3377	-0.3130	ROA	-0.3419	-0.3226
	(-2.60)	(-2.52)		(-2.49)	(-2.45)		(-1.26)	(-1.14)		(-1.28)	(-1.18)
Intercept	-0.9981***	-1.0931***	Intercept	-0.6220***	-0.6810***	Intercept	0.2946*	0.3006*	Intercept	0.1669	0.1739
	(-3.93)	(-4.21)		(-2.72)	(-2.91)		(1.72)	(1.72)		(1.20)	(1.23)
N	898	898	N	898	898	N	898	898	N	898	898
Ajusted R^2	0.1853	0.1907	Ajusted R^2	0.1824	0.1867	Ajusted R^2	0.1628	0.1613	Ajusted R^2	0.1641	0.1626
Industry Effects	Yes	Yes	Industry Effects	Yes	Yes	Industry Effects	Yes	Yes	Industry Effects	Yes	Yes
Year Effects	No	No	Year Effects	No	No	Year Effects	No	No	Year Effects	No	No

Appendix A: Definition of Control Variables for Regression Analysis on the Comparison in Idiosyncratic Volatility between Family and Non-family Firms

Variable		Definition	Source
		(Note: the combination of capital letters in each pair of parentheses represents Compustat code for its corresponding variable)	
Return-on-equity	*ROE*	Return-on-equity is defined as the ratio of income before extraordinary items (IB) to total common/ordinary equity (CEQ).	Compustat & Author's computation
Volatility of return-on-equity	*VROE*	Defined as sample variance of quarterly ROEs over the last 12 quarters (i.e. over the last 3 years).	Compustat & Author's computation
Leverage	*LEV*	Leverage is defined as the ratio of long-term debt (DLTT) to total assets (AT).	Compustat & Author's computation
Market-to-book	*M/B*	Market-to-book is defined as the natural logarithm of the ratio of total market value of equity (MKVALT) to total common/ordinary equity (CEQ).	Compustat & Author's computation
Market capitalization	*SIZE*	Market capitalization is defined as the natural logarithm of total market value of equity (MKVALT).	Compustat & Author's computation
Dividend dummy	*DD*	Dividend dummy is defined as being equal to one if a firm pays dividends (such firms with distribution code "1232" are identified through CRSP, where "1232" represents "US cash dividend, quarterly, taxable same rate as dividends".), and zero otherwise.	CRSP
Firm age	*AGE*	Firm age is measured as the natural logarithm of years, where years are computed by dividing the number of months, since a stock was incorporated into CRSP, by 12. The begin of stock data are obtained from CRSP Stock Header Information.	CRSP & Author's computation
Diversification dummy	*DIVER*	Diversification dummy is defined as being equal to one if a firm has more than one two-digit SIC code, and zero otherwise.	Compustat
Earnings smoothing (*ES1* and *ES2*)	*ES1 and ES2*	(1) Earnings smoothing (*ES1*) is defined as the ratio of the standard deviation of operating income (OIADP) to the standard deviation of operating cash flow, in which both the numerator and the denominator are scaled by lagged total assets (AT). Operating cash flow is defined as operating income (OIADP) minus accruals, where accruals are defined as: $ACCRUALS_{i,t} = (\Delta CA_{i,t} - \Delta CASH_{i,t}) - (\Delta CL_{i,t} - \Delta STD_{i,t} - \Delta TP_{i,t}) - DEP_{i,t}$, in which $CA_{i,t}$ is total current assets (ACT), $CASH_{i,t}$ is cash or cash equivalents (CHE), $CL_{i,t}$ is total current liabilities (LCT), $STD_{i,t}$ is short-term debt (DLC), $TP_{i,t}$ is income tax payable (TXP), and $DEP_{i,t}$ is depreciation expense (DP); "*i* " denotes companies and "*t* " indexes years. A *lower* value of *ES1* would indicate a *higher* level of earnings smoothing. (2) For convenience of expression, we construct an alternative measure (*ES2*) of earnings smoothing, where *ES2* = 1 - *ES1*. A *higher* value of *ES2* would indicate a *higher* level of earnings smoothing.	Compustat & Author's computation

Appendix B: Definition of Control Variables for Regression Analysis on the Comparison in Corporate Risk-taking between Family and Non-family Firms

Variable		Definition	Source
		(Note: the combination of capital letters in each pair of parentheses represents Compustat code for its corresponding variable)	
Initial firm size	*LogInitialFirmSize*	Initial firm size is defined as the natural logarithm of total assets (AT), where total assets (AT) are retrieved as of 2003 which is the beginning year of our sample period (2003—2007).	Compustat & Author's computation
Initial book leverage	*InitialBookLeverage*	Initial book leverage is defined as the ratio of book debt to total assets (AT), where book debt is defined as total liabilities (LT) plus preferred stock (PSTK) minus deferred taxes (TXDB). All the variables are retrieved as of 2003 which is the beginning year of our sample period (2003—2007).	Compustat & Author's computation
Initial corporate earnings	*InitialCorporateEarnings*	Initial corporate earnings are defined as the ratio of EBITDA (OIBDP) to total assets (AT). Both of the two variables are retrieved as of 2003 which is the beginning year of our sample period (2003—2007).	Compustat & Author's computation
Initial sales growth	*InitialSalesGrowth*	Initial sales growth is defined as the average annual sales growth over our sample period (2003—2007), where annual sales growth at t is defined as $(S_t / S_{t-1}) - 1$, in which "S" represents sales and "t" indexes years.	Compustat & Author's computation
Earnings smoothing (*ES1* and *ES2*)	*ES1* and *ES2*	(1) Earnings smoothing (*ES1*) is defined as the ratio of the standard deviation of operating income (OIADP) to the standard deviation of operating cash flow, in which both the numerator and the denominator are scaled by lagged total assets (AT). Operating cash flow is defined as operating income (OIADP) minus accruals, where accruals are defined as: $ACCRUALS_{i,t} = (\Delta CA_{i,t} - \Delta CASH_{i,t}) - (\Delta CL_{i,t} - \Delta STD_{i,t} - \Delta TP_{i,t}) - DEP_{i,t}$, in which $CA_{i,t}$ is total current assets (ACT), $CASH_{i,t}$ is cash or cash equivalents (CHE), $CL_{i,t}$ is total current liabilities (LCT), $STD_{i,t}$ is short-term debt (DLC), $TP_{i,t}$ is income tax payable (TXP), and $DEP_{i,t}$ is depreciation expense (DP); "i" denotes companies and "t" indexes years. A *lower* value of *ES1* would indicate a *higher* level of earnings smoothing. (2) For convenience of expression, we construct an alternative measure (*ES2*) of earnings smoothing, where *ES2 = 1 - ES1*. A *higher* value of *ES2* would indicate a *higher* level of earnings smoothing.	Compustat & Author's computation

Appendix C: Definition of Control Variables for Regression Analysis on the Comparison in Earnings Informativeness between Family and Non-family Firms

Variable		Definition	Source
		(Note: the combination of capital letters in each pair of parentheses represents Compustat code for its corresponding variable)	
Scaled change-in-net-income	*NI*	Scaled change-in-net-income is defined as the difference between net income (NI) for year t and net income for year t-1, divided by the total market value of equity (MKVALT) at the end of year t-1.	Compustat & Author's computation
Firm size	*SIZE*	Firm size is defined as the natural logarithm of total market value of equity (MKVALT).	Compustat & Author's computation
Firm leverage	*LEV*	Firm leverage is defined as the ratio of long-term debt (DLTT) to total assets (AT).	Compustat & Author's computation
Market-to-book	*MB*	Market-to-book is defined as the natural logarithm of the ratio of total market value of equity (MKVALT) to total common/ordinary equity	Compustat & Author's computation
Firm age	*AGE*	Firm age is measured as the natural logarithm of years, where years are computed by dividing the number of months, since a stock was incorporated into CRSP, by 12. The begin of stock data are obtained from CRSP Stock Header Information.	CRSP & Author's computation
Loss dummy	*LOSS*	Loss dummy is defined as being equal to one if a firm's net income (NI) is less than zero, and zero otherwise.	Compustat
Return-on-assets	*ROA*	Return-on-assets is defined as income before extraordinary items (IB) divided by total assets (AT).	Compustat & Author's computation