Three Essays on Ownership Issues in Corporate Finance

Dissertation

by

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ABSTRACT

The study consists of three research topics about corporate ownership and financial issues. Existing literature focuses on overall corporate ownership structure. This study extends the existing literature by studying the impacts of different ownership types. Different types of shareholders are different in several key aspects such as investment policies, targets, and risk preference, all of which influence how they execute their screening role over the companies, and are important determinants of firms' decisions. To the extant literature, scholars have employed various perspectives to examine corporate ownership. In this study, I will be focusing on the behavior agency theory, agency theory, and socioemotional wealth theory, in the hope of bringing a more nuanced insight of the impacts of different corporate ownership on financial issues, such as, cost of bank loan, the formation of international joint venture, and CEO turnover.

In the first essay, I employ a sample of U.S. public companies between 2007 and 2016 to explore the joint effects of executive inside debt (EID) and family involvement on the cost of bank loans. The empirical results indicate that the mitigating effect of EID on the cost of bank loans is attenuated for family firms. In addition, I provide evidence for the following: 1) the mitigating effect of EID on cost of debt is strengthened when a firm's performance is lower than its aspiration level and 2) the moderating effect of family involvement is significant when firm performance is above its aspiration level. Collectively, our findings support the behavioral agency prediction that family involvement shapes firms' risk-taking preference, which acts as a substitute for EID in decreasing the cost of debt.

In the second essay, I examine whether family involvement in business affects firms' engagement in international joint ventures (IJVs). Building on the narrow framing perspective, I

argue that family businesses are more prone to utilize risk diversifying strategies over multiple IJV choices than non-family firms, because the family firms' decisions tend to be broadly-framed. Examining the interaction between three IJV decisions (type of IJV, choice of host country, and number of partners) in a sample of 1,439 IJVs formed by publicly traded companies in the US, we found support for our predictions.

In the third essay, I explore how institutional holding together with other finance factors affect the likelihood of CEO turnover and whether analyst forecast accuracy serves as a mechanism through which institutional holding influences the likelihood of CEO turnover. I find that increased institutional shareholding results in a lower likelihood of CEO turnover directly as well as indirectly (through the mechanism of analyst forecast accuracy). We also investigate the impact of CEO turnover on subsequent firm performance using market-based measures, including firm value and the cost of equity. Moreover, we examine whether different types of CEO turnover would make a difference on firm value and cost of equity. Our results reveal that after CEO turnover—especially when the previous CEO is forced to leave, and the successor is from outside the company—the firm value is higher, and the cost of equity is lower.

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Dedication

To my family.

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CHAPTER 1: GENERAL INTRODUCTION

1.1 General Background

Existing literature has studied various types of corporate ownership: government ownership, financial institutions ownership, family ownership, foreign ownership, and managerial ownership (Borisova et al. 2012; Hadani, Goranova, and Khan 2011; Villalonga and Amit 2006; Dahlquist and Robertsson 2001; Kronborg and Thomsen 2009; Warfield, Wild, and Wild 1995; Zhou 2001). Family ownership and institutional ownership play a crucial role in stock markets. According to a family business report by Pieper and Kellermanns (2021), in 2019, family-owned businesses generated 54% of private sector GDP in the U.S. and employed 59% of the private sector workforce. On the other hand, more than 80% of the U.S. common shares are owned by institutional investors such as hedge funds, bank trust departments, pension funds, mutual funds, and other institutions.

Family firms pursue not only economic goals, but also non-economic goals, owing to families' strong emotional attachment, commitment to, and identification with the firm (Gómez-Mejía et al. 2007; Le Breton-Miller and Miller 2009; Habbershon and Williams 1999). Because of this, family firms are considered as more risk-averse than non-family firms (Gomez-Mejia, Makri, & Kintana, 2010; Zahra, 2005). In addition, the risk-preferences of family firms are diverse, and are conditional on their relative performance and their investment horizon (Chrisman & Patel, 2012).

In the first two essays of this dissertation, I examine the influence of family ownership on the cost of debt and on the formation of international joint ventures. Scholars have used a wide

range of perspectives to examine family business. To provide a more nuanced understanding of finance in family business, I focus on the three most influential theories and perspectives in the literature: behavior agency theory, socioemotional wealth (SEW) theory, and the narrow framing perspective.

Existing research concludes that family involvement reduces the agency costs associate with debt financing because family firms are more risk-averse and can effectively monitor executives to prevent them taking excessive risks (Anderson et al., 2003). Another body of research reveals that executive inside debt, which exposes executives to the same risks like external creditors, can also reduce borrowing costs. We are interested in study the moderating effect of family involvement on the association between executive inside debt and cost of debt. In the first essay, I employ a sample of U.S. public companies between 2007 and 2016, and explore the joint effects of executive inside debt (EID) and family involvement on the cost of bank loans. The empirical results indicate the mitigating impact of EID on the cost of debt is attenuated in family businesses than in their non-family counterparts. I also provide evidence that the mitigating effect of EID on cost of debt is strengthened when a firm's financial performance is lower than the aspiration level, and the moderating effect of family involvement is significant when firm performance is above its aspiration level. Collectively, the findings support the behavioral agency prediction that family involvement shapes firms' risk-taking preferences, which act as a substitute for EID in decreasing the cost of debt.

Prior research on the importance of family ownership in IJVs has mostly focused on how much more likely family businesses are than non-family businesses to form IJVs a (e.g., Swinth & Winton, 1993; Abdellatif et al., 2010; Sestu & Majocchi, 2020; Xu et al., 2020; Debellis et al.,

2021). As a result, little is known about how family involvement affects firms engage in IJVs. In the second essay, I examine whether family involvement affects firms' engagements in international joint ventures (IJVs). I employ a sample of 1,439 IJVs formed by U.S. firms on the Standard & Poor 1500 list between 1997 and 2014. The study provides evidence that family firms are more likely to 1) pursue related rather than unrelated IJVs; 2) form IJVs in countries with high institutional protections; and 3) prefer multi-party IJVs to dyadic ones (because doing so allows family firms to preserve the owning family's SEW endowments). Building on the narrow framing perspective, I argue that family firms utilize risk diversifying strategies over multiple IJV choices more than non-family firms do; this occurs because family firms' decisions tend to be broadly-framed.

Until recent years, institutional investors have received increasing attention from both practitioners and academics. They are widely considered to have more expertise in managing and monitoring companies (Boehmer and Kelly, 2009). Their presence helps to stabilize markets and corporate value creation (Shleifer and Vishny, 1986; Dasgupta and Piacentino, 2015; Barclay and Holderness, 1990). Researchers find that institutional shareholders can effectively influence corporate governance through voice or exit approaches (Admati and Pfleiderer, 2009; Edmans and Manso, 2011; Kahn and Winton, 1998). Higher institutional ownership is associated with better corporate governance, higher information transparency and better management disclosure (Nesbitt, 1994; Boone and White, 2015). Parrino, Sias, and Starks (2003) found that institutional shareholders usually reduce their holdings before a forced CEO turnover. In the third essay, I explore how institutional holdings, together with analyst forecast accuracy affect the likelihood of CEO turnover, and whether the forecast accuracy of financial analysts acts as a mechanism through

which institutional holdings influence the likelihood of CEO turnover. I find that institutional holding has both a direct effect on CEO turnover and an indirect effect (via analyst forecast accuracy). In addition, the results reveal that following CEO turnover, the firm's market value increases, and the cost of equity decreases.

1.2 Summary of Thesis Achievements

The first essay extends the literature in the following ways. First, it is among the first to investigate the conditions in which the executive inside debt might have a different influence on the cost of debt, even though there is an expanding amount of research exploring the economic effects of executive inside debt (Carroll and Niehaus, 1998; Anantharaman et al., 2014). I specifically show that family involvement attenuates the association between executive inside debt and cost of debt. Additionally, the research contributes to the body of TMT literature by considering the executive inside debt of the CEO and CFO as well as that of the senior management team. Key financial decisions are typically the responsibility of the CFO, but other TMT members may also have an impact on how their companies make decisions. Second, by examining whether the moderating impact of family involvement differs among heterogeneous groups, such as those below and above ambition level groups, this study also contributes to the body of literature on the heterogeneity of family firms. Third, by comparing the financial crisis and post-crisis period, this paper investigates the heterogeneous effects of family participation, adding to the literature by discussing the effects of a financial crisis.

The second essay significantly advances several areas of the literature. First, the findings show that family firms engage in IJVs less frequently than nonfamily firms (e.g., Abdellatif et al., 2010). By examining three significant post-formation decisions, this study furthers this area of

investigation. This study offers a more nuanced picture of the impact that family ownership plays in choices made regarding international joint ventures by taking a closer look at the firm's selection of IJV type, host country, and partners. The results show that examining IJV decisions separately or in isolation may result in incorrect conclusions about firms' risk-taking behaviors and fail to recognize on unique family firm' risk management strategies to multiple risks associated with IJVs. Second, the research responses to a recent call from international business scholars to explore whether, how, and why family firms are different from nonfamily firms in their approach to IJV decisions (Nippa and Reuer 2019). Additionally, this study expands the utility of the narrow-framing perspective in foretelling the risk-taking tendencies of family firms (Kahneman and Lovallo 1993; Read and Loewenstein 1995). By examining how firms approach an initiative made up of multiple risky decisions that are inescapably interrelated, as is the case with IJVs, I extend the utility of the narrow framing perspective. This study demonstrates that a firm's propensity to frame decisions narrowly or widely need not end with the choice to engage in risky activities; rather, it may continue to impact how these activities are carried out.

The third essay makes several contributions to the body of literature. Since previous research have mostly concentrated on how firm performance influences CEO turnover. The field of study has already reached its saturation point (Brickley 2003). The paper expands the literature on the causes of CEO turnover. I not only find compelling evidence in this analysis that institutional shareholdings can have a direct impact on CEO turnover, but also that analyst forecast accuracy could be a channel through which institutional shareholdings can have an indirect impact. Second, the vast majority of studies are utilizing accounting-based indicators to analyze post-turnover firm performance; there is little study employing market-based measures, which is

unexpected considering the increased frequency of CEO turnover in recent years. By employing market-based metrics like company valuation and the cost of equity, this study contributes to the body of literature by offering empirical evidence on the relationship between CEO turnover and post-turnover firm performance. Thirdly, I intend to reconcile the contradictory results of the various types of CEO turnover on subsequent performance.

CHAPTER 2: ESSAY 1

Can Family Involvement Be a Substitute for Executive Inside Debt in Lowering the Cost of Bank Loans? A Behavioral Agency Perspective

Abstract

Using a sample of listed companies in the U.S. between 2007 and 2016, we explore the joint effects of executive inside debt (EID) and family involvement on the cost of bank loans. The empirical results indicate that the negative relationship between EID and the cost of bank loans is attenuated in family firms than in their non-family counterparts. We also provide evidence that 1) the mitigating effect of EID on cost of debt is strengthened when a firm's performance is lower than its aspiration level and 2) the moderating effect of family involvement is significant when firm performance is above its aspiration level. Collectively, our findings support the behavioral agency prediction that family involvement shapes firms' risk-taking preference, which acts as a substitute for EID in decreasing the cost of debt.

Keyword: Family Involvement; Executive Inside Debt; Cost of Bank Loan; Aspiration Level

2.1 Introduction

Executive debt-like compensation, such as deferred components in managers' compensation packages and defined-benefit pension plans, is also called "executive inside debt" (EID) as they represent required fixed obligations the firm must pay to executives (Wei and Yermack, 2011). The EID is usually unfunded and unsecured, making managers exposed to similar default risk borne by outside creditors. Recently, researchers in accounting and finance have started looking into the capital market consequences of debt-like compensation (Anantharaman et al., 2014). Unlike equity-based compensation, EID can refrain executives from excessive risk taking and motivate them to focus on the long-term goals of their firms. Wei and Yermack (2011) find that firms whose CEOs are granted higher EID have a higher liquidation value and a lower default risk, and Cassell, Huang, Manuel Sanchez and Stuart (2012) show that higher EID leads to a lower firm risk with respect to financial and investment policies. Therefore, inside debt serves as a mechanism that can mitigate shareholders-debtholders conflict (Jensen and Meckling, 1976). Empirical evidence also indicates that EID lowers yield spread and the number of covenants in loan contracts (Anantharaman et al., 2014).

Family-controlled firms are important not only to local markets but also to national economies (Verbeke and Kano, 2012), since family firms continuously contribute to job creation, wealth accumulation, and building competitive advantage at the national level (Westhead and Cowling, 1998). According to a family business report by Pieper and Kellermanns (2021), in 2019, family-owned businesses generated 54% of private sector GDP in the U.S. and employed 59% of the private sector workforce. Research on family business employs the preservation of socioemotional wealth (SEW) as one of the important considerations to analyze family firms'

decision-making process (Gómez-Mejía et al., 2007; Chua et al., 2015). Different from many non-family firms that are primarily driven by achieving financial objectives, family firms attach relatively "higher priority" to preserving SEW (Gómez-Mejía et al., 2007; Chrisman and Patel, 2012). For example, family firms are inclined to provide more detailed and accurate financial information (Wang, 2006), and less inclined than their non-family counterparts to use accruals to inflate net income (Martin et al., 2016). In addition, among Standard & Poor 1500 index firms, family firms are more conservative in reporting for taxation purposes than non-family firms (Chen et al., 2010), because they care more about potential penalty and reputational damage that could result from aggressive tax avoidance. These findings are in accordance with the perspective that family firms tend to be more risk-averse because their owners have a strong incentive to protect their family image or family reputation, which mitigates the agency conflict between shareholders and debtholders.

Considering the prior evidence on the mitigating effect of EID on the cost of debt (Chava et al., 2009; Anantharaman et al., 2014; Dang and Phan 2016), in this study we aim to explore how family involvement moderates the association between EID and the cost of debt. The theoretical framework for this study is that family involvement lowers the agency costs in debt financing since family businesses are relatively risk-averse and can efficiently monitor executives to avoid excessive risk-taking (Anderson et al., 2003). As a result, we expect that family involvement will weaken the effect of EID on reducing the cost of debt.

The heterogeneity of family firms has long been recognized and much attention has been devoted to understanding the heterogeneity (Chrisman et al., 2012). Such heterogeneity can be driven by several factors, including the pursue of both economic and noneconomic objectives

(Westhead and Howorth, 2007; Chrisman and Patel, 2012); governance structure arising from various combinations of family control, management, and ownership (Villalonga and Amit, 2006); resource availability (Habbershon et al., 2003); and the capacity to execute its plans (Chua et al., 2012). Therefore, we explore how heterogeneity among family firms affects the mitigating effect of EID on the cost of debt. In particular, the risk-taking appetite could be different for family firms with divergent performance. When a family firm has achieved performance above its expectation, the family firm has reduced incentive to take risk, which implies that inside debt is less likely to be granted to executives. In contrast, if a family firm has performance below its expectation, the likelihood of bankruptcy is higher. The family firm's economic and noneconomic goals tend to converge because once it goes bankrupt, the family loses its socioemotional wealth (Chrisman and Patel, 2012), which suggests that the constraining effect of preserving socioeconomic wealth on risk-taking becomes weaker. Therefore, when past performance of a family firm is relatively poor, the firm is expected to adopt more aggressive investment strategies and financing policies. Under such circumstances, EID can play a more significant role in reducing the cost of bank loans because debt-like compensation can better align the interests of executives and creditors. At the same time, the moderating effect of family involvement becomes attenuated. To summarize, we attempt to address the research question of whether family involvement moderate the effects of EID on the cost of bank loans, and if yes, how? In addition, we also explore the effects of a firm's relative performance on the above-mentioned moderating role of family involvement.

Analyzing 4,180 bank loans issued by 817 publicly listed U.S. firms between 2007 and 2016, we find that family firms provide their executives with less debt-like compensation than their non-family counterparts and higher EID leads to a lower cost of bank loans. More importantly,

our findings support that the negative association between EID and the cost of bank loans is attenuated in family firms, but is strengthened when firm's financial performance is lower than its aspiration levels measured by industry median and historical performance. We also investigate the potential different association between EID and cost of debt between the global financial crisis period (2007-2010) and post-financial crisis period (2011-2016). The rationale is that banks have an economic incentive to charge higher interest rates on borrowers during crisis periods when banks themselves are financially constrained. EID, which can effectively reduce the risk-taking appetite of firms, is expected to play a more significant role in reducing borrowing costs during a crisis period. Our results indicate that the mitigating effect of EID on the cost of bank loan is indeed stronger in the financial crisis period (2007-2010), and family involvement weakens the relation between EID and the cost of bank loan in the post financial crisis period. Our primary findings are unchanged in multiple sets of robustness checks, such as using different EID measures and controlling for self-selection bias of EID.

This study extends the literature in the following aspects. First, although there is an increasing amount of research exploring the economic consequences of EID (Carroll and Niehaus, 1998; Anantharaman et al., 2014), our study is among the first to investigate the conditions under which the EID could have different influence on the cost of debt. Specifically, we document that family involvement weakens the relationship between EID and the cost of bank loans. Furthermore, this study contributes to the existing literature by considering the EID of CEO and CFO, as well as that of top management team (TMT). While CFOs are assumed to be responsible for key financial decisions, other TMT members may also influence their firms' decision-making processes. Unlike previous research, this paper not only considers the CEO but also other executive

officers, which further expands the breadth and depth of EID research. Second, this study also contributes to the literature on family business by investigating whether the moderating effect of family involvement is different among heterogeneous groups, such as those below and above aspiration level groups. This offers important practical implications to the leaders of the family business. For example, when the business performance is lower than expected, they can consider other ways than EID to subsidize the executives, so that they can stabilize the morale of the company and regain their strength. When business performance is higher than expected, family business leaders should consider using more EID than equity incentive to avoid equity dilution and loss of control, which is especially important for family businesses. Third, our paper examines the heterogeneous effect of family involvement by comparing the financial and post-financial crisis period, which enriches the literature by discussing the consequence of a financial crisis. Therefore, this study enriches the literature by taking a step further considering not only the effect of firm-level EID on cost of bank loan, but also the impact of external macroeconomic factors on this relationship. To sum up, this study highlights that the relation between EID and cost of bank loan conditioned on both business type and macroeconomic environment, providing practical implications that EID contribution should be managed appropriately under different circumstances to avoid increasing cost of bank loan.

The remainder of the paper is structured as follows. In Section 2, relevant literature is reviewed, and hypotheses are developed, followed by Section 3, which outlines our methodology, including the sample selection and the measurement of key variables. Empirical results are reported and discussed in Section 4. In Section 5, we set forth the conclusion.

2.2 Literature Review and Hypotheses

2.2.1 The Main Effect of Executive Inside Debt and the Cost of Debt

Three types of agency conflicts have been identified in the literature that result in adverse selection and moral hazard problems. The first type is the conflict between shareholders and managers, which stems from the separation of control and ownership. Agents (managers) pursue managerial private interests, whereas principals (owners) are more interested in monitoring manager behaviors and aligning manager's interest with those of shareholders' (Jensen and Meckling, 1976; Shleifer and Vishny, 1997). The second type is the agency conflict between large shareholders and minority shareholders. Large shareholders may use their control rights in the firm to extract private benefits at the expense of minority shareholders. The third type is the conflict between shareholders and debtholders. Shareholders are more likely to choose high payoffs and risky projects due to their unlimited return potential, while debtholders tend to be more risk-averse due to their fixed claim on the net assets of the firm (Jensen and Meckling, 1976; Ahmed *et al.,* 2002).

Existing studies have documented that managerial compensation, especially equity-based compensation, plays a significant role in attenuating the first type of agency cost between managers and shareholders as equity compensation aligns managers' benefits with shareholders' long-term valuations. But equity compensation (e.g., stock options) can induce managers to undertake riskier investments; this may benefit shareholders at the expense of debtholders (Jensen and Meckling, 1976; Guay, 1999). To reduce the first and third types of agency problem (managers-shareholders conflict and shareholders-debtholders conflict), firms provide managers with both equity and debt-like compensation, such as deferred components in their compensation packages and defined-benefit pensions firms promise to pay a predetermined amount in the future (Sundaram and

Yermack, 2007). As these plans are generally unfunded and unsecured,[1] executives are exposed to the default risk that are similar to those of outside debtholders, and they are likely to align their interests with debtholders' interests (Edmans and Liu, 2011).

The literature on EID confirms the above theoretical prediction. A growing number of studies show that higher EID results in less aggressive accounting policies and better earnings quality (Chen et al., 2010; He, 2015), lower stock volatility and default risk (Wei and Yermack, 2011), more conservative financial and debt policies (Cassell et al., 2012; Srivastav *et al.,* 2014), and higher liquidity value (Wei and Yermack, 2011; Hoang, 2013). Prior research has also documented that EID reduces the yield spread and the number of debt covenants in loan contracts (Chava et al., 2009; Anantharaman et al., 2014); this echoes the expectation that EID holdings more closely align managers' interests and the debtholders' interests. To sum up, inside debt can motivate executives to engage in less risky projects, and thereby mitigate the conflicts between executives and debtholders, whose interests would be equally jeopardized by the bankruptcy of the firm (Kabir *et al.,* 2013).

2.2.2 The Moderating Effect of Family Involvement

Previous research has documented that family firms and their non-family peers differ in a number of ways, including risk preference (Morck *et al*., 1998; Anderson *et al.*, 2012), social and

[1] Unfunded means that firm never really allocates money to the pension or deferred compensation plans before the retirement or resignation, despite the fact that the accounts aggregate with the stated asset allocation. Unsecured means that executives may not be able to receive full benefits, just as unsecured outside debtholders won't if the firm goes bankrupt. When a firm goes bankrupt, it cannot contribute to the plan any longer, and the CEO may lose the benefit under these pension plans.

environmental performance (Bingham *et al.*, 2011; Cui *et al.,* 2018), financial reporting quality (Wang, 2006; Chen et al., 2010; Martin et al., 2016), and performance and operating efficiency (McConaughy *et al.*, 1998; McConaughy *et al.*, 2001). Wang (2006) discusses two competing effects of family ownership on earnings management incentives. The entrenchment effect suggests that family-owned firms are more likely to manipulate earnings opportunistically through their control rights than non-family firms, while the alignment effect implies the opposite because family-owned firms are concerned about the family's reputation and long-term survival. The entrenchment argument is consistent with the second type of agency conflict that family owners are motivated to expropriate minority shareholders. The support for the alignment effect is based on the argument that the longer decision horizon and the motivation to preserve family image could motivate family firms to build long-term relationships with stakeholders, including debtholders. Thus, it would mitigate the third type of agency conflict between shareholders and debtholders.

The effects of EID holding, as well as those of family involvement, on the cost of debt financing have been well-addressed (Anderson et al., 2003; Chava et al., 2009; Chua et al., 2011; Anantharaman et al., 2014). However, the moderating effect of family involvement on the association between EID and the cost of debt hasn't been explored. Family firm owners usually occupy important management and governance positions in the firm, which enables them to influence the firm's operations (Fama and Jensen, 1983). We suggest that family involvement serves as a potential substitution mechanism to EID in lowering the cost of debt. Family owners generally hold undiversified investments and would like to pass the control of their firms on to the next generation. The survival of the firm is of paramount importance for family owners, so they pay greater attention to long-term goals, and are less likely to expropriate firm's resources at the

expense of other stakeholders such as creditors (Hillier *et al*., 2018). Compared with non-family firms, family firms tend to be more risk averse, so we expect that in family firms EID plays a less important role in reducing the agency conflict between shareholders and debtholders. Therefore, we hypothesize:

H1: The mitigating effect of EID on the cost of debt is attenuated in family firms.

2.2.3 The Moderating Effect of Past Performance

Previous studies have recognized the heterogeneity among family firms with regard to their risk-taking appetite (Chrisman *et al*., 2009). Mahto and Khanin (2015) explore how aspiration level affects a firm's goal setting and future performance expectations. Their results show that the satisfaction with past performance in family firms is associated with lower risk-taking. When a family firm has achieved satisfactory performance, it is less likely to default, which lowers its cost of debt. In contrast, poor past performance heightens family firm's fear of losing wealth and control (Berrone *et al*., 2012) because once it goes bankrupt, the family loses its entire socioemotional wealth (Chrisman and Patel, 2012; Chua et al., 2015). Accordingly, we expect that when a firm's past performance is lower than its aspiration level, the firm will become more aggressive in investment strategies and financing policies, which harms creditors' interests. Creditors will reasonably incorporate such information into borrowing decision making and charge a higher interest on loans. Under such circumstance, EID can play a vital role in reducing the cost of bank loans because debt-like compensation can better align the interests of executives and creditors. So, our prediction is that, when firm performance is below its aspiration level, the effect of EID on reducing the cost of debt becomes stronger. Because a family firm is more aggressive in risk-taking when its performance is below aspiration level, family involvement plays a less

prominent role in reducing the impact of EID on the cost of debt. This leads to our second and third hypothesis:

H2: The negative impact of EID on the cost of debt becomes stronger when firm's performance is below its aspiration level.

H3: The moderating effect of family involvement on the association between EID and the cost of debt becomes weaker when firm's performance is below its aspiration level.

2.3 Methodology

2.3.1 Sample Selection Process

The data used in this study are collected from a number of databases: DealScan, Execucomp, Compustat, CRSP, and the Federal Reserve Bank of St. Louis. Our sample period is from 2007 to 2016, because the mandatory disclosure on managers' deferred compensation holdings is a key feature of the SEC's 2006 expansion of executive compensation disclosure. Our data collection starts with bank loans from DealScan and then, we obtain EID information from Execucomp. We also obtain the list of family firms in the largest 2,000 U.S. firms used in Anderson et al. (2012). We exclude financial and utility firms as they are regulated by different policies; Finally, observations with missing value to calculate control variables are eliminated. The final sample consists of 4, 180 loans, 900 of which are from family firms while 3, 280 are from non-family firms.

2.3.2 Variable Measurements

Existing studies suggest that EID could effectively mitigate executive-debtholder agency conflicts, and that the alignment effects are more pronounced when the executives' personal

leverage to the firm's leverage is higher than one (Anantharaman et al., 2014; He, 2015). This study constructs two measures to proxy for the EID of CEO for this study; One of them is CEO relative leverage (*CEOD1*), calculated as CEO's personal leverage as a ratio of the firm's leverage,

$$CEO\ relative\ leverage = (CEOD/CEOE)/(FD/FE),$$

where *CEOD* is the EID holding of a CEO, measured as the present value of accumulated pension benefits plus the aggregate balance in deferred compensation. *CEOE* consists of stock value and stock option value. The value of the CEO's stock holding is calculated by the number of shares held multiplied by the year-end closing market price per share. The aggregate option value is the summation of each tranche value. Each tranche option value is measured as the number of stock options multiplied by the option value per unit, which is calculated following the modified Black-Scholes model by Merton (1973). *FD* refers to total firm debt, and *FE* is the market value of firm equity.

$$Option\ value = Se^{-dT}N(Z) - Xe^{-dT}N\left(Z - \sigma T^{(1/2)}\right)$$

Where $Z = [ln(S/X) + T(r - d + \sigma^2/2)]/\sigma T^{(1/2)}$, N is the cumulative probability function for the normal distribution, *S* is the underlying stock's fiscal year-end price, X is the option exercise price, σ is the expected stock return volatility over the option's lifetime, r is the natural logarithm of one plus risk-free interest rate, T is the number of years until the stock option expires, d is the natural logarithm of one plus expected dividend yield over the option's lifetime. We obtained the fiscal year-end price (S) from Compustat. The stock return volatility (σ) is estimated by using the previous 60 months' stock return from CRSP. The risk-free rate (r) is 3-month Treasury Bill rates from St. Louis Fed. The dividend yield (d) is the average of the previous 5 years' dividend yield from COMPUSTAT, d is winsorized at the 1st and 99th percentiles. We

obtained X and T from Execucomp. X set equal to *expric* from Execucomp. T equal to (year (*exdate*) – *year* + (month (*exdate*)-7)/12).

The second measure is the relative incentive ratio of a CEO ($CEOD2$)*:*

$$CEO\ relative\ incentive\ ratio\ =\ (\Delta CEOD/\Delta CEOE)/(\Delta FD/\Delta FE),$$

Where $\Delta CEOD$ is equal to *CEOD*, CEO inside debt holding; $\Delta CEOE$ is CEO's total delta and measured as follows: $\Delta CEOE = S + \Sigma_i N_i(\Delta N_i)$, S is the number of CEO stock holding times stock delta (assumed to be 1), N_i represents the number of CEO options holding, and ΔN_i is the number of option delta per unit in each tranche. ΔFD is the total debt, while ΔFE is measured as the number of common shares outstanding times stock delta (assumed to be 1) plus the firm's total option delta, and constructed in the same way as that used for $\Delta CEOE$, except that not all data on outstanding option are available. Instead, following Core and Guay (2002), we use the total number of outstanding employee stock options (*optosey* from Coumpustat), the average exercise price of outstanding options (*optprcby* from Compustat), and assume that the average time-to-maturity is 4 years for all options. We calculate option delta per unit as follows:

$$[\partial(option\ value)/\partial(S)] * (S/100) = e^{-dT}N(Z) * (S/100)$$

where *N(Z)* is cumulative probability function for the normal distribution, *S* is the end of year stock price, T is the time-to-maturity of the stock option in years, *d* is the natural logarithm of one plus expected dividend yield over the life of the option.

We also calculate the CEO and CFO inside debt (*CEOCFOD1, CEOCFOD2*), as well as the top management team (TMT) inside debt (*TMTD1, TMTD2*), in a similar way.

Cost of debt (*Spread*) is the natural log of one plus all-in-drawn spread from DealScan. All-in-drawn spread is the interest rate the borrower pays over LIBOR (London Interbank Offered

Rate) for each dollar drawn down (Kamstra *et al*., 2013; Francis *et al*., 2020; Gottesman and Roberts, 2004). Family involvement (*FAM*) is a binary variable. Following Anderson et al. (2012), we define family firm as firms with family members owning at least 5% stake of shares. Table 2.1 summarizes the definitions of all variables in the analysis.

Table 2.1 Variable Definitions

Variables	Definitions	Sources
Main variables		
Spread	The natural log of one plus all-in-drawn spread, where all-in-drawn spread is the interest rate the borrower pays in basis points over LIBOR (London Interbank Offered Rate) for each dollar drawn down.	DealScan
FAM	A binary variable, equal to 1 if the firm is classified as a family firm, and 0 otherwise.	Anderson et al. (2012)
CEOD1	The natural log of one plus CEO relative leverage. $CEO\ relative\ leverage = (CEOD/CEOE)/(FD/FE)$, where *CEOD* is CEO inside debt holding, including the present value of accumulated pension benefits and aggregate balance in deferred compensation. *CEOE* is CEO equity holding, consisting of the value of stock and stock options. The stock value is measure by the number of stock shares times the fiscal year-end stock price. The CEO's option value is the sum of each tranche option value, which is calculated by multiplying the option value by the number of stock options. We calculate value for each option tranche based on the modified Black-Scholes model and Merton (1973). *FD* is the total debt while *FE* is the market value of equity.	Execucomp, CRSP, Compustat, Federal Reserve Bank of ST. Louis
CEOD2	The natural log of one plus CEO relative incentive ratio. $CEO\ relative\ incentive\ ratio = (\Delta CEOD/\Delta CEOE)/(\Delta FD/\Delta FE)$, where $\Delta CEOD$ is equal to *CEOD*, CEO inside debt holding; $\Delta CEOE$ is CEO's total delta and measured as follows: $\Delta CEOE = S + \Sigma_i N_i(\Delta N_i)$, *S* is the number of CEO stock holding times stock delta (assumed to be 1), N_i and ΔN_i are the number of CEO options holding and option delta per unit in each tranche. ΔFD is the total debt, while ΔFE is measured as the number of common shares outstanding times stock delta (assumed to be 1) plus the firm's total option delta, and constructed in the same way as that used for $\Delta CEOE$, except that not all data on outstanding option are available. Instead, following Core and Guay (2002), we use the total number of outstanding employee stock options (*optosey* from Coumpustat), the average exercise price of outstanding options (*optprcby* from Compustat), and assume that the average time-to-maturity is 4 years for all options.	
CEOCFOD1	The natural log of one plus CEO and CFO relative leverage. $CEO\ and\ CFO\ relative\ leverage = (CEOCFOD/CEOCFOE)/(FD/FE)$, where *CEOCFOD* is CEO and CFO inside debt holding, including the present value of accumulated pension benefits and aggregate balance in deferred compensation. *CEOCFOE* is CEO and CFO equity holding, consisting the value of stock and stock options. The calculation of CEO and CFO relative leverage is similar to that of CEO relative leverage.	
CEOCFOD2	The natural log of one plus CEO and CFO relative incentive ratio. $CEO\ and\ CFO\ relative\ incentive\ ratio = (\Delta CEOCFOD/\Delta CEOCFOE)/(\Delta FD/\Delta FE)$, where $\Delta CEOCFOD$ is equal to *CEOCFOD*, $\Delta CEOCFOE$ is the sum of the number of CEO and CFO stock holding and the aggregate option delta. The calculation of CEO and CFO relative incentive ratio is similar to that of CEO relative incentive ratio.	
TMTD1	The natural log of one plus TMT relative leverage. $TMT\ relative\ leverage = (TMTD/TMTE)/(FD/FE)$, where *TMTD* is TMT inside debt holding, including the present value of accumulated pension benefits and aggregate balance	

	in deferred compensation. *TMTE* is TMT equity holding, consisting of the value of stock and stock options. The calculation of TMT relative leverage is similar to that of CEO relative leverage.	
TMTD2	The natural log of one plus TMT relative incentive ratio. $TMT\ relative\ incentive\ ratio = (\Delta TMTD/\Delta TMTE)/(\Delta FD/\Delta FE)$, where $\Delta TMTD$ is equal to *TMTD*, $\Delta TMTE$ is the sum of the number of TMT stock holding and product of the number of TMT stock options and the aggregate option delta. The calculation of TMT relative incentive ratio is similar to that of CEO relative incentive ratio.	
Control variables		
FirmSize	The natural log of one plus the firm's total assets.	Compustat
ROA	Return on assets is the ratio of income before extraordinary items to total assets.	Compustat
Leverage	The ratio of total debt to total assets.	Compustat
MTB	The market value of assets divided by total assets, where the market value of assets is measured as (the market value of equity + preferred Stock value + debt in current liabilities + long-term debt − deferred taxes and Investment tax credit).	Compustat
SDofCF	Standard deviation of net operating cash flows over the past four years.	Compustat
LiqCon	Liquidity constraints, an indicator variable set equal to one if the firm generates negative operating cash flow, and zero otherwise.	Compustat
Tenure	The natural log of one plus CEO's tenure in months.	Execucomp
LoanSize	The natural log of one plus the loan's amount.	DealScan
Maturity	The natural log of one plus the maturity of the loan in months.	DealScan
NLender	The natural log of one plus the number of lenders involving in a loan.	DealScan
Security	A binary variable, equal to 1 if the loan has collateral and 0 otherwise.	DealScan
Instrumental Variables		
TWage *TMortgage* *TGain*	Maximum state tax rate for wages, mortgage subsidy, and long-term capital gains.	National Bureau of Economic Research

Note: This table reports the definitions of all the variables used in Essay 1. All the continuous variables are winsorized at the 1% level

2.3.3 The Empirical Model

We use Equation (1) below to analyze the EID-cost of bank loans relationship, but our inference might be influenced by a potential selection bias problem. For instance, executives in family firms may have lower inside debt because family firms is less inclined to grant executives EID, or because family firms are less inclined to disclose EID data. To address this selection bias issue, we apply the Heckman two-stage linear squares regressions (Heckman, 1977). In the first stage (Equation 2), we predict the firm's probability of granting EID and the probability of reporting such information with instrumental variables. We adopt three variables published by the National Bureau of Economic Research, the maximum state tax rate for personal incomes (*TWage*), mortgage subsidy (*TMortgage*), and long-term capital gains (*TGain*), as instruments. The underlying argument is that these instrument variables would affect the EID, but would not affect the cost of debt (Belkhir and Boubaker, 2013; Anantharaman et al., 2014; He, 2015). Specifically, top executives subject to higher rates of income tax, mortgage subsidy, and long-term capital gains are highly motivated to defer personal income through EID; while these state-level rates do not directly affect the yield spread of bank loan. In the second stage, inverse mills ratios are included as a control variable to alleviate concerns about selection bias.

The interaction term between predicted EID and family involvement is added to Equation (3) to test the moderating role of family involvement (H1). Following previous studies, we include firm-level and bank loan-level control variables (He, 2015; Chen and Fan, 2017; François and Missonier-Piera, 2007; Gottesman and Roberts, 2004; Gottesman and Roberts, 2007; Sherrill and Yerkes, 2018). The definitions for all variables are summarized in Table 2.1. To mitigate the concern of reverse causality, family involvement, EID and other firm-level variables are those

from year *t-1* and bank loan spread (*Spread)* and bank loan related variables are collected from year *t*. Continuous variables are winsorized at the top and bottom1% level.

$$Spread = \beta_0 + \beta_1 CEOD1 + \beta_2 Controls + \epsilon_1 \quad (1)$$

$$CEOD1 = \beta_0 + \beta_1 FAM + +\beta_2 TWage + \beta_3 TMortgage + \beta_4 TGain + \beta_5 Controls + \epsilon_1 \quad (2)$$

$$Spread = \beta_0 + \beta_1 \widehat{CEOD1} + \beta_2 FAM + +\beta_3 \widehat{CEOD1} * FAM + \beta_4 Controls + \epsilon_1 \quad (3)$$

To test H2 and H3, we follow prior studies (i.e., Chrisman and Patel, 2012) and use the average industry ROA (based on two-digit SIC) and historical ROA as the proxy of firm's aspiration level. The entire sample was then divided into two subsamples: the above aspiration subsample consisting of firms whose performance is higher than the industry median/historical ROA, and the below aspiration subsample consisting of firms whose performance is lower than the industry median/historical ROA. Then we run equation (3) in two subsamples and compare the results.

2.4 Empirical Results

The average bank loan spread is 161.26 basis points over LIBOR. The mean values of *CEOD1* (take natural logarithm) and *CEOD2* (the natural logarithm of CEO relative incentive ratio plus one) are 0.610 and 0.636, respectively. The statistics of these two variables are in line with Cassell et al. (2012) and He (2015). See Table 2.2 for descriptive statistics of the full sample, as well as the family-firm and the non-family-firm subsamples. On average, family firms grant executives less inside debt, and family and non-family firms differ significantly in size, leverage,

standard deviation of net operating cash flow, CEO tenure, and the average loan size.[2]

As tabulated in the correlation Table (Table 2.3), the cost of debt (*Spread*) is negatively associated with EID. The correlation between EID and family involvement is significantly negative, demonstrating that family firms provide executives with less inside debt. In addition, the cost of debt (*Spread)* is negatively correlated with firm size (*FirmSize*), the accounting return measured by *ROA*, Tobin's Q measured by the market-to-book ratio (*MTB*), loan size, and number of lenders; it is positively associated with debt ratio (*Leverage*), liquidity constraint (*LiqCon*), and loan maturity (*Maturity*).

[2] We also compared the difference in CEO inside debt, cost of bank loan for family firms between above and below the median industry ROA. The results indicate that *CEOD1* is higher, and the cost of bank loan is lower in the above aspiration level group for family firms. The t-tests suggests that the differences in CEO inside debt and cost of bank loan for family firms are significant between the above and below aspiration level subsamples.

Table 2.2 Descriptive Statistics

Variables	Full sample						FAM=0			FAM=1			Difference (0-1)	
	n	Mean	S.D.	25%	Mdn	75	n	Mean	Mdn	n	Mean	Mdn	t-test	ranksum
Spread	4,180	5.083	0.685	4.732	5.142	5.525	3,280	5.072	5.097	900	5.124	5.170	-0.052**	-0.073*
FAM	4,180	0.215	0.411	0.000	0.000	0.000	-	-	-	-	-	-	-	-
CEOD1	4,180	0.610	0.784	0.010	0.311	0.914	3,280	0.651	0.380	900	0.462	0.095	0.189***	0.285***
CEOD2	4,180	0.636	0.810	0.013	0.344	0.963	3,280	0.678	0.397	900	0.480	0.104	0.198***	0.293***
CEOCFOD1	4,180	0.637	0.790	0.033	0.358	0.958	3,280	0.682	0.434	900	0.474	0.133	0.209***	0.301***
CEOCFOD2	4,180	0.664	0.813	0.041	0.393	0.991	3,280	0.711	0.461	900	0.493	0.137	0.218***	0.324***
TMTD1	4,180	0.700	0.801	0.076	0.445	1.046	3,280	0.759	0.533	900	0.485	0.164	0.274***	0.369***
TMTD2	4,180	0.727	0.817	0.090	0.480	1.090	3,280	0.790	0.578	900	0.499	0.164	0.291***	0.414***
FirmSize	4,180	8.270	1.306	7.370	8.180	9.087	3,280	8.384	8.329	900	7.855	7.703	0.529***	0.626***
ROA	4,180	0.040	0.090	0.023	0.051	0.079	3,280	0.039	0.051	900	0.045	0.051	-0.005	0.000
Leverage	4,180	0.243	0.136	0.150	0.230	0.320	3,280	0.239	0.228	900	0.255	0.241	-0.016***	-0.013*
MTB	4,180	0.832	0.295	0.622	0.783	0.995	3,280	0.831	0.784	900	0.838	0.777	-0.007	0.007
SDofCF	4,180	364.639	656.273	62.951	142.277	333.956	3,280	400.035	157.099	900	235.641	99.392	164.395***	57.707***
LiqCon	4,180	0.047	0.211	0.000	0.000	0.000	3,280	0.045	0.000	900	0.053	0.000	-0.009	0.000
Tenure	4,180	4.021	1.044	3.466	4.190	4.754	3,280	3.943	4.094	900	4.306	4.489	-0.363***	-0.395***
LoanSize	4,180	19.805	1.230	19.114	19.807	20.723	3,280	19.865	19.925	900	19.585	19.673	-0.045**	0.252***
Maturity	4,180	3.889	0.528	3.892	4.111	4.977	3,280	3.878	4.111	900	3.926	4.111	0.281***	0.000
NLender	4,180	10.244	7.413	5.000	8.000	13.000	3,280	10.308	9.000	900	10.009	8.000	0.299	1.000***
Security	4,180	0.422	0.494	0.000	0.000	1.000	3,280	0.410	0.000	900	0.467	0.000	-0.057***	0.000***

Note: This table shows summary statistics for all variables for the full sample, as well as the family-firm and the non-family-firm subsamples. *Spread* is the natural log of one plus all-in-drawn spread, where all-in-drawn spread is the interest rate the borrower pays in basis points over LIBOR (London Interbank Offered Rate) for each dollar drawn down. *FAM* is equal to 1 if the firm is classified as a family firm, and 0 otherwise. *CEOD1* is the natural log of one plus CEO relative leverage. *CEOD2* is the natural log of one plus CEO relative incentive ratio. *CEOCFOD1* is the natural log of one plus CEO and CFO relative leverage. *CEOCFOD2* is the natural log of one plus CEO and CFO relative incentive ratio. *TMTD1* is the natural log of one plus TMT relative leverage. *TMTD2* is the natural log of one plus TMT relative incentive ratio. *FirmSize* is the natural log of one plus the firm's total assets. *ROA* is the ratio of income before extraordinary items to total assets. *Leverage* is the ratio of total debt to total assets. *MTB* is the market value of assets divided by total assets. *SDofCF* is the standard deviation of net operating cash flows over the past four years. *LiqCon* is liquidity constraints, an indicator variable set equal to one if the firm generates negative operating cash flow, and zero otherwise. *Tenure* is the natural log of one plus CEO's tenure in months. *LoanSize* is the natural log of one plus the loan's amount. *Maturity* is the natural log of one plus the maturity of the loan in months. *NLender* is the natural log of one plus the number of lenders involving in a loan. *Security* is equal to 1 if the loan has collateral, and 0 otherwise. *, **, and *** represent significance at 10%, 5% and 1% levels, respectively.

Table 2.3 Pearson Correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Spread	1									
FAM	0.031**	1								
CEOD1	-0.238***	-0.099***	1							
CEOD2	-0.190***	-0.100***	0.976***	1						
CEOCFOD1	-0.245***	-0.109***	0.959***	0.937***	1					
CEOCFOD2	-0.201***	-0.110***	0.936***	0.948***	0.982***	1				
TMTD1	-0.252***	-0.141***	0.870***	0.844***	0.916***	0.894***	1			
TMTD2	-0.207***	-0.147***	0.848***	0.853***	0.899***	0.910***	0.983***	1		
FirmSize	-0.314***	-0.167***	0.091***	0.040**	0.075***	0.024	0.069***	0.013	1	
ROA	-0.380***	0.024	0.135***	0.107***	0.144***	0.120***	0.154***	0.128***	0.074***	1
Leverage	0.271***	0.049***	-0.330***	-0.336***	-0.358***	-0.361***	-0.392***	-0.394***	0.097***	-0.236***
MTB	-0.400***	0.010	0.160***	0.108***	0.163***	0.116***	0.183***	0.137***	-0.027*	0.476***
SDofCF	-0.370***	-0.103***	0.132***	0.088***	0.132***	0.090***	0.132***	0.088***	0.712***	0.086***
LiqCon	0.131***	0.017	-0.061***	-0.051***	-0.060***	-0.045***	-0.061***	-0.046***	-0.114***	-0.284***
Tenure	-0.030*	0.143***	0.001	-0.002	-0.017	-0.018	-0.094***	-0.098***	-0.011	0.093***
LoanSize	-0.325***	-0.094***	0.094***	0.052***	0.090***	0.048***	0.071***	0.029*	0.657***	0.161***
Maturity	0.125***	0.037**	-0.094***	-0.076***	-0.087***	-0.065***	-0.084***	-0.063***	-0.195***	0.060***
NLender	-0.163***	-0.017	0.029*	0.005	0.016	-0.005	0.008	-0.017	0.347***	0.126***
Security	0.484***	0.047***	-0.184***	-0.143***	-0.187***	-0.148***	-0.185***	-0.145***	-0.274***	-0.279***

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Leverage	1								
MTB	-0.034*	1							
SDofCF	-0.052***	0.037**	1						
LiqCon	0.088***	-0.170***	-0.037**	1					
Tenure	0.022	0.064***	-0.007	-0.027*	1				
LoanSize	0.053***	0.139***	0.496***	-0.109***	0.020	1			
Maturity	0.034**	-0.015	-0.234***	-0.052***	0.034**	-0.081***	1		
NLender	-0.008	0.025	0.195***	-0.098***	0.041***	0.364***	0.090***	1	
Security	0.208***	-0.269***	-0.239***	0.151***	-0.036**	-0.227***	0.184***	-0.116***	1

Note: This table presents Pearson correlations. *Spread* is the natural log of one plus all-in-drawn spread, where all-in-drawn spread is the interest rate the borrower pays in basis points over LIBOR (London Interbank Offered Rate) for each dollar drawn down. *FAM* is equal to 1 if the firm is classified as a family firm, and 0 otherwise. *CEOD1* is the natural log of one plus CEO relative leverage. *CEOD2* is the natural log of one plus CEO relative incentive ratio. *CEOCFOD1* is the natural log of one plus CEO and CFO relative leverage. *CEOCFOD2* is the natural log of one plus CEO and CFO relative incentive ratio. *TMTD1* is the natural log of one plus TMT relative leverage. *TMTD2* is the natural log of one plus TMT relative incentive ratio. *FirmSize* is the natural log of one plus the firm's total assets. *ROA* is the ratio of income before extraordinary items to total assets. *Leverage* is the ratio of total debt to total assets. *MTB* is the market value of assets divided by total assets. *SDofCF* is the standard deviation of net operating cash flows over the past four years. *LiqCon* is liquidity constraints, an indicator variable set equal to one if the firm generates negative operating cash flow, and zero otherwise. *Tenure* is the natural log of one plus CEO's tenure in months. *LoanSize* is the natural log of one plus the loan's amount. *Maturity* is the natural log of one plus the maturity of the loan in months. *NLender* is the natural log of one plus the number of lenders involving in a loan. *Security* is equal to 1 if the loan has collateral, and 0 otherwise. *, **, and *** represent significance at 10%, 5% and 1% levels, respectively.

2.4.1 The Moderating Effect of Family Involvement

Table 2.4 reports the effect of EID holding on the cost of bank loans by using the OLS regression. Column 1 shows that, the coefficient on CEO inside debt is significantly negative, indicating that higher EID holding leads to a lower cost of bank loan. Our interpretation is that EID exposes CEOs to the similar risks to creditors, therefore reduces their risk-taking appetite. Granting more EID effectively aligns the interests between executives and creditors, and therefore the creditors are willing to charge lower interest to such firms. Columns 1 and 2 of Table 2.4 provide evidence that are in accordance with those documented in Anantharaman et al. (2014). In Columns 3 and 4, we use CEO plus CFO inside debt to replace CEO inside debt, and in Columns 5 and 6 we use TMT inside debt to replace CEO inside debt. The results are broadly consistent with those in Columns 1 and 2.

To address the endogeneity issue between family involvement and EID, we apply a 2SLS approach. Tables 2.5 and 2.6 summarize the first- and second-stage results, respectively, and the coefficients on EID are significant and negative, indicating that family firms are less likely to grant EID than their non-family counterparts. It is possible that family members could influence

Table 2.4 The Effect of Executive Inside Debt on the Cost of Bank Loan

VARIABLES	(1) *Spread*	(2) *Spread*	(3) *Spread*	(4) *Spread*	(5) *Spread*	(6) *Spread*
CEOD1	-0.030***					
	(0.006)					
CEOD2		-0.021**				
		(0.039)				
CEOCFOD1			-0.036***			
			(0.001)			
CEOCFOD2				-0.027***		
				(0.006)		
TMTD1					-0.037***	
					(0.001)	
TMTD2						-0.028***
						(0.006)
FAM	-0.039**	-0.038**	-0.040**	-0.040**	-0.042**	-0.042**
	(0.043)	(0.048)	(0.034)	(0.037)	(0.028)	(0.031)
FirmSize	-0.029***	-0.030***	-0.030***	-0.030***	-0.029***	-0.030***
	(0.009)	(0.007)	(0.008)	(0.006)	(0.009)	(0.007)
ROA	-0.506***	-0.505***	-0.504***	-0.502***	-0.505***	-0.504***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Leverage	0.582***	0.597***	0.565***	0.580***	0.553***	0.571***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
MTB	-0.485***	-0.491***	-0.482***	-0.489***	-0.479***	-0.486***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SDofCF	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LiqCon	0.068*	0.067*	0.068*	0.068*	0.069*	0.068*
	(0.074)	(0.077)	(0.072)	(0.073)	(0.071)	(0.073)
Tenure	0.004	0.004	0.003	0.003	0.001	0.002
	(0.594)	(0.606)	(0.627)	(0.625)	(0.863)	(0.817)
LoanSize	-0.037***	-0.037***	-0.036***	-0.036***	-0.037***	-0.037***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Maturity	0.034	0.035*	0.034*	0.035*	0.035*	0.035*
	(0.102)	(0.096)	(0.100)	(0.093)	(0.097)	(0.092)
NLender	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***
	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)
Security	0.374***	0.375***	0.373***	0.374***	0.374***	0.375***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	5.521***	5.526***	5.524***	5.528***	5.546***	5.546***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,180	4,180	4,180	4,180	4,180	4,180
Adj. R^2	0.581	0.581	0.582	0.581	0.582	0.581

Note: This table reports the effects of EID on cost of bank loan. *Spread* is the natural log of one plus all-in-drawn spread, where all-in-drawn spread is the interest rate the borrower pays in basis points over LIBOR (London Interbank Offered Rate) for each dollar drawn down. *FAM* is equal to 1 if the firm is classified as a family firm, and 0 otherwise. *CEOD1* is the natural log of one plus CEO relative leverage. *CEOD2* is the natural log of one plus CEO relative incentive ratio. *CEOCFOD1* is the natural log of one plus CEO and CFO relative leverage. *CEOCFOD2* is the natural log of one plus CEO and CFO relative incentive ratio. *TMTD1* is the natural log of one plus TMT relative leverage. *TMTD2* is the natural log of one plus TMT relative incentive ratio. *FirmSize* is the natural log of one plus the firm's total assets. *ROA* is the ratio of income before extraordinary items to total assets. *Leverage* is the ratio of total debt to total assets. *MTB* is the market value of assets divided by total assets. *SDofCF* is the standard deviation of net operating cash flows over the past four years. *LiqCon* is liquidity constraints, an indicator variable set equal to one if the firm generates negative operating cash flow, and zero otherwise. *Tenure* is the natural log of one plus CEO's tenure in months. *LoanSize* is the natural log of one plus the loan's amount. *Maturity* is the natural log of one plus the maturity of the loan in months. *NLender* is the natural log of one plus the number of lenders involving in a loan. *Security* is equal to 1 if the loan has collateral, and 0 otherwise. Year and industry dummies are included. P-values are reported in parentheses. *, **, and *** represent significance at 10%, 5% and 1% levels, respectively.

Table 2.5 1st Stage: The Effect of Family Involvement on Executive Inside Debt

VARIABLES	(1) *CEOD1*	(2) *CEOD2*	(3) *CEOCFOD1*	(4) *CEOCFOD2*	(5) *TMTD1*	(6) *TMTD2*
FAM	-0.160***	-0.192***	-0.180***	-0.214***	-0.228***	-0.271***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
FirmSize	0.057***	0.036**	0.039***	0.016	0.034**	0.007
	(0.000)	(0.011)	(0.004)	(0.269)	(0.014)	(0.646)
ROA	-0.087	-0.082	-0.001	0.043	-0.052	-0.028
	(0.616)	(0.654)	(0.993)	(0.812)	(0.783)	(0.882)
Leverage	-2.056***	-2.167***	-2.189***	-2.270***	-2.429***	-2.489***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
MTB	0.418***	0.287***	0.419***	0.294***	0.495***	0.378***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SDofCF	0.000	0.000	0.000**	0.000*	0.000***	0.000**
	(0.184)	(0.451)	(0.021)	(0.052)	(0.007)	(0.018)
LiqCon	0.041	0.029	0.044	0.050	0.045	0.047
	(0.450)	(0.609)	(0.416)	(0.387)	(0.423)	(0.427)
Tenure	0.018*	0.018	0.005	0.007	-0.053***	-0.055***
	(0.099)	(0.101)	(0.600)	(0.509)	(0.000)	(0.000)
TWage	0.069***	0.084***	0.067***	0.082***	0.057***	0.074***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TMorgage	-0.018***	-0.017***	-0.016***	-0.015***	-0.019***	-0.018***
	(0.000)	(0.001)	(0.001)	(0.002)	(0.000)	(0.000)
TGain	-0.049***	-0.063***	-0.046***	-0.060***	-0.034**	-0.050***
	(0.003)	(0.000)	(0.003)	(0.000)	(0.012)	(0.001)
Constant	-0.066	0.219	0.146	0.445***	0.509***	0.845***
	(0.632)	(0.127)	(0.300)	(0.002)	(0.000)	(0.000)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,180	4,180	4,180	4,180	4,180	4,180
Adj. R^2	0.208	0.188	0.220	0.201	0.261	0.243

Note: This table reports the first stage regressions of EID on family involvement. *CEOD1* is the natural log of one plus CEO relative leverage. *CEOD2* is the natural log of one plus CEO relative incentive ratio. *CEOCFOD1* is the natural log of one plus CEO and CFO relative leverage. *CEOCFOD2* is the natural log of one plus CEO and CFO relative incentive ratio. *TMTD1* is the natural log of one plus TMT relative leverage. *TMTD2* is the natural log of one plus TMT relative incentive ratio. *FAM* is equal to 1 if the firm is classified as a family firm, and 0 otherwise. *FirmSize* is the natural log of one plus the firm's total assets. *ROA* is the ratio of income before extraordinary items to total assets. *Leverage* is the ratio of total debt to total assets. *MTB* is the market value of assets divided by total assets. *SDofCF* is the standard deviation of net operating cash flows over the past four years. *LiqCon* is liquidity constraints, an indicator variable set equal to one if the firm generates negative operating cash flow, and zero otherwise. *Tenure* is the natural log of one plus CEO's tenure in months. *LoanSize* is the natural log of one plus the loan's amount. *Maturity* is the natural log of one plus the maturity of the loan in months. *NLender* is the natural log of one plus the number of lenders involving in a loan. *Security* is equal to 1 if the loan has collateral, and 0 otherwise. *TWage*, *TMortgage* and *TGain* are maximum state tax rates for wages, mortgage subsidy, and long-term capital gains. Year and industry dummies are included. P-values are reported in parentheses. *, **, and *** represent significance at 10%, 5% and 1% levels, respectively.

corporate decision-making through mechanisms such as setting up a dual-class share structure and engaging directly in management and governance (Gómez-Mejía *et al*., 2007). Contrarily, non-family firms do not possess these advantages to monitor executive risk-taking behavior.

The coefficients on the instrumental variables *TWage* and *TMortgage* are in line with Anantharaman et al. (2014) and He (2015). Specifically, executives from firms that are located in higher maximum wage tax rate states (*TWage*) are more likely to accept debt-like compensation since they can defer income tax and enjoy a lower income tax rate. Executives from firms with higher maximum mortgage subsidy rates *(TMortgage*) are less likely to accept deferred compensations because the mortgage subsidy can be deducted before taxes and thereby reduce executives' tax burdens. However, when executives face a higher tax rate for capital gains (*TGain*), they are more willing to accept cash bonuses rather than equity-based incentives. The null hypothesis that there is no relation between the instrument variables and executive inside debt received strong rejection by the heteroskedastic-robust Kleibergen-Paap LM statistic (rk = 27.11, p = 0.000 when we use *CEOD1*) for the underidentification test. In addition, the Sargan's (j = 2.57, p = 0.276 when we use *CEOD1*) and Basmann's chi-squared statistics (j = 2.54, p = 0.281 when we use *CEOD1*) for overidentification test is insignificant, which means that we cannot reject the null hypothesis that our instruments are valid. Overall, we cannot reject the null hypothesis of no correlation between EID and the instruments.

Table 2.6 2nd Stage: The Effect of Family Involvement and Executive Inside Debt on the Cost of Bank Loan

VARIABLES	(1) *Spread*	(2) *Spread*	(3) *Spread*	(4) *Spread*	(5) *Spread*	(6) *Spread*
CEOD1hat	-0.483***					
	(0.000)					
CEOD2hat		-0.396***				
		(0.001)				
CEOCFOD1hat			-0.467***			
			(0.001)			
CEOCFOD2hat				-0.360***		
				(0.003)		
TMTD1hat					-0.498***	
					(0.000)	
TMTD2hat						-0.405***
						(0.001)
FAM	-0.116***	-0.115***	-0.122***	-0.116***	-0.148***	-0.146***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
FirmSize	0.028*	0.015	0.022	0.010	0.020	0.006
	(0.058)	(0.264)	(0.113)	(0.463)	(0.144)	(0.649)
ROA	-0.451***	-0.441***	-0.409***	-0.392***	-0.444***	-0.430***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Leverage	-0.336	-0.201	-0.368	-0.163	-0.548*	-0.347
	(0.235)	(0.453)	(0.227)	(0.560)	(0.096)	(0.256)
MTB	-0.341***	-0.429***	-0.352***	-0.442***	-0.299***	-0.391***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SDofCF	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LiqCon	0.083**	0.075*	0.085**	0.082**	0.088**	0.084**
	(0.031)	(0.051)	(0.027)	(0.033)	(0.023)	(0.029)
Tenure	0.014**	0.013*	0.004	0.004	-0.029***	-0.025**
	(0.047)	(0.065)	(0.602)	(0.585)	(0.004)	(0.011)
LoanSize	-0.036***	-0.036***	-0.036***	-0.036***	-0.036***	-0.036***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Maturity	0.036*	0.036*	0.036*	0.036*	0.036*	0.036*
	(0.086)	(0.084)	(0.084)	(0.082)	(0.086)	(0.084)
NLender	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Security	0.369***	0.369***	0.369***	0.369***	0.369***	0.369***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CEOIMR1	0.162***	0.164***				
	(0.000)	(0.000)				
CEOCFOIMR1			0.187***	0.188***		
			(0.000)	(0.000)		
TMTIMR1					0.198***	0.199***
					(0.000)	(0.000)
Constant	5.241***	5.362***	5.350***	5.444***	5.550***	5.646***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,180	4,180	4,180	4,180	4,180	4,180
Adj. R^2	0.584	0.583	0.584	0.583	0.584	0.584

Note: This table reports the second stage regressions of cost of bank loan on family involvement and predicted EID for the full sample. *Spread* is the natural log of one plus all-in-drawn spread, where all-in-drawn spread is the interest rate the borrower pays in basis points over LIBOR (London Interbank Offered Rate) for each dollar drawn down. *CEOD1hat* is the predicted *CEOD1*, which is the natural log of one plus CEO relative leverage. *CEOD2hat* is the predicted *CEOD2*, which is the natural log of one plus CEO relative incentive ratio. *CEOCFOD1hat* is the predicted *CEOCFOD1*, which is the natural log of one plus CEO and CFO relative leverage. *CEOCFOD2hat* is the predicted *CEOCFOD2*, which is the natural log of one plus CEO and CFO relative incentive ratio. *TMTD1hat* is the predicted *TMTD1*, which is the natural log of one plus TMT relative leverage. *TMTD2hat* is the predicted *TMTD2*, which is the natural log of one plus TMT relative incentive ratio. *FAM* is equal to 1 if the firm is classified as a family firm, and 0 otherwise. *FirmSize* is the natural log of one plus the firm's total assets. *ROA* is the ratio of income before extraordinary items to total assets. *Leverage* is the ratio of total debt to total assets. *MTB* is the market value of assets divided by total assets. *SDofCF* is the standard deviation of net operating cash flows over the past four years. *LiqCon* is liquidity constraints, an indicator variable set equal to one if the firm generates negative operating cash flow, and zero otherwise. *Tenure* is the natural log of one plus CEO's tenure in months. *LoanSize* is the natural log of one plus the loan's amount. *Maturity* is the natural log of one plus the maturity of the loan in months. *NLender* is the natural log of one plus the number of lenders involving in a loan. *Security* is equal to 1 if the loan has collateral, and 0 otherwise. *CEOIMR1*, *CEOCFOIMR*, and *TMTIMR1* are inverse Mill's ratios calculated from the first stage, controlling for whether a firm has CEO, CEO and CFO, or TMT inside debt or not. Year and industry dummies are included. P-values are reported in parentheses. *, **, and *** represent significance at 10%, 5% and 1% levels, respectively.

As shown in Table 2.6, the coefficients on the inverse Mill's ratio are significant, implying that it is important to control for these self-selection biases.[3] Across all model specifications, the coefficients on EID are significant and negative suggesting that firms with more EID holding could issue loans at a lower cost. Our results corroborate prior findings that executive debt-like compensation helps reduce the agency cost between shareholders and debtholders (Wei and Yermack, 2011).

To provide more insights on the moderating role of family involvement, we split the full sample into family and non-family subsamples. The results in Table 2.7 show that the coefficients on EID are significantly negative in the non-family group, whereas those on EID are insignificant in the family group. In Columns 1 and 2, the economic significance of the coefficients on CEOD1hat indicates that a one percent change in the average CEO's EID yield a 0.63% more decrease in the average cost of bank loan for non-family firms than for family firms. Next, we investigate the moderating role of family involvement on the relationship between EID and the cost of bank loans. Table 2.8 demonstrates that the coefficients of the interaction terms between EID and family involvement are positive and significant across all model specifications. For instance, the economic significance of the coefficients on CEOD1hat and the interaction term (CEOD1hat*FAM) implies that, if the CEO's EID increases by 1%, the cost of bank loan decreases more in non-family firm than in family firms by 0.192%. The findings suggest that family

[3] We calculate two types of the inverse Mill's ratios. *CEOIMR1 (/CEOCFOIMR1/TMTIMR1)* controls for whether a firm has inside debt or not, while *CEOIMR2 (/CEOCFOIMR2/TMTIMR2)* controls for whether a firm report the inside debt data or not. For brevity, only the results base on the first type of inverse Mill ratio are reported in the paper, and the results based on the second type of inverse Mill ratio are similar.

involvement significantly weakens the EID effect on reducing the cost of bank loans, which is consistent with the hypothesis that family involvement aligns their interests with those of debtholders, thus weakening the effect of EID on cost of debt. H1 is supported[4].

[4] In order to alleviate the potential selection bias caused by the 2007 financial crisis, we replicate the main tests based on the post crisis sample (2011-2016). The results from the post crisis sample are consistent with our main results.

Table 2.7 Subsample Analysis: Family Firm vs Non-family Firm

VARIABLES	(1) *Spread* *FAM*=0	(2) *Spread* *FAM* =1	(3) *Spread* *FAM*=0	(4) *Spread* *FAM* =1	(5) *Spread* *FAM*=0	(6) *Spread* *FAM* =1	(7) *Spread* *FAM*=0	(8) *Spread* *FAM* =1	(9) *Spread* *FAM*=0	(10) *Spread* *FAM* =1	(11) *Spread* *FAM*=0	(12) *Spread* *FAM* =1
CEOD1hat	-0.630***	-0.025										
	(0.000)	(0.944)										
CEOD2hat			-0.518***	-0.023								
			(0.000)	(0.943)								
CEOCFOD1hat					-0.602***	-0.059						
					(0.000)	(0.866)						
CEOCFOD2hat							-0.461***	-0.061				
							(0.000)	(0.846)				
TMTD1hat									-0.638***	-0.078		
									(0.000)	(0.814)		
TMTD2hat											-0.516***	-0.076
											(0.000)	(0.804)
FirmSize	0.025	0.016	0.008	0.015	0.016	0.019	-0.000	0.017	0.014	0.017	-0.004	0.015
	(0.150)	(0.641)	(0.608)	(0.609)	(0.333)	(0.548)	(0.991)	(0.539)	(0.380)	(0.580)	(0.799)	(0.605)
ROA	-0.334***	-0.681**	-0.321***	-0.681**	-0.278***	-0.688**	-0.257**	-0.686**	-0.316***	-0.709**	-0.299***	-0.708**
	(0.002)	(0.047)	(0.002)	(0.046)	(0.008)	(0.043)	(0.014)	(0.044)	(0.003)	(0.037)	(0.004)	(0.037)
Leverage	-0.565*	0.416	-0.390	0.417	-0.587*	0.335	-0.314	0.325	-0.814**	0.278	-0.546*	0.277
	(0.064)	(0.571)	(0.168)	(0.557)	(0.073)	(0.670)	(0.283)	(0.658)	(0.026)	(0.735)	(0.097)	(0.723)
MTB	-0.335***	-0.391**	-0.450***	-0.395***	-0.353***	-0.378**	-0.469***	-0.384***	-0.290***	-0.357*	-0.409***	-0.366**
	(0.000)	(0.024)	(0.000)	(0.002)	(0.000)	(0.030)	(0.000)	(0.003)	(0.001)	(0.062)	(0.000)	(0.013)
SDofCF	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LiqCon	0.094**	0.054	0.083*	0.054	0.096**	0.057	0.092**	0.058	0.099**	0.060	0.094**	0.060
	(0.034)	(0.512)	(0.061)	(0.510)	(0.030)	(0.497)	(0.038)	(0.492)	(0.025)	(0.473)	(0.034)	(0.470)
Tenure	0.023***	0.004	0.021***	0.004	0.009	0.001	0.009	0.001	-0.032***	-0.005	-0.027**	-0.005
	(0.005)	(0.802)	(0.008)	(0.799)	(0.219)	(0.954)	(0.214)	(0.945)	(0.004)	(0.830)	(0.012)	(0.829)
LoanSize	-0.035***	-0.038**	-0.035***	-0.038**	-0.034***	-0.038**	-0.035***	-0.038**	-0.034***	-0.038**	-0.034***	-0.038**
	(0.001)	(0.029)	(0.000)	(0.029)	(0.001)	(0.028)	(0.000)	(0.028)	(0.001)	(0.029)	(0.001)	(0.029)
Maturity	0.040*	-0.017	0.040*	-0.017	0.040*	-0.017	0.040*	-0.017	0.040*	-0.016	0.040*	-0.016
	(0.075)	(0.751)	(0.073)	(0.751)	(0.073)	(0.757)	(0.071)	(0.758)	(0.075)	(0.765)	(0.073)	(0.766)
NLender	-0.003**	-0.002	-0.003**	-0.002	-0.003**	-0.002	-0.003**	-0.002	-0.003**	-0.002	-0.003**	-0.002
	(0.018)	(0.365)	(0.018)	(0.365)	(0.018)	(0.371)	(0.018)	(0.372)	(0.018)	(0.388)	(0.018)	(0.389)
Security	0.379***	0.259***	0.379***	0.259***	0.378***	0.259***	0.378***	0.259***	0.378***	0.261***	0.378***	0.261***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CEOIMR1	0.194***	0.101	0.196***	0.101								
	(0.000)	(0.207)	(0.000)	(0.206)								
CEOCFOIMR1					0.222***	0.110	0.224***	0.109				
					(0.000)	(0.201)	(0.000)	(0.201)				
TMTIMR1									0.245***	0.097	0.246***	0.096
									(0.000)	(0.304)	(0.000)	(0.303)
Constant	5.259***	5.476***	5.420***	5.483***	5.405***	5.485***	5.527***	5.502***	5.650***	5.525***	5.774***	5.548***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,280	900	3,280	900	3,280	900	3,280	900	3,280	900	3,280	900
Adj. R^2	0.602	0.563	0.602	0.563	0.602	0.563	0.602	0.563	0.603	0.562	0.602	0.562

Note: This table reports the second stage regressions of cost of bank loan on family involvement and predicted EID for the family and non-family subsamples. *Spread* is the natural log of one plus all-in-drawn spread, where all-in-drawn spread is the interest rate the borrower pays in basis points over LIBOR (London Interbank Offered Rate) for each dollar drawn down. *CEOD1hat* is the predicted *CEOD1*, which is the natural log of one plus CEO relative leverage. *CEOD2hat* is the predicted *CEOD2*, which is the natural log of one plus CEO relative incentive ratio. *CEOCFOD1hat* is the predicted *CEOCFOD1*, which is the natural log of one plus CEO and CFO relative leverage. *CEOCFOD2hat* is the predicted *CEOCFOD2*, which is the natural log of one plus CEO and CFO relative incentive ratio. *TMTD1hat* is the predicted *TMTD1*, which is the natural log of one plus TMT relative leverage. *TMTD2hat* is the predicted *TMTD2*, which is the natural log of one plus TMT relative incentive ratio. *FAM* is equal to 1 if the firm is classified as a family firm, and 0 otherwise. *FirmSize* is the natural log of one plus the firm's total assets. *ROA* is the ratio of income before extraordinary items to total assets. *Leverage* is the ratio of total debt to total assets. *MTB* is the market value of assets divided by total assets. *SDofCF* is the standard deviation of net operating cash flows over the past four years. *LiqCon* is liquidity constraints, an indicator variable set equal to one if the firm generates negative operating cash flow, and zero otherwise. *Tenure* is the natural log of one plus CEO's tenure in months. *LoanSize* is the natural log of one plus the loan's amount. *Maturity* is the natural log of one plus the maturity of the loan in months. *NLender* is the natural log of one plus the number of lenders involving in a loan. *Security* is equal to 1 if the loan has collateral, and 0 otherwise. *CEOIMR1*, *CEOCFOIMR*, and *TMTIMR1* are inverse Mill's ratios calculated from the first stage, controlling for whether a firm has CEO, CEO and CFO, or TMT inside debt or not. Year and industry dummies are included. P-values are reported in parentheses. *, **, and *** represent significance at 10%, 5% and 1% levels, respectively.

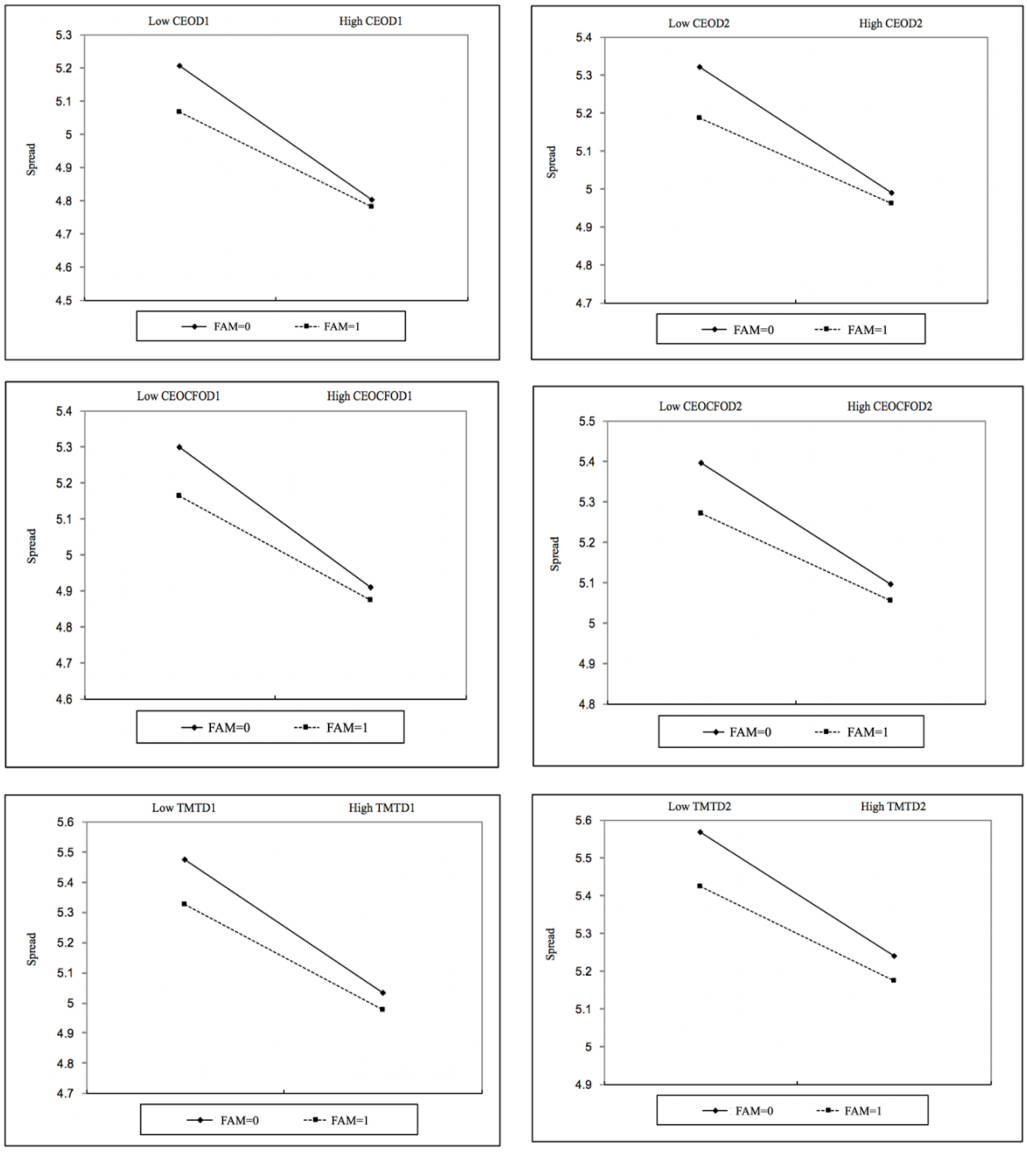
Table 2.8 2nd stage: The Moderating Effect of Family Involvement

VARIABLES	(1) *Spread*	(2) *Spread*	(3) *Spread*	(4) *Spread*	(5) *Spread*	(6) *Spread*
CEOD1hat	-0.510***					
	(0.000)					
*CEOD1hat*FAM*	0.192***					
	(0.001)					
CEOD2hat		-0.421***				
		(0.001)				
*CEOD2hat*FAM*		0.176***				
		(0.002)				
CEOCFOD1hat			-0.482***			
			(0.000)			
*CEOCFOD1hat*FAM*			0.159***			
			(0.003)			
CEOCFOD2hat				-0.375***		
				(0.002)		
*CEOCFOD2hat*FAM*				0.141***		
				(0.008)		
TMTD1hat					-0.502***	
					(0.000)	
*TMTD1hat*FAM*					0.139***	
					(0.006)	
TMTD2hat						-0.411***
						(0.001)
*TMTD2hat*FAM*						0.127**
						(0.012)
FAM	-0.215***	-0.209***	-0.205***	-0.193***	-0.224***	-0.216***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
FirmSize	0.025*	0.013	0.019	0.008	0.017	0.004
	(0.100)	(0.342)	(0.171)	(0.549)	(0.213)	(0.746)
ROA	-0.425***	-0.418***	-0.386***	-0.373***	-0.420***	-0.410***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Leverage	-0.284	-0.153	-0.306	-0.111	-0.466	-0.276
	(0.311)	(0.565)	(0.311)	(0.690)	(0.154)	(0.363)
MTB	-0.356***	-0.440***	-0.368***	-0.452***	-0.320***	-0.405***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SDofCF	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LiqCon	0.087**	0.078**	0.088**	0.084**	0.090**	0.086**
	(0.024)	(0.041)	(0.022)	(0.029)	(0.019)	(0.025)
Tenure	0.016**	0.014**	0.005	0.005	-0.026***	-0.022**
	(0.027)	(0.044)	(0.460)	(0.483)	(0.009)	(0.021)
LoanSize	-0.037***	-0.037***	-0.037***	-0.037***	-0.037***	-0.037***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Maturity	0.034	0.034	0.034*	0.035*	0.034*	0.035*
	(0.105)	(0.101)	(0.098)	(0.094)	(0.100)	(0.095)
NLender	-0.003**	-0.003**	-0.003**	-0.003***	-0.003**	-0.003**
	(0.011)	(0.010)	(0.011)	(0.010)	(0.012)	(0.011)
Security	0.369***	0.370***	0.368***	0.369***	0.369***	0.369***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CEOIMR1	0.160***	0.164***				
	(0.000)	(0.000)				
CEOCFOIMR1			0.186***	0.190***		
			(0.000)	(0.000)		
TMTIMR1					0.200***	0.202***
					(0.000)	(0.000)
Constant	5.297***	5.405***	5.393***	5.476***	5.583***	5.668***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,180	4,180	4,180	4,180	4,180	4,180
Adj. R^2	0.585	0.585	0.585	0.584	0.585	0.584

Note: This table reports the second stage results of the moderating effects of family involvement on the relationship between predicted EID and cost of bank loan. *Spread* is the natural log of one plus all-in-drawn spread, where all-in-drawn spread is the interest rate the borrower pays in basis points over LIBOR (London Interbank Offered Rate) for each dollar drawn down. *CEOD1hat* is the predicted *CEOD1*, which is the natural log of one plus CEO relative leverage. *CEOD2hat* is the predicted *CEOD2*, which is the natural log of one plus CEO relative incentive ratio.

CEOCFOD1hat is the predicted *CEOCFOD1*, which is the natural log of one plus CEO and CFO relative leverage. *CEOCFOD2hat* is the predicted *CEOCFOD2*, which is the natural log of one plus CEO and CFO relative incentive ratio. *TMTD1hat* is the predicted *TMTD1*, which is the natural log of one plus TMT relative leverage. *TMTD2hat* is the predicted *TMTD2*, which is the natural log of one plus TMT relative incentive ratio. *FAM* is equal to 1 if the firm is classified as a family firm, and 0 otherwise. *FirmSize* is the natural log of one plus the firm's total assets. *ROA* is the ratio of income before extraordinary items to total assets. *Leverage* is the ratio of total debt to total assets. *MTB* is the market value of assets divided by total assets. *SDofCF* is the standard deviation of net operating cash flows over the past four years. *LiqCon* is liquidity constraints, an indicator variable set equal to one if the firm generates negative operating cash flow, and zero otherwise. *Tenure* is the natural log of one plus CEO's tenure in months. *LoanSize* is the natural log of one plus the loan's amount. *Maturity* is the natural log of one plus the maturity of the loan in months. *NLender* is the natural log of one plus the number of lenders involving in a loan. *Security* is equal to 1 if the loan has collateral, and 0 otherwise. *CEOIMR1*, *CEOCFOIMR*, and *TMTIMR1* are inverse Mill's ratios calculated from the first stage, controlling for whether a firm has CEO, CEO and CFO, or TMT inside debt or not. Year and industry dummies are included. P-values are reported in parentheses. *, **, and *** represent significance at 10%, 5% and 1% levels, respectively.

Figure 2.1 The Moderating Effect of *FamilyFirm1*



2.4.2 The Moderating Effect of Firm Performance

The results related to H2 and H3 are presented in Table 2.9 and 2.10. Consistent with our second hypothesis (H2), the negative impact of EID on cost of bank loans is more pronounced in the below-aspiration subsample as shown in Table 2.9. The coefficients of *CEOD1hat* in Column 1 and 2 suggest that a one percent increase in the average CEO's EID leads to 0.407% decrease in the above aspiration sample, while 0.586% decrease in the below aspiration sample. The coefficients in Columns 3 to 12 provide consistent evidence for Hypothesis 2.

Table 2.10 presents the moderating effects of family involvement on the association between EID and the cost of debt in the above- and below-aspiration subsamples, respectively. In Column 1, the coefficients on the variable *CEOD1 and* the interaction term (*CEOD1*FAM*) are -0.441 and 0.260, and they are significant at the 1% and 5% level, respectively. Our results demonstrate that, when firm performance is above the industry median, the mitigating effect of CEO's EID on the cost of bank loans is stronger in non-family subsample than in family subsample. Specifically, when firm performance is above the industry median, a one percent increase in the average CEO's EID causes more decrease in non-family firms than family firms by 0.260%. In Column 2, the coefficient on the variable *CEOD1* is -0.597, higher than that in Column 1 (-0.441), demonstrating that the mitigating influence of CEO EID on the cost of bank loans is more significant in the below-aspiration group than that in the above-aspiration group. The insignificant coefficient on *CEOD1*FAM* shows that EID makes no difference in reducing the cost of debt between family and non-family firms when firm performance is below aspiration level, which supports H3 that the moderating effect of family involvement on the association between EID and the cost of debt becomes weaker when firm's performance is below its aspiration level. We find similar results (reported in Columns 3 and 4) when an alternative measure of CEO inside

Table 2.9 Subsample Analysis: Above vs Below the Median of 2-SIC Industry ROA (Main Effect)

VARIABLES	(1) *Spread*	(2) *Spread*	(3) *Spread*	(4) *Spread*	(5) *Spread*	(6) *Spread*	(7) *Spread*	(8) *Spread*	(9) *Spread*	(10) *Spread*	(11) *Spread*	(12) *Spread*
	Above	Below	Above	Below	Above	Below	Above	Below	Above	Below	Above	Below
CEOD1hat	-0.407**	-0.586**										
	(0.018)	(0.013)										
CEOD2hat			-0.316**	-0.496**								
			(0.042)	(0.019)								
CEOCFOD1hat					-0.411**	-0.543**						
					(0.019)	(0.024)						
CEOCFOD2hat							-0.300*	-0.432**				
							(0.053)	(0.039)				
TMTD1hat									-0.481***	-0.529**		
									(0.004)	(0.025)		
TMTD2hat											-0.369**	-0.449**
											(0.016)	(0.033)
FAM	-0.090**	-0.123***	-0.086**	-0.126***	-0.096**	-0.128***	-0.087**	-0.125**	-0.128***	-0.149***	-0.120**	-0.152**
	(0.017)	(0.006)	(0.029)	(0.007)	(0.016)	(0.008)	(0.035)	(0.013)	(0.004)	(0.008)	(0.013)	(0.012)
FirmSize	-0.004	0.063***	-0.016	0.048**	-0.010	0.057***	-0.022	0.043**	-0.013	0.057***	-0.028	0.043**
	(0.857)	(0.005)	(0.422)	(0.017)	(0.605)	(0.006)	(0.243)	(0.028)	(0.511)	(0.005)	(0.146)	(0.030)
ROA	0.577*	-0.399***	0.593*	-0.391***	0.608*	-0.341***	0.630**	-0.323***	0.564*	-0.364***	0.586*	-0.352***
	(0.072)	(0.001)	(0.065)	(0.001)	(0.058)	(0.005)	(0.049)	(0.009)	(0.079)	(0.003)	(0.068)	(0.004)
Leverage	-0.362	-0.370	-0.210	-0.241	-0.426	-0.356	-0.208	-0.149	-0.690*	-0.445	-0.441	-0.279
	(0.316)	(0.454)	(0.542)	(0.605)	(0.274)	(0.503)	(0.564)	(0.757)	(0.098)	(0.442)	(0.260)	(0.600)
MTB	-0.415***	-0.286**	-0.495***	-0.388***	-0.415***	-0.311**	-0.500***	-0.411***	-0.341***	-0.281**	-0.440***	-0.372***
	(0.000)	(0.021)	(0.000)	(0.000)	(0.000)	(0.014)	(0.000)	(0.000)	(0.001)	(0.045)	(0.000)	(0.001)
SDofCF	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LiqCon	-0.143**	0.134***	-0.151**	0.124***	-0.140**	0.135***	-0.143**	0.132***	-0.135*	0.135***	-0.139**	0.132***
	(0.039)	(0.002)	(0.030)	(0.004)	(0.043)	(0.002)	(0.039)	(0.002)	(0.050)	(0.002)	(0.043)	(0.002)
Tenure	0.016*	0.010	0.015	0.009	0.006	-0.002	0.006	-0.002	-0.025*	-0.037**	-0.020	-0.033**
	(0.096)	(0.372)	(0.123)	(0.419)	(0.515)	(0.850)	(0.510)	(0.873)	(0.073)	(0.015)	(0.148)	(0.023)
LoanSize	-0.051***	-0.016	-0.051***	-0.016	-0.051***	-0.015	-0.051***	-0.016	-0.052***	-0.015	-0.052***	-0.015
	(0.000)	(0.210)	(0.000)	(0.204)	(0.000)	(0.212)	(0.000)	(0.204)	(0.000)	(0.225)	(0.000)	(0.217)
Maturity	0.046*	0.013	0.046*	0.013	0.046*	0.013	0.046*	0.013	0.046*	0.012	0.046*	0.013
	(0.075)	(0.714)	(0.074)	(0.704)	(0.073)	(0.710)	(0.072)	(0.701)	(0.074)	(0.729)	(0.072)	(0.716)
NLender	0.000	-0.007***	0.000	-0.007***	0.000	-0.007***	0.000	-0.007***	0.000	-0.007***	0.000	-0.007***
	(0.948)	(0.000)	(0.968)	(0.000)	(0.945)	(0.000)	(0.970)	(0.000)	(0.901)	(0.000)	(0.930)	(0.000)
Security	0.421***	0.275***	0.421***	0.275***	0.420***	0.275***	0.420***	0.276***	0.422***	0.275***	0.422***	0.276***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CEOIMR1	0.181***	0.133**	0.182***	0.135**								
	(0.002)	(0.028)	(0.002)	(0.025)								
CEOCFOIMR1					0.190***	0.170***	0.191***	0.173***				
					(0.002)	(0.008)	(0.002)	(0.007)				
TMTIMR1									0.184***	0.206***	0.184***	0.207***
									(0.006)	(0.003)	(0.006)	(0.003)
Constant	6.037***	4.926***	6.134***	5.079***	6.155***	5.029***	6.228***	5.147***	6.375***	5.197***	6.446***	5.317***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,369	1,811	2,369	1,811	2,369	1,811	2,369	1,811	2,369	1,811	2,369	1,811
Adj. R^2	0.575	0.520	0.575	0.520	0.575	0.520	0.575	0.520	0.575	0.521	0.575	0.520

Note: This table reports the second stage regressions of cost of bank loan on family involvement and predicted EID for the above and below the median of 2-SIC industry ROA subsamples. *Spread* is the natural log of one plus all-in-drawn spread, where all-in-drawn spread is the interest rate the borrower pays in basis points over LIBOR (London Interbank Offered Rate) for each dollar drawn down. *CEOD1hat* is the predicted *CEOD1*, which is the natural log of one plus CEO relative leverage. *CEOD2hat* is the predicted *CEOD2*, which is the natural log of one plus CEO relative incentive ratio. *CEOCFOD1hat* is the predicted *CEOCFOD1*, which is the natural log of one plus CEO and CFO relative leverage. *CEOCFOD2hat* is the predicted *CEOCFOD2*, which is the natural log of one plus CEO and CFO relative incentive ratio. *TMTD1hat* is the predicted *TMTD1*, which is the natural log of one plus TMT relative leverage. *TMTD2hat* is the predicted *TMTD2*, which is the natural log of one plus TMT relative incentive ratio. *FAM* is equal to 1 if the firm is classified as a family firm, and 0 otherwise. *FirmSize* is the natural log of one plus the firm's total assets. *ROA* is the ratio of income before extraordinary items to total assets. *Leverage* is the ratio of total debt to total assets. *MTB* is the market value of assets divided by total assets. *SDofCF* is the standard deviation of net operating cash flows over the past four years. *LiqCon* is liquidity constraints, an indicator variable set equal to one if the firm generates negative operating cash flow, and zero otherwise. *Tenure* is the natural log of one plus CEO's tenure in months. *LoanSize* is the natural log of one plus the loan's amount. *Maturity* is the natural log of one plus the maturity of the loan in months. *NLender* is the natural log of one plus the number of lenders involving in a loan. *Security* is equal to 1 if the loan has collateral, and 0 otherwise. *CEOIMR1*, *CEOCFOIMR*, and *TMTIMR1* are inverse Mill's ratios calculated from the first stage, controlling for whether a firm has

CEO, CEO and CFO, or TMT inside debt or not. Year and industry dummies are included. P-values are reported in parentheses. *, **, and *** represent significance at 10%, 5% and 1% levels, respectively.

Table 2.10 Subsample Analysis: Above vs Below the Median of 2-SIC Industry ROA (Moderating Effect)

VARIABLES	(1) *Spread*	(2) *Spread*	(3) *Spread*	(4) *Spread*	(5) *Spread*	(6) *Spread*	(7) *Spread*	(8) *Spread*	(9) *Spread*	(10) *Spread*	(11) *Spread*	(12) *Spread*
	Above	Below	Above	Below	Above	Below	Above	Below	Above	Below	Above	Below
CEOD1hat	-0.441**	-0.597**										
	(0.010)	(0.012)										
*CEOD1hat*FAM*	0.260***	0.045										
	(0.000)	(0.603)										
CEOD2hat			-0.350**	-0.500**								
			(0.024)	(0.019)								
*CEOD2hat*FAM*			0.256***	0.022								
			(0.000)	(0.792)								
CEOCFOD1hat					-0.430**	-0.546**						
					(0.014)	(0.024)						
*CEOCFOD1hat *FAM*					0.230***	0.017						
					(0.001)	(0.834)						
CEOCFOD2hat							-0.322**	-0.432**				
							(0.038)	(0.040)				
*TMTD2hat*FAM*							0.220***	-0.001				
							(0.002)	(0.989)				
TMTD1hat									-0.479***	-0.531**		
									(0.005)	(0.024)		
*TMTD1hat *FAM*									0.213***	0.012		
									(0.001)	(0.871)		
TMTD2hat											-0.373**	-0.449**
											(0.016)	(0.034)
*TMTD2hat*FAM*											0.208***	0.000
											(0.002)	(0.996)
FAM	-0.247***	-0.141**	-0.241***	-0.135**	-0.238***	-0.135**	-0.224***	-0.125*	-0.262***	-0.154**	-0.250***	-0.152**
	(0.000)	(0.017)	(0.000)	(0.029)	(0.000)	(0.028)	(0.000)	(0.051)	(0.000)	(0.020)	(0.000)	(0.031)
FirmSize	-0.008	0.063***	-0.018	0.048**	-0.015	0.057***	-0.024	0.043**	-0.018	0.057***	-0.030	0.043**
	(0.688)	(0.005)	(0.344)	(0.018)	(0.463)	(0.006)	(0.194)	(0.028)	(0.360)	(0.005)	(0.107)	(0.031)
ROA	0.535*	-0.395***	0.564*	-0.389***	0.572*	-0.339***	0.604*	-0.323***	0.532*	-0.362***	0.564*	-0.352***
	(0.094)	(0.001)	(0.077)	(0.002)	(0.072)	(0.006)	(0.057)	(0.009)	(0.095)	(0.003)	(0.077)	(0.004)
Leverage	-0.289	-0.369	-0.141	-0.238	-0.334	-0.354	-0.128	-0.150	-0.550	-0.443	-0.317	-0.279
	(0.419)	(0.455)	(0.680)	(0.609)	(0.388)	(0.506)	(0.721)	(0.756)	(0.185)	(0.444)	(0.415)	(0.600)
MTB	-0.431***	-0.286**	-0.507***	-0.389***	-0.435***	-0.311**	-0.513***	-0.411***	-0.373***	-0.282**	-0.462***	-0.372***
	(0.000)	(0.021)	(0.000)	(0.000)	(0.000)	(0.013)	(0.000)	(0.000)	(0.000)	(0.044)	(0.000)	(0.001)
SDofCF	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LiqCon	-0.104	0.134***	-0.113*	0.124***	-0.106	0.135***	-0.114*	0.132***	-0.104	0.135***	-0.112*	0.132***
	(0.124)	(0.002)	(0.094)	(0.004)	(0.117)	(0.002)	(0.093)	(0.002)	(0.125)	(0.002)	(0.097)	(0.002)
Tenure	0.017*	0.010	0.015	0.009	0.007	-0.002	0.006	-0.002	-0.021	-0.036**	-0.016	-0.033**
	(0.084)	(0.348)	(0.119)	(0.410)	(0.466)	(0.868)	(0.489)	(0.873)	(0.122)	(0.016)	(0.218)	(0.023)
LoanSize	-0.051***	-0.016	-0.051***	-0.016	-0.052***	-0.015	-0.052***	-0.016	-0.052***	-0.015	-0.052***	-0.015
	(0.000)	(0.208)	(0.000)	(0.203)	(0.000)	(0.211)	(0.000)	(0.204)	(0.000)	(0.225)	(0.000)	(0.218)
Maturity	0.045*	0.012	0.045*	0.013	0.045*	0.012	0.046*	0.013	0.045*	0.012	0.046*	0.013
	(0.080)	(0.734)	(0.077)	(0.714)	(0.076)	(0.718)	(0.073)	(0.700)	(0.077)	(0.735)	(0.075)	(0.717)
NLender	0.000	-0.007***	0.000	-0.007***	0.000	-0.007***	0.000	-0.007***	0.000	-0.007***	0.000	-0.007***
	(0.863)	(0.000)	(0.883)	(0.000)	(0.861)	(0.000)	(0.885)	(0.000)	(0.828)	(0.000)	(0.850)	(0.000)
Security	0.422***	0.275***	0.422***	0.275***	0.421***	0.275***	0.422***	0.276***	0.423***	0.275***	0.423***	0.276***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CEOIMR1	0.183***	0.134**	0.186***	0.136**								
	(0.002)	(0.027)	(0.002)	(0.025)								
CEOCFOIMR1					0.194***	0.170***	0.195***	0.173***				
					(0.002)	(0.008)	(0.001)	(0.007)				
TMTIMR1									0.189***	0.206***	0.189***	0.207***
									(0.004)	(0.003)	(0.004)	(0.003)
Constant	6.046***	4.934***	6.135***	5.082***	6.158***	5.032***	6.226***	5.147***	6.366***	5.199***	6.430***	5.317***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,369	1,811	2,369	1,811	2,369	1,811	2,369	1,811	2,369	1,811	2,369	1,811
Adj. R^2	0.589	0.537	0.589	0.537	0.589	0.537	0.588	0.537	0.589	0.538	0.588	0.537

Note: This table reports the second stage results of the moderating effects of family involvement on the relationship between predicted EID and cost of bank loan for the above and below the median of 2-SIC industry ROA subsamples. *Spread* is the natural log of one plus all-in-drawn spread,

where all-in-drawn spread is the interest rate the borrower pays in basis points over LIBOR (London Interbank Offered Rate) for each dollar drawn down. *CEOD1hat* is the predicted *CEOD1*, which is the natural log of one plus CEO relative leverage. *CEOD2hat* is the predicted *CEOD2*, which is the natural log of one plus CEO relative incentive ratio. *CEOCFOD1hat* is the predicted *CEOCFOD1*, which is the natural log of one plus CEO and CFO relative leverage. *CEOCFOD2hat* is the predicted *CEOCFOD2*, which is the natural log of one plus CEO and CFO relative incentive ratio. *TMTD1hat* is the predicted *TMTD1*, which is the natural log of one plus TMT relative leverage. *TMTD2hat* is the predicted *TMTD2*, which is the natural log of one plus TMT relative incentive ratio. *FAM* is equal to 1 if the firm is classified as a family firm, and 0 otherwise. *FirmSize* is the natural log of one plus the firm's total assets. *ROA* is the ratio of income before extraordinary items to total assets. *Leverage* is the ratio of total debt to total assets. *MTB* is the market value of assets divided by total assets. *SDofCF* is the standard deviation of net operating cash flows over the past four years. *LiqCon* is liquidity constraints, an indicator variable set equal to one if the firm generates negative operating cash flow, and zero otherwise. *Tenure* is the natural log of one plus CEO's tenure in months. *LoanSize* is the natural log of one plus the loan's amount. *Maturity* is the natural log of one plus the maturity of the loan in months. *NLender* is the natural log of one plus the number of lenders involving in a loan. *Security* is equal to 1 if the loan has collateral, and 0 otherwise. *CEOIMR1*, *CEOCFOIMR*, and *TMTIMR1* are inverse Mill's ratios calculated from the first stage, controlling for whether a firm has CEO, CEO and CFO, or TMT inside debt or not. Year and industry dummies are included. P-values are reported in parentheses. *, **, and *** represent significance at 10%, 5% and 1% levels, respectively.

debt (*CEOD2*) is used. Columns 5 to 12 summarize results using CEO and CFO inside debt (*CEOCFOD1*, *CEOCFOD2*) and TMT inside debt (*TMTD1* and *TMTD2*) to measure EID. The results remain consistent.[5]

2.4.3 Additional Analysis

We also investigate the effect of EID on the cost of bank loans and the moderating effect of family involvement during the recent global financial crisis period (2007-2010) and post-financial crisis period (2011-2016), respectively. The rationale is that banks have an incentive to charge higher interest rates on borrowers during crisis periods when capital is scarce. EID, which can effectively reduce the risk-taking appetite of firms, is expected to play a more important role in reducing borrowing costs during the crisis period. The results are presented in Tables 2.11 and 2.12. The comparison between coefficients on *CEOD1* in Columns 1 and 2 of Table 2.11 indicate that CEO EID lowers the cost of bank loans more significantly in the financial crisis subsample than in the post-financial crisis subsample. In addition, we use several alternative measures of EID (as summarized in Columns 3 to 12 in Table 2.11), and the results are quantitatively similar.

Table 2.12 summarizes the moderating effect of family involvement in the two financial-crisis-based subsamples. The coefficients on the interaction term (*CEOD1*FAM)* during the financial crisis are insignificant, which indicates that moderating role of family involvement diminishes during the crisis period when capital supply is constrained. In the post-financial crisis period, however, the significantly positive coefficient on the *interaction term* (*CEOD1*FAM)* suggests that the CEO EID has a stronger influence on the cost of bank loans in non-family firms

[5] We also use historical ROA to determine aspiration level. The results (not tabulate) are consistent with those using industry median ROA as benchmark for aspiration level.

than family firms in the post-crisis period. It is plausible that, in the post-financial crisis period, capital supply gradually reverts to pre-crisis levels, and banks are able to recognize the role played by family involvement in moderating the effect of EID and the cost of bank loans.

Table 2.11 Subsample Analysis: During (2007-2010) vs Post Financial Crisis (2011-2016) (Main Effect)

VARIABLES	(1) *Spread*	(2) *Spread*	(3) *Spread*	(4) *Spread*	(5) *Spread*	(6) *Spread*	(7) *Spread*	(8) *Spread*	(9) *Spread*	(10) *Spread*	(11) *Spread*	(12) *Spread*
	2007-10	2011-16	2007-10	2011-16	2007-10	2011-16	2007-10	2011-16	2007-10	2011-16	2007-10	2011-16
CEOD1hat	-0.753***	-0.309**										
	(0.008)	(0.023)										
CEOD2hat			-0.709***	-0.198								
			(0.004)	(0.112)								
CEOCFOD1hat					-0.770***	-0.281**						
					(0.008)	(0.042)						
CEOCFOD2hat							-0.714***	-0.146				
							(0.004)	(0.238)				
TMTD1hat									-0.666**	-0.389***		
									(0.024)	(0.003)		
TMTD2hat											-0.681***	-0.241**
											(0.008)	(0.048)
FAM	-0.122**	-0.117***	-0.139**	-0.107***	-0.138**	-0.118***	-0.154**	-0.100***	-0.149**	-0.152***	-0.182**	-0.131***
	(0.029)	(0.000)	(0.016)	(0.001)	(0.022)	(0.000)	(0.012)	(0.003)	(0.038)	(0.000)	(0.014)	(0.001)
FirmSize	0.078***	0.021	0.060**	0.011	0.066**	0.018	0.046*	0.009	0.057**	0.020	0.037	0.009
	(0.010)	(0.183)	(0.029)	(0.463)	(0.018)	(0.232)	(0.080)	(0.509)	(0.037)	(0.181)	(0.152)	(0.554)
ROA	-0.299**	-0.543***	-0.295**	-0.528***	-0.243*	-0.514***	-0.214	-0.502***	-0.290**	-0.545***	-0.280**	-0.526***
	(0.033)	(0.002)	(0.034)	(0.002)	(0.073)	(0.003)	(0.112)	(0.004)	(0.034)	(0.002)	(0.038)	(0.002)
Leverage	-0.954	0.063	-0.940*	0.270	-1.096*	0.084	-1.029*	0.367	-1.022	-0.238	-1.099*	0.108
	(0.108)	(0.827)	(0.083)	(0.333)	(0.086)	(0.788)	(0.068)	(0.206)	(0.157)	(0.472)	(0.088)	(0.730)
MTB	-0.379***	-0.336***	-0.489***	-0.409***	-0.373***	-0.354***	-0.484***	-0.429***	-0.364**	-0.276***	-0.433***	-0.378***
	(0.008)	(0.000)	(0.000)	(0.000)	(0.010)	(0.000)	(0.000)	(0.000)	(0.031)	(0.001)	(0.001)	(0.000)
SDofCF	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LiqCon	0.094	0.046	0.083	0.040	0.098	0.047	0.098*	0.042	0.095	0.051	0.097	0.046
	(0.115)	(0.346)	(0.160)	(0.411)	(0.101)	(0.340)	(0.100)	(0.385)	(0.114)	(0.292)	(0.106)	(0.342)
Tenure	0.022	0.008	0.022	0.006	0.007	-0.001	0.009	-0.002	-0.037*	-0.028***	-0.038*	-0.020**
	(0.163)	(0.257)	(0.155)	(0.370)	(0.624)	(0.833)	(0.549)	(0.790)	(0.088)	(0.006)	(0.057)	(0.042)
LoanSize	-0.068***	-0.024***	-0.068***	-0.024***	-0.068***	-0.024***	-0.068***	-0.024***	-0.068***	-0.024***	-0.068***	-0.024***
	(0.001)	(0.004)	(0.001)	(0.004)	(0.001)	(0.004)	(0.001)	(0.004)	(0.001)	(0.004)	(0.001)	(0.004)
Maturity	0.104***	-0.021	0.104***	-0.021	0.104***	-0.021	0.104***	-0.021	0.104***	-0.020	0.104***	-0.020
	(0.006)	(0.351)	(0.006)	(0.348)	(0.006)	(0.355)	(0.006)	(0.350)	(0.006)	(0.359)	(0.006)	(0.358)
NLender	-0.004	-0.003***	-0.004	-0.003***	-0.004	-0.003***	-0.004	-0.003***	-0.004	-0.003***	-0.004	-0.003***
	(0.102)	(0.006)	(0.103)	(0.006)	(0.106)	(0.005)	(0.106)	(0.005)	(0.105)	(0.006)	(0.108)	(0.005)
Security	0.517***	0.299***	0.518***	0.299***	0.517***	0.298***	0.518***	0.298***	0.516***	0.299***	0.517***	0.299***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CEOIMR1	0.201***	0.173***	0.200***	0.176***								
	(0.004)	(0.000)	(0.004)	(0.000)								
CEOCFOIMR1					0.216***	0.201***	0.214***	0.204***				
					(0.003)	(0.000)	(0.003)	(0.000)				
TMTIMR1									0.223***	0.218***	0.218***	0.221***
									(0.004)	(0.000)	(0.005)	(0.000)
Constant	5.385***	5.800***	5.600***	5.864***	5.584***	5.878***	5.804***	5.899***	5.832***	6.056***	6.088***	6.061***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,347	2,833	1,347	2,833	1,347	2,833	1,347	2,833	1,347	2,833	1,347	2,833
Adj. R^2	0.667	0.508	0.667	0.507	0.667	0.508	0.667	0.507	0.666	0.509	0.667	0.508

Note: This table reports the second stage regressions of cost of bank loan on family involvement and predicted EID for during financial crisis (2007-2010) and post financial crisis (2011-2016) subsamples. *Spread* is the natural log of one plus all-in-drawn spread, where all-in-drawn spread is the interest rate the borrower pays in basis points over LIBOR (London Interbank Offered Rate) for each dollar drawn down. *CEOD1hat* is the predicted *CEOD1*, which is the natural log of one plus CEO relative leverage. *CEOD2hat* is the predicted *CEOD2*, which is the natural log of one plus CEO relative incentive ratio. *CEOCFOD1hat* is the predicted *CEOCFOD1*, which is the natural log of one plus CEO and CFO relative leverage. *CEOCFOD2hat* is the predicted *CEOCFOD2*, which is the natural log of one plus CEO and CFO relative incentive ratio. *TMTD1hat* is the predicted *TMTD1*, which is the natural log of one plus TMT relative leverage. *TMTD2hat* is the predicted *TMTD2*, which is the natural log of one plus TMT relative incentive ratio. *FAM* is equal to 1 if the firm is classified as a family firm, and 0 otherwise. *FirmSize* is the natural log of one plus the firm's total assets. *ROA* is the ratio of income before extraordinary items to total assets. *Leverage* is the ratio of total debt to total assets. *MTB* is the market value of assets divided by total assets. *SDofCF* is the standard deviation of net operating cash flows over the past four years. *LiqCon* is liquidity constraints, an indicator variable set equal to one if the firm generates negative operating cash flow, and zero otherwise. *Tenure* is the natural log of one plus CEO's tenure in months. *LoanSize* is the natural log of one plus the loan's amount. *Maturity* is the natural log of one plus the maturity of the loan in months. *NLender* is the natural log of one plus the number of lenders involving in a loan. *Security* is equal to 1 if the loan has collateral, and 0 otherwise. *CEOIMR1*, *CEOCFOIMR*, and *TMTIMR1* are inverse Mill's ratios calculated from the first stage, controlling for whether a firm

has CEO, CEO and CFO, or TMT inside debt or not. Year and industry dummies are included. P-values are reported in parentheses. *, **, and *** represent significance at 10%, 5% and 1% levels, respectively.

Table 2.12 Subsample Analysis: During (2007-2010) vs Post Financial Crisis (2011-2016) (Moderating effect)

VARIABLES	(1) *Spread*	(2) *Spread*	(3) *Spread*	(4) *Spread*	(5) *Spread*	(6) *Spread*	(7) *Spread*	(8) *Spread*	(9) *Spread*	(10) *Spread*	(11) *Spread*	(12) *Spread*
	2007-10	2011-16	2007-10	2011-16	2007-10	2011-16	2007-10	2011-16	2007-10	2011-16	2007-10	2011-16
CEOD1hat	-0.763***	-0.338**										
	(0.008)	(0.013)										
*CEOD1hat*FAM*	0.062	0.202***										
	(0.546)	(0.000)										
CEOD2hat			-0.715***	-0.225*								
			(0.004)	(0.069)								
*CEOD2hat*FAM*			0.042	0.199***								
			(0.678)	(0.000)								
CEOCFOD1hat					-0.774***	-0.298**						
					(0.008)	(0.031)						
*CEOCFOD1hat*FAM*					0.036	0.170***						
					(0.712)	(0.001)						
CEOCFOD2hat							-0.717***	-0.162				
							(0.004)	(0.189)				
*CEOCFOD2hat*FAM*							0.019	0.159***				
							(0.845)	(0.003)				
TMTD1hat									-0.669**	-0.394***		
									(0.024)	(0.003)		
*TMTD1hat*FAM*									0.067	0.128***		
									(0.453)	(0.008)		
TMTD2hat											-0.686***	-0.245**
											(0.008)	(0.044)
*TMTD2hat*FAM*											0.055	0.119**
											(0.531)	(0.016)
FAM	-0.157**	-0.217***	-0.164*	-0.204***	-0.158*	-0.204***	-0.165*	-0.181***	-0.187**	-0.220***	-0.216**	-0.193***
	(0.050)	(0.000)	(0.053)	(0.000)	(0.053)	(0.000)	(0.053)	(0.000)	(0.033)	(0.000)	(0.019)	(0.000)
FirmSize	0.076**	0.017	0.059**	0.008	0.065**	0.015	0.046*	0.007	0.055**	0.017	0.036	0.007
	(0.011)	(0.280)	(0.030)	(0.569)	(0.018)	(0.329)	(0.081)	(0.600)	(0.041)	(0.249)	(0.163)	(0.631)
ROA	-0.290**	-0.528***	-0.288**	-0.516***	-0.237*	-0.502***	-0.211	-0.495***	-0.277**	-0.535***	-0.269**	-0.520***
	(0.039)	(0.003)	(0.038)	(0.003)	(0.081)	(0.004)	(0.119)	(0.005)	(0.044)	(0.002)	(0.048)	(0.003)
Leverage	-0.939	0.114	-0.930*	0.322	-1.082*	0.146	-1.023*	0.424	-0.986	-0.167	-1.071*	0.173
	(0.112)	(0.693)	(0.085)	(0.247)	(0.088)	(0.641)	(0.068)	(0.144)	(0.170)	(0.613)	(0.094)	(0.581)
MTB	-0.384***	-0.350***	-0.492***	-0.418***	-0.377***	-0.369***	-0.486***	-0.438***	-0.374**	-0.293***	-0.439***	-0.389***
	(0.006)	(0.000)	(0.000)	(0.000)	(0.008)	(0.000)	(0.000)	(0.000)	(0.025)	(0.000)	(0.000)	(0.000)
SDofCF	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LiqCon	0.096	0.048	0.085	0.042	0.100*	0.048	0.099*	0.043	0.098	0.053	0.099*	0.047
	(0.108)	(0.319)	(0.153)	(0.387)	(0.098)	(0.321)	(0.099)	(0.375)	(0.106)	(0.276)	(0.100)	(0.332)
Tenure	0.022	0.009	0.023	0.007	0.008	0.000	0.009	-0.001	-0.035	-0.025**	-0.037*	-0.018*
	(0.152)	(0.172)	(0.149)	(0.278)	(0.604)	(0.986)	(0.541)	(0.922)	(0.101)	(0.014)	(0.063)	(0.071)
LoanSize	-0.069***	-0.025***	-0.068***	-0.025***	-0.068***	-0.025***	-0.068***	-0.025***	-0.069***	-0.025***	-0.069***	-0.025***
	(0.001)	(0.003)	(0.001)	(0.003)	(0.001)	(0.003)	(0.001)	(0.003)	(0.001)	(0.003)	(0.001)	(0.003)
Maturity	0.104***	-0.022	0.104***	-0.022	0.104***	-0.022	0.104***	-0.022	0.103***	-0.022	0.103***	-0.021
	(0.006)	(0.316)	(0.006)	(0.318)	(0.006)	(0.324)	(0.006)	(0.325)	(0.006)	(0.334)	(0.006)	(0.337)
NLender	-0.004	-0.003**	-0.004	-0.003**	-0.004	-0.003**	-0.004	-0.003***	-0.004	-0.003**	-0.004	-0.003***
	(0.103)	(0.012)	(0.104)	(0.011)	(0.106)	(0.011)	(0.106)	(0.010)	(0.107)	(0.010)	(0.110)	(0.009)
Security	0.516***	0.300***	0.517***	0.300***	0.516***	0.299***	0.517***	0.299***	0.515***	0.300***	0.517***	0.300***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CEOIMR1	0.200***	0.172***	0.199***	0.177***								
	(0.004)	(0.000)	(0.004)	(0.000)								
CEOCFOIMR1					0.215***	0.201***	0.214***	0.205***				
					(0.003)	(0.000)	(0.003)	(0.000)				
TMTIMR1									0.223***	0.218***	0.218***	0.222***
									(0.004)	(0.000)	(0.005)	(0.000)
Constant	5.416***	5.836***	5.620***	5.886***	5.601***	5.906***	5.812***	5.916***	5.862***	6.072***	6.112***	6.067***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,347	2,833	1,347	2,833	1,347	2,833	1,347	2,833	1,347	2,833	1,347	2,833
Adj. R^2	0.667	0.510	0.667	0.510	0.667	0.510	0.667	0.509	0.666	0.510	0.667	0.509

Note: This table reports the second stage results of the moderating effects of family involvement on the relationship between predicted EID and cost of bank loan for during financial crisis (2007-2010) and post financial crisis (2011-2016) subsamples. *Spread* is the natural log of one plus all-in-drawn spread, where all-in-drawn spread is the

interest rate the borrower pays in basis points over LIBOR (London Interbank Offered Rate) for each dollar drawn down. *CEOD1hat* is the predicted *CEOD1*, which is the natural log of one plus CEO relative leverage. *CEOD2hat* is the predicted *CEOD2*, which is the natural log of one plus CEO relative incentive ratio. *CEOCFOD1hat* is the predicted *CEOCFOD1*, which is the natural log of one plus CEO and CFO relative leverage. *CEOCFOD2hat* is the predicted *CEOCFOD2*, which is the natural log of one plus CEO and CFO relative incentive ratio. *TMTD1hat* is the predicted *TMTD1*, which is the natural log of one plus TMT relative leverage. *TMTD2hat* is the predicted *TMTD2*, which is the natural log of one plus TMT relative incentive ratio. *FAM* is equal to 1 if the firm is classified as a family firm, and 0 otherwise. *FirmSize* is the natural log of one plus the firm's total assets. *ROA* is the ratio of income before extraordinary items to total assets. *Leverage* is the ratio of total debt to total assets. *MTB* is the market value of assets divided by total assets. *SDofCF* is the standard deviation of net operating cash flows over the past four years. *LiqCon* is liquidity constraints, an indicator variable set equal to one if the firm generates negative operating cash flow, and zero otherwise. *Tenure* is the natural log of one plus CEO's tenure in months. *LoanSize* is the natural log of one plus the loan's amount. *Maturity* is the natural log of one plus the maturity of the loan in months. *NLender* is the natural log of one plus the number of lenders involving in a loan. *Security* is equal to 1 if the loan has collateral, and 0 otherwise. *CEOIMR1*, *CEOCFOIMR*, and *TMTIMR1* are inverse Mill's ratios calculated from the first stage, controlling for whether a firm has CEO, CEO and CFO, or TMT inside debt or not. Year and industry dummies are included. P-values are reported in parentheses. *, **, and *** represent significance at 10%, 5% and 1% levels, respectively.

2.4.4 Robustness Tests

To mitigate the potential endogeneity issue, we use a propensity-score matching (PSM) method developed by Rosenbaum and Rubin (1983). We match the family firms by identifying the non-family firms with the smallest propensity-score differences, such that matched pairs have similar firm characteristics. Then, we investigate the hypothesis based on our matched samples. Table 2.13 reports our main tests based on the PSM sample by using *CEOD1*. The results are consistent with our main tests. We also use *CEOD2*, *CEOCFOD1*, *CEOCFOD2*, *TMTD1*, *TMTD2* based on PSM sample, and get similar results.

To rule out the possible non-linearities between executive inside debt and cost of bank loan. We use an alternative measure of executive inside debt. *CEOD1_C* is equal to 1, 2 or 3 if CEO inside debt holding falls in the smallest 33%, 34% to 67%, or in the top 33%. The results in Table 2.14 are consistent with our main tests, demonstrating that the association between EID and cost of bank loan are linear.

Table 2.13 Robustness Tests Based on PSM Sample

VARIABLES	(1) *CEOD1*	(2) *Spread*	(3) *Spread*	(4) *Spread*	(5) *Spread*	(6) *Spread*	(7) *Spread*	(8) *Spread*	(9) *Spread*	(10) *Spread*	(11) *Spread*	(12) *Spread*	(13) *Spread*
			FAM=0	*FAM* =1		Above	Below	Above	Below	2007-10	2011-16	2007-10	2011-16
CEOD1hat		-0.319**	-0.825***	-0.014	-0.441***	-0.177	-0.620**	-0.350*	-0.697**	-0.724**	-0.315*	-0.745**	-0.430**
		(0.042)	(0.000)	(0.956)	(0.006)	(0.350)	(0.045)	(0.070)	(0.030)	(0.020)	(0.057)	(0.018)	(0.010)
FAM	-0.113***	-0.092***			-0.214***	-0.046	-0.074*	-0.250***	-0.134**	-0.140**	-0.091***	-0.164**	-0.208***
	(0.006)	(0.001)			(0.000)	(0.242)	(0.072)	(0.000)	(0.034)	(0.011)	(0.003)	(0.038)	(0.000)
*CEOD1hat*FAM*					0.221***			0.314***	0.142			0.042	0.217***
					(0.000)			(0.000)	(0.161)			(0.709)	(0.001)
FirmSize	0.002	0.012	0.006	0.014	0.015	0.018	0.004	0.029	0.003	0.086**	-0.040*	0.086**	-0.039*
	(0.925)	(0.571)	(0.886)	(0.596)	(0.462)	(0.545)	(0.908)	(0.331)	(0.920)	(0.026)	(0.073)	(0.025)	(0.077)
ROA	0.638**	-0.411**	0.147	-0.669*	-0.361*	-0.291	-0.237	-0.227	-0.212	0.048	-0.739**	0.060	-0.801**
	(0.018)	(0.043)	(0.582)	(0.075)	(0.092)	(0.550)	(0.444)	(0.639)	(0.507)	(0.869)	(0.035)	(0.838)	(0.028)
Leverage	-1.706***	0.118	-0.486	0.443	0.099	-0.004	-0.048	-0.050	-0.037	-0.464	0.053	-0.470	0.067
	(0.000)	(0.673)	(0.230)	(0.338)	(0.721)	(0.990)	(0.929)	(0.878)	(0.945)	(0.402)	(0.859)	(0.397)	(0.823)
MTB	0.313***	-0.420***	-0.446***	-0.397***	-0.429***	-0.430***	-0.346***	-0.427***	-0.360***	-0.501***	-0.270***	-0.504***	-0.267***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.009)	(0.000)	(0.006)	(0.000)	(0.002)	(0.000)	(0.002)
SDofCF	0.000***	-0.000***	-0.000	-0.000***	-0.000***	-0.000***	-0.000	-0.000***	-0.000	-0.000***	-0.000**	-0.000***	-0.000**
	(0.006)	(0.000)	(0.183)	(0.000)	(0.000)	(0.000)	(0.136)	(0.000)	(0.155)	(0.000)	(0.031)	(0.000)	(0.029)
LiqCon	-0.123	0.039	-0.015	0.051	0.053	-0.205**	0.069	-0.132	0.065	0.038	0.016	0.042	0.031
	(0.101)	(0.532)	(0.876)	(0.549)	(0.390)	(0.037)	(0.427)	(0.178)	(0.456)	(0.699)	(0.834)	(0.676)	(0.669)
Tenure	-0.039**	-0.009	-0.025	0.003	-0.004	0.006	-0.043**	0.009	-0.040**	-0.017	-0.021	-0.016	-0.016
	(0.018)	(0.454)	(0.154)	(0.867)	(0.749)	(0.738)	(0.020)	(0.584)	(0.029)	(0.485)	(0.106)	(0.519)	(0.209)
LoanSize		-0.050***	-0.052*	-0.038**	-0.053***	-0.089***	-0.004	-0.090***	-0.005	-0.087***	-0.033**	-0.087***	-0.035**
		(0.001)	(0.064)	(0.029)	(0.000)	(0.000)	(0.853)	(0.000)	(0.820)	(0.007)	(0.028)	(0.006)	(0.020)
Maturity		0.011	0.016	-0.017	0.009	0.101**	-0.132*	0.100**	-0.137*	0.047	-0.016	0.045	-0.012
		(0.761)	(0.768)	(0.750)	(0.804)	(0.018)	(0.070)	(0.018)	(0.061)	(0.420)	(0.689)	(0.437)	(0.757)
NLender		-0.001	0.000	-0.002	-0.000	0.003	-0.006**	0.003	-0.005**	-0.003	0.001	-0.003	0.002
		(0.625)	(0.884)	(0.364)	(0.784)	(0.236)	(0.019)	(0.229)	(0.027)	(0.363)	(0.561)	(0.362)	(0.369)
Security		0.278***	0.264***	0.259***	0.274***	0.341***	0.189***	0.331***	0.189***	0.367***	0.199***	0.366***	0.194***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TWage	0.081***												
	(0.003)												
TMorgage	-0.026***												
	(0.002)												
TGain	-0.054**												
	(0.036)												
CEOIMR1		0.082	0.116	0.101	0.094	0.133*	0.031	0.151**	0.042	0.180*	0.067	0.180*	0.084
		(0.169)	(0.224)	(0.207)	(0.111)	(0.062)	(0.770)	(0.031)	(0.697)	(0.068)	(0.332)	(0.067)	(0.222)
Constant	0.576**	5.697***	5.867***	5.488***	5.783***	5.941***	6.045***	5.972***	6.101***	6.251***	6.025***	6.284***	5.978***
	(0.029)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,800	1,800	900	900	1,800	1,072	728	1,072	728	706	1,094	706	1,094
Adj. R^2	0.232	0.56	0.613	0.563	0.564	0.621	0.439	0.627	0.44	0.654	0.51	0.653	0.516

Note: This table reports the robustness test based on PSM ample. *Spread* is the natural log of one plus all-in-drawn spread, where all-in-drawn spread is the interest rate the borrower pays in basis points over LIBOR (London Interbank Offered Rate) for each dollar drawn down. *CEOD1hat* is the predicted *CEOD1*, which is the natural log of one plus CEO relative leverage. *FAM* is equal to 1 if the firm is classified as a family firm, and 0 otherwise. *FirmSize* is the natural log of one plus the firm's total assets. *ROA* is the ratio of income before extraordinary items to total assets. *Leverage* is the ratio of total debt to total assets. *MTB* is the market value of assets divided by total assets. *SDofCF* is the standard deviation of net operating cash flows over the past four years. *LiqCon* is liquidity constraints, an indicator variable set equal to one if the firm generates negative operating cash flow, and zero otherwise. *Tenure* is the natural log of one plus CEO's tenure in months. *LoanSize* is the natural log of one plus the loan's amount. *Maturity* is the natural log of one plus the maturity of the loan in months. *NLender* is the natural log of one plus the number of lenders involving in a loan. *Security* is equal to 1 if the loan has collateral, and 0 otherwise. *CEOIMR1* is the inverse Mill's ratios calculated from the first stage, controlling for whether a firm has CEO inside debt or not. *TWage*, *TMortgage* and *TGain* are maximum state tax rates for wages, mortgage subsidy, and long-term capital gains. Year and industry dummies are included. P-values are reported in parentheses. *, **, and *** represent significance at 10%, 5% and 1% levels, respectively.

Table 2.14 Robustness Tests Based on Alternative Measures for Executive Inside Debt.

VARIABLES	(1) *CEOD1_C*	(2) *Spread*	(3) *Spread*	(4) *Spread*	(5) *Spread*	(6) *Spread*	(7) *Spread*	(8) *Spread*	(9) *Spread*	(10) *Spread*	(11) *Spread*	(12) *Spread*	(13) *Spread*
			FAM=0	*FAM* =1		Above	Below	Above	Below	2007-10	2011-16	2007-10	2011-16
CEOD1_C_hat		-0.269***	-0.343***	-0.045	-0.311***	-0.244**	-0.311**	-0.297***	-0.332**	-0.410**	-0.182**	-0.431**	-0.224***
		(0.000)	(0.000)	(0.812)	(0.000)	(0.010)	(0.018)	(0.002)	(0.014)	(0.011)	(0.015)	(0.010)	(0.002)
FAM	-0.254***	-0.106***			-0.498***	-0.086**	-0.109***	-0.628***	-0.247	-0.105**	-0.113***	-0.288	-0.510***
	(0.000)	(0.000)			(0.000)	(0.013)	(0.008)	(0.000)	(0.101)	(0.044)	(0.000)	(0.144)	(0.000)
*CEOD1_C_hat*FAM*					0.211***			0.280***	0.080			0.098	0.214***
					(0.000)			(0.000)	(0.319)			(0.323)	(0.000)
FirmSize	0.088***	0.025*	0.020	0.019	0.022	-0.005	0.057***	-0.008	0.057***	0.071**	0.019	0.070**	0.016
	(0.000)	(0.090)	(0.252)	(0.559)	(0.127)	(0.795)	(0.008)	(0.703)	(0.008)	(0.015)	(0.203)	(0.016)	(0.287)
ROA	0.167	-0.365***	-0.224**	-0.676**	-0.334***	0.651**	-0.295**	0.594*	-0.285**	-0.166	-0.487***	-0.150	-0.469***
	(0.361)	(0.000)	(0.034)	(0.049)	(0.001)	(0.042)	(0.019)	(0.062)	(0.024)	(0.225)	(0.005)	(0.277)	(0.007)
Leverage	-1.514***	0.247*	0.208	0.399	0.272**	0.103	0.362	0.140	0.361	-0.028	0.422***	-0.019	0.447***
	(0.000)	(0.059)	(0.150)	(0.223)	(0.035)	(0.534)	(0.106)	(0.389)	(0.107)	(0.918)	(0.002)	(0.943)	(0.001)
MTB	0.274***	-0.468***	-0.503***	-0.389***	-0.480***	-0.517***	-0.445***	-0.524***	-0.447***	-0.581***	-0.415***	-0.586***	-0.425***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SDofCF	0.000	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.179)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LiqCon	-0.077	0.043	0.042	0.051	0.048	-0.177**	0.086*	-0.137**	0.086*	0.033	0.020	0.037	0.021
	(0.192)	(0.268)	(0.357)	(0.529)	(0.224)	(0.011)	(0.053)	(0.042)	(0.055)	(0.590)	(0.693)	(0.538)	(0.669)
Tenure	0.057***	0.021***	0.032***	0.006	0.023***	0.023**	0.017	0.023**	0.019	0.032*	0.013*	0.033*	0.015*
	(0.000)	(0.007)	(0.000)	(0.738)	(0.004)	(0.027)	(0.167)	(0.023)	(0.143)	(0.067)	(0.087)	(0.061)	(0.051)
LoanSize		-0.036***	-0.035***	-0.038**	-0.037***	-0.052***	-0.016	-0.052***	-0.016	-0.068***	-0.024***	-0.069***	-0.025***
		(0.000)	(0.000)	(0.029)	(0.000)	(0.000)	(0.207)	(0.000)	(0.203)	(0.001)	(0.004)	(0.001)	(0.003)
Maturity		0.036*	0.040*	-0.017	0.033	0.046*	0.012	0.044*	0.011	0.104***	-0.021	0.102***	-0.023
		(0.086)	(0.074)	(0.755)	(0.114)	(0.075)	(0.720)	(0.088)	(0.760)	(0.006)	(0.350)	(0.007)	(0.313)
NLender		-0.003***	-0.003**	-0.002	-0.003***	0.000	-0.007***	0.000	-0.007***	-0.004*	-0.003***	-0.004	-0.003***
		(0.007)	(0.017)	(0.368)	(0.009)	(0.936)	(0.000)	(0.881)	(0.000)	(0.100)	(0.006)	(0.103)	(0.008)
Security		0.370***	0.380***	0.259***	0.369***	0.421***	0.276***	0.421***	0.276***	0.517***	0.300***	0.516***	0.300***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TWage	0.112***												
	(0.000)												
TMorgage	-0.032***												
	(0.000)												
TGain	-0.073***												
	(0.000)												
CEOIMR1		0.162***	0.193***	0.100	0.160***	0.180***	0.134**	0.186***	0.133**	0.200***	0.173***	0.199***	0.171***
		(0.000)	(0.000)	(0.213)	(0.000)	(0.002)	(0.028)	(0.002)	(0.028)	(0.004)	(0.000)	(0.005)	(0.000)
Constant	0.678***	5.462***	5.540***	5.501***	5.584***	6.237***	5.182***	6.329***	5.226***	5.727***	5.978***	5.800***	6.079***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,180	4,180	3,280	900	4,180	2,369	1,811	2,369	1,811	1,347	2,833	1,347	2,833
Adj. R^2	0.201	0.583	0.602	0.563	0.585	0.575	0.520	0.578	0.520	0.667	0.508	0.667	0.510

Note: This table reports the robustness tests by using alternative measures for executive inside debt. *Spread* is the natural log of one plus all-in-drawn spread, where all-in-drawn spread is the interest rate the borrower pays in basis points over LIBOR (London Interbank Offered Rate) for each dollar drawn down. *CEOD1_C_hat* is the predicted *CEOD1_C*, which is equal to 1, 2 or 3 if CEO inside debt holding is in the smallest 33%, 34% to 67%, or in the top 33%. *FAM* is equal to 1 if the firm is classified as a family firm, and 0 otherwise. *FirmSize* is the natural log of one plus the firm's total assets. *ROA* is the ratio of income before extraordinary items to total assets. *Leverage* is the ratio of total debt to total assets. *MTB* is the market value of assets divided by total assets. *SDofCF* is the standard deviation of net operating cash flows over the past four years. *LiqCon* is liquidity constraints, an indicator variable set equal to one if the firm generates negative operating cash flow, and zero otherwise. *Tenure* is the natural log of one plus CEO's tenure in months. *LoanSize* is the natural log of one plus the loan's amount. *Maturity* is the natural log of one plus the maturity of the loan in months. *NLender* is the natural log of one plus the number of lenders involving in a loan. *Security* is equal to 1 if the loan has collateral, and 0 otherwise. *CEOIMR1* is the inverse Mill's ratios calculated from the first stage, controlling for whether a firm has CEO inside debt or not. *TWage*, *TMortgage* and *TGain* are maximum state tax rates for wages, mortgage subsidy, and long-term capital gains. Year and industry dummies are included. P-values are reported in parentheses. *, **, and *** represent significance at 10%, 5% and 1% levels, respectively.

2.5 Conclusions

This study adds to the literature by documenting the heterogeneity between family firms and their non-family peers regarding to the impact of EID on cost of debt. Family firms are more risk-averse than non-family firms largely due to their incentives to protect family image and reputation. Behavioral agency theory predicts that family firms face a lower level of shareholder-creditor agency conflicts than non-family firms. Anantharaman et al. (2014) document a mitigating effect of CEO's EID on the cost of debt, and therefore it is of interest to explore the context in which CEO debt-like compensation may have a distinctive influence on the cost of debt. Our results support the notion that family involvement weakens the effect of EID on reducing the cost of bank loans. This study also extends the literature on family business by showing that family firms are not homogenous (Carpenter, 2002; Huybrechts *et al*., 2013). Family firms may exhibit different risk-taking behaviors, conditional on whether firm performance is above or below their aspiration levels. This motivates us to further investigate whether the moderating effects of family involvement on the association between EID and the cost of bank loans are influenced by the firm's relative performance. Furthermore, we explore whether the above-discussed relationships differ between two subsamples: one focusing on the period during the financial crisis and the other focusing on the post-financial crisis period.

Our sample comprises of 4,180 bank loans issued by 817 U.S. public companies during the period 2007-2016. In line with our prediction, our empirical results support that the influence of EID on lowering the cost of bank loans is attenuated in family firms. The finding is consistent with the view that family involvement and EID substitute with each other in lowering the cost of debt. Our results also indicate that the mitigating effect of EID on the cost of bank loans is stronger

when firm performance is below its aspiration levels, and the moderating effect of family involvement on the association between EID and the cost of debt becomes weaker when firm's performance is below its aspiration level. We also demonstrate that the mitigating influence of EID on the cost of bank loans is stronger in the financial crisis period (2007-2010). Our main findings are insensitive to adopting alternative EID measures (including alternative CEO inside debt measures, CEO plus CFO inside debt measures, and total TMT inside debt measures) and controlling for self-selection bias.

Our study has important practical implication. First, non-family firms may offer executives more debt-like compensation in order to mitigate the shareholders-debtholders conflict of interest. From the perspective of debtholders and credit rating agencies, it is important to consider both the impact of family involvement and the firm's relative performance when designing debt contract terms and providing credit ratings. In addition, based on an in-depth understanding of the benefits of granting EID on the cost of debt financing, policymakers (i.e., SEC) may tighten the regulations on disclosure of inside debt to promote the welfare of listed firms (in terms of reducing the cost of external borrowing) and investors (in terms of achieving a better assessment of risk-taking behavior of their investees).

We provide the following suggestion for future research. First, prior researchers find that debt contracts for family firms are more lenient because greater risk aversion and a long-term orientation align the interests between family firms and lenders (Hillier et al., 2018), and EID reduces the number of debt covenants (Anantharaman et al., 2014). Future studies could examine whether family ownership moderates the relation between EID and number of debt covenants as well as the strictness of terms and conditions in the debt contract. Second, in this study we use a

binary variable to reflect family involvement: it equals one if family members have at least 5% of the ownership, and zero otherwise. However, this approach limits our ability to perform granular analysis of the role of family involvement in influencing the relationship between EID and cost of debt. For instance, the impact of EID on cost of debt could be quite different between a firm with 10% family ownership and another firm with 95% family ownership. We call for future research to take the advantage of the continuous measurement of family ownership to shed more light on this important issue, which such data are available.

CHAPTER 3: ESSAY 2

International Joint Ventures by Family Firms: A Narrow-Framing Perspective

Abstract

This study investigates whether family involvement in business affects firms' engagement in international joint ventures (IJVs). Based on the narrow framing perspective, we argue that family firms utilize risk diversifying strategies across multiple IJV decisions, more so than nonfamily firms, because the family firms' decisions tend to be broadly-framed. Examining the interaction between three IJV decisions (type of IJV, choice of host country, and number of partners) in a sample of 1,439 IJVs formed by public firms in the US, we found support for our predictions.

Keywords: family firms, international joint ventures, narrow framing

3.1 Introduction

Over the years, scholars have devoted considerable attention to the motives behind firms' decisions to engage in international joint ventures (IJVs). This vast body of literature lists access to new capabilities and technologies, gains from economies of scale, international experience, increases in market power, efficient resource deployment, and shared costs and risks as key strategic drivers for forming IJVs (Beamish and Lupton 2016; Y. Luo and Park 2004; Buckley and Casson 1998; Kogut 1991). Despite the large number of studies on this topic, the motives of business owners for forming IJVs remain largely unknown and are likely to vary depending on a firm's ownership configuration as the values and goals of owners vary, even among publicly listed firms (Desender et al. 2013; Thomsen and Pedersen 2000).

Family firms have been identified as the most ubiquitous type of business worldwide, forming the majority of firms in both developing and developed countries (La Porta, Lopez-De-Silanes, and Shleifer 1999; De Massis et al. 2018; X. Luo, Chung, and Sobczak 2009). Due to family firms' distinctive characteristics, we hypothesize that they would differ from nonfamily firms in IJV engagement. The pursuit of non-economic goals is the most noticeable of these characteristics owing to families' strong emotional attachment, commitment to, and identification with the firm (Gómez-Mejía et al. 2007). In addition, the risk preferences of family firms resulting from concentrated family wealth differ from the risk preferences of nonfamily firms (Gomez-Mejia, Makri, and Kintana 2010; Chrisman and Patel 2012; Zahra 2005). Unfortunately, prior work on the role played by family ownership in the context of IJVs has mainly been limited to the understanding how much more likely family firms are than nonfamily firms to engage in IJVs (e.g., Abdellatif, Amann, & Jaussaud, 2010). As a result, we know very little about whether and how family involvement in business affects the way firms engage in IJVs.

When firms engage in IJVs, they tend to follow a sequential, multi-stage decision process

from the choice of country to the selection of partners and governance modes (Xu, Hitt, and Miller 2020; Brouthers and Bamossy 1997; Roy and Oliver 2009). These decisions are important determinants of IJV performance because each is associated with potential risks and rewards. Nonetheless, how family firms manage risks stemming from the multiple dimensions of IJVs and to what extent their IJV strategies differ from those of nonfamily firms remain largely unexplored (Nippa and Reuer 2019).

In this study, we seek to address this gap by studying IJVs formed by family firms and nonfamily firms along three important dimensions of IJV formation: 1) the type of IJV formed; 2) the choice of host country; and 3) the number of IJV partners. Prior research has often looked at each of these dimensions individually without considering potential interactive effects. Thus, the possibility that firms may make these decisions as a group rather than in isolation; and that organizations such as family firms might be particularly apt to do so has not been considered. In this research, we follow existing literature on family business to first hypothesize that compared to their nonfamily counterparts, family firms are more inclined to 1) pursue related rather than unrelated IJVs; 2) form IJVs in countries with high institutional protections; and 3) prefer multi-party IJVs to dyadic ones - because doing so allows family firms to preserve the SEW endowments. We then draw upon the narrow-framing perspective to further propose that family businesses are more prone to diversify risks across multiple IJV-related decisions such that the level of risk taken in one decision is negatively associated with the risk level of subsequent decisions. By employing a sample of 1,439 IJVs formed by US firms on the Standard & Poor 1500 list between 1997 and 2014, we find support for our hypotheses.

Our study makes important contributions to several areas of the literature. Previous studies have predominantly focused on the relative propensity of family and nonfamily firms to engage in IJVs, with the results indicating that compared with their nonfamily peers, family firms engage in

less IJVs (e.g., Abdellatif et al., 2010). This study extends this line of inquiry by investigating three important post-formation decisions. By looking at the firm's choice of IJV type, host country, and partners, we provide a more nuanced understanding of the role that family ownership plays in international joint venture decisions. Our findings underscore that viewing IJV decisions in a separate or isolated manner may lead to erroneous conclusions about firms' risk-taking behaviors and fail to capture unique family firms' approaches to managing the multiple risks associated with IJVs.

Our study responds to a recent call by international business scholars to examine whether, how, and why family firms differ from nonfamily firms in their approach to IJV decisions (Nippa and Reuer 2019). In addition, we build on and extend the utility of the narrow-framing (choice-bracketing) perspective in predicting the risk taking tendencies of family firms (Kahneman and Lovallo 1993; Read and Loewenstein 1995). For example, by examining the interactions between R&D investment and internationalization intensity, Fang, Memili, Chrisman, and Tang (2021) found that family firms tend to manage investments over multiple strategic decisions (i.e., R&D and internationalization) in a way that keeps risks within levels that are neither too high or too low. As such, family firms are likely to broadly frame risky decisions in comparison to nonfamily firms which seem more likely to succumb to narrowly-framed decision making. We extend the utility of the narrow framing perspective by using it to illuminate how firms approach an initiative composed of multiple risky decisions that are, by necessity, interrelated, such as is the case in IJVs, rather than how they approach multiple risky decisions such as R&D and internationalization that are not necessarily related. We illustrate that a firm's tendency to frame decisions narrowly or broadly does not necessarily end with the decision to engage in risky activities, but may persist to influence the manner in which they engage in these activities.

The remainder of this paper is organized as follows. The next section presents the theoretical

framework and hypotheses. The sample and methods used in the study are then outlined, followed by the empirical results. The last section presents the theoretical and practical implications of the research, as well as future research directions.

3.2 Theoretical Background

The notion that family members attach socioemotional value to the firm and that the primary goal of family firms is the preservation of their SEW constitute the theoretical foundation of most current research on family firms (Gómez-Mejía et al. 2007). SEW is conceptualized in broad terms as capturing the range of non-economic aspects of a business that fulfill the family's affective and social needs, including the ability to exercise family control and influence, ensure family values in the firm, act altruistically toward family members, and build a family dynasty (Berrone, Cruz, and Gomez-Mejia 2012; Miller and Le Breton–Miller 2014; Gómez-Mejía et al. 2007). Aiming to preserve their SEW, family firms are often understood to be risk averse. For instance, they usually invest less in diversification (Gomez-Mejia, Makri, and Kintana 2010), R&D projects (Chrisman and Patel 2012), internationalization (Alessandri, Cerrato, and Eddleston 2018), and firm acquisition (Gomez-Mejia, Patel, and Zellweger 2018) as these activities might disrupt the historical foundations of the company (De Massis et al. 2016) and dilute family control (Gomez-Mejia, Makri, and Kintana 2010). However, it has also been noted that the risk preference of family firms is subject to reversals. When facing performance hazards, family firms may take more risks than their nonfamily peers in order to salvage an unsatisfactory situation and prevent excessive losses to their economic and socioemotional endowments (Kotlar et al. 2014; Chrisman and Patel 2012).

While existing studies provide important insights into family firms' decision-making, they tend to depict family firms as either risk-averse or risk-seeking by focusing on one particular risky

decision, ignoring the fact that 1) any strategic move might include multiple risky decisions; and 2) some organizations such as family firms may combine high and low-risk activities into their overall business strategy. In practice, firms must make various decisions at once or over time. As a result, conceptualizing risk preference along one dimension may not sufficiently capture the complexities of risk-taking behaviors of family firms or firms in general. Until recently, research on family business have thus incorporated the concept of narrow framing from prospect theory to incorporate considerations for multiple strategic decisions. Rooted in behavioral economics, narrow framing examines an individual's tendency to examine multiple risky choices alone rather than together (Kahneman and Lovallo 1993). People have an innate tendency to break down complex problems into manageable parts, which leads to narrow framing (Benartzi and Thaler 1995; Thaler 1985). Thus, when confronted with multiple decisions or evaluating multiple risks, people tend to view each choice or risk as unique and overlook possible connections between them (Kahneman and Lovallo 1993). The shared wisdom is that narrowly framed decisions are far less risk-neutral than those made in a more inclusive manner (Kahneman 2003). In fact, narrow framing inhibits utilizing diversification strategies across multiple risky prospects, which requires joint analysis.

Building on the narrow-framing perspective, scholars have recently proposed that family firms possess several distinct characteristics that make them less prone to the problem of narrow framing (Fang et al. 2021). As will be further elaborated, unified ownership and control and long-term goal orientation allow family firms' decision-makers to have greater discretion and take a broader view in decision making. As such, when evaluating multiple decisions simultaneously, family decision-makers tend to be more cognizant of the connections between multiple risky decisions. The utility of the narrow framing perspective in predicting family firm risk-taking has been demonstrated by Fang et al. (2021), who found that family firms are more likely than

nonfamily firms to combine high and low-risk activities across different strategic decisions. It means that in family firms, the level of risk in one decision (i.e., internationalization) was found to be more negatively associated with the level of risk taken in a subsequent decision (i.e., R&D investment). The narrow framing perspective thus enriches the prevailing "conservative view" of family firms (when firm performance fall short of expectations, family firms are only thought to participate in risky activities) by suggesting that family firms may in fact take risks if they can offset that risk through other strategic decisions.

We posit that this logic also has utility when applied to the multiple decisions which confront a firm engaged in international joint ventures, such as (1) the type of IJVs to pursue (i.e. relatedness); (2) the choice of host country to enter; and (3) the number of partners. The types of IJV selected reflect a firm's strategic objectives (Cui and Kumar 2012), and the performance of IJVs depends heavily upon the choice of host country and partners (Y. Luo 2007). Each of these decisions also carry risks and yet are adequately distinctive for decision makers to separate them from one another. In the following section, we first look at these three decisions individually and explain how they are likely to be influenced by family-centered non-economic goals (i.e. SEW preservation) in family firms. We then draw upon the narrow-framing perspective to shed light on how family firms manage risks across multiple IJV decisions.

3.3 Hypotheses

Defined as collaborative arrangements between two or more independent firms headquartered in different countries through the establishment of a separate legal entity (Geringer and Hebert 1989), IJVs represent a distinctive way of pooling resources and capabilities of otherwise independent firms in the pursuit of mutual strategic interests. In particular, IJVs have been effectively utilized by multinational firms (MNEs) as a foreign market entry strategy, as it enables

them to leverage local partners' knowledge and resources to circumvent regulatory (Fagre and Wells 1982; Gomes-Casseres 1989), cultural (Kogut and Singh 1988; Tihanyi, Griffith, and Russell 2005), and institutional barriers (Khanna, Palepu, and Sinha 2005; Y. Luo 1997; 2005). Due to their many strategic advantages, IJVs continue to be a popular means of global expansion for organizations, as evidenced by a dramatic increase in the frequency and magnitude of IJV formation in the past two decades (Perkins, Morck, and Yeung 2014; Nippa and Reuer 2019).

Despite its frequent use, there are a variety of different types and levels of risk associated with IJV, ranging from general environmental uncertainty to institutional risks, industry/market risk as well as agency risk between partnering firms (e.g., Hsieh, Rodrigues, & Child, 2010). In the following section, we theorize about how family firms manage multiple risks stemming from their involvement in IJVs by looking at three key dimensions of IJV decisions.

3.3.1 Relatedness of International Joint Ventures

When firms pursue growth opportunities in the form of IJVs, an important decision that must be made is whether to pursue related or unrelated IJVs. Broadly speaking, IJVs can be classified as related or unrelated depending on the relatedness of their products and markets to the parent firm's business activities (Cui and Kumar 2012). Related IJVs are formed to exploit the current capabilities of the firm and achieve economies of scale through leveraging existing resources, while unrelated IJVs are primarily formed to acquire new resources and capabilities by venturing into different business sectors (Cui and Kumar 2012). In general, while diversifying through unrelated IJVs promise greater financial returns if successful, they tend to be more risky and subject to greater performance shortfalls (Graham, Lemmon, and Wolf 2002; Villalonga 2004). In line with the previous literature that demonstrated family firms' general preference for related diversification (Gomez-Mejia, Makri, and Kintana 2010), and related acquisition (Gomez-Mejia,

Patel, and Zellweger 2018), we expect family firms to prefer related IJVs to unrelated IJVs as the former offer many potential advantages for family firms.

Over time, family members often develop a strong emotional attachment to their firm's core competences including technology, goods, services, and the specialized knowledge which enabled the firm to succeed in the industry (Miller and Le Breton-Miller 2006; Anderson and Reeb 2003). A family's SEW is closely tied to the firm's core business (Hussinger and Issah 2019). Since related IJVs enable family firms to adhere to the values dearest to them, there is lower risk of losing SEW. Indeed, venturing into new business sectors through unrelated IJVs often requires significant changes in a firm's operational structures and management policies, which risks deemphasizing the historical foundations of the family firm (Gomez-Mejia, Makri, and Kintana 2010). By contrast, related IJVs allow family firms to maintain their routines and time-proven methods and thus increase the socioemotional benefits of a coherent firm identity linked to the goals of the family. Furthermore, related IJVs help maintain the family's control over the firm as the need to hire external executives or consultants with the relevant knowledge and skills required to venture into new markets is reduced. In summary, we hypothesize that compared to nonfamily firms, for whom SEW implications are of lesser importance in strategic decision-making, family firms are more inclined to participate in related IJVs than their nonfamily counterparts.

Hypothesis 1a. Family firms are more prone to participate in related IJVs than nonfamily firms.

3.3.2 The Choice of Host Country

The choice of host countries constitutes another risky decision in the establishment of international joint ventures. Joint venture partners need to rely on one another for the fulfillment of their strategic objectives (Geringer and Hebert 1989). This creates intrinsic risks wherein potential information asymmetry between partner firms increases the danger of one party seeking

unilateral gains at the expense of the other partners and/or the joint venture entity such as by breaching the contract, exercising private control, shirking obligations, or expropriating joint earnings (Jean-Francois Hennart 1988; Y. Luo 2007). These risks are particularly acute in cross-border joint ventures (i.e. IJVs), because they involve partners from different countries with diverse cultural and institutional backgrounds (Hsieh, Rodrigues, and Child 2010). Therefore, firms will be concerned with the legal protections offered in the host country to mitigate such risks. Indeed, scholars suggest that the quality of the host country's institutional infrastructure influences firms' concerns regarding their ability to capture a fair share of economic rents generated by the IJVs (Makino and Yiu 2002; Roy and Oliver 2009).

Institutions are commonly recognized as setting the formal (e.g., regulations, judiciary and constitution) and informal (e.g., norms, customs and beliefs) "rules of the game" that establish the basis for how firms operate (Zucker 1987). In institutional environments characterized by poor legal systems, weak property protections and high corruption, the cost of IJV contracting is especially high (Chang et al. 2012). For instance, foreign firms often encounter tremendous challenges in establishing intellectual property rights in countries with weak property rights protections (Oxley 1999). High costs of contracting may also arise from the difficulties associated with safeguarding against opportunism by local government or business partners (Y. Luo 2007). Previous research found that in countries with high political hazards, government officials and other local partners often collude with one another to expropriate foreign entrants (Boisot and Child 1988; Henisz 2000).

While these risks apply to all firms, we argue that family firms will be particularly concerned about the quality of the host country's institutional environment as they pose additional threats to the family's SEW. First, the risk of knowledge (e.g. trade secret) leakage stemming from weak intellectual property protection is likely to be seen as a greater threat by family firms as their SEW

is closely tied to the firm's core knowledge.

Second, collaborating with partners in countries with poor institutional environments also implies that the firm is subject to greater risks of local partners' engagement in activities (e.g., bribery scandal) that may tarnish the parent firm's integrity and reputation which is inherently connected to the owning family's socioemotional endowment. In fact, corporate controversies flourish in countries characterized by weak rules of law due to the lack of reliable mechanisms for safeguarding against such conduct. As such, to minimize potential reputational risk arising from local partners' engagement in controversial events, family firms will be wary of forming IJVs in countries with poor institutional environments, more so than nonfamily firms. Therefore, we hypothesize the following:

Hypothesis 1b. Family firms are more likely to establish IJVs in countries characterized by strong institutional environments than nonfamily firms.

3.3.3 The Choice of Number of IJV Partners

When forming an IJV, another risky decision that a firm must make is the number of partners to include. The most common form of IJVs involves two parent firms, but multiparty IJVs are becoming increasingly popular. For instance, 55% of international joint ventures were classified as multiparty IJVs in Makino and Beamish's (1998) study, while in Garcia-Canal, Valdés-Llaneza, and Ariño's (2003) study, 49% of IJVs created by Spanish companies with more than two partners. Likewise, multiparty IJVs account for 25% and 30%, respectively, of Griffith, Hu, and Chen's (1998) and Gong, Shenkar, Luo, and Nyaw's (2007) sample of Chinese IJVs.

Current research offers two opposing views on whether an increased number of partners is helpful or damaging to IJV performance. One stream builds on the resource-based view and underscores the benefits of heterogeneous resources attainable by involving more diverse partners (Beamish and Kachra 2004). A different strand of research, based on transaction costs view,

suggests that as the number of partners increases, IJV performance may suffer from the higher costs and difficulty of coordinating several parties (Jean-François Hennart and Zeng 2005). While it remains largely unknown whether the benefits of additional resources in multiparty IJVs outweigh the increased coordination costs, we expect family firms to prefer multiparty IJVs to mitigate the risk stemming from the high failure rate of IJVs. Indeed, an estimated 37-70% of IJVs end up failing (Klijn et al. 2013; Park and Harris 2014). Because family firms are usually loss averse with regard towards both their socioemotional and financial wealth, they are likely to be more concerned about the consequences of IJV failure than nonfamily firms, as IJV failures may pose a direct threat to the family's socioemotional wealth as well as financial wealth. In fact, IJV failure can result in major damage to the firm's reputation. Since reputation is an important element of SEW, multiparty IJVs may be favored by the owning family because the responsibility for failure, as well as the financial losses, will be shared by multiple firms. In line with this reasoning, we hypothesize that:

Hypothesis 1c. Family firms are more prone to participate in multiparty IJVs than nonfamily firms.

3.3.4 Narrow-Framing Tendencies in Managing Multiple IJV Decisions

We have argued thus far that family firms are different from nonfamily firms in their approach to three vital strategic choices regarding international joint ventures: 1) type of IJVs formed; 2) the choice of host country; and 3) the number of IJV partners. When examining these decisions, however, firms may consider them as a group or in isolation. In other words, the IJV selected will depend on whether the choice of a specific IJV type, the host country, and the number of IJV partners are framed broadly or narrowly. We contend that while decisions made by nonfamily firms are often more prone to be narrowly framed, family firms decisions are more likely to be taken into account as a group.

As mentioned above, narrow framing inhibits the utilization of diversification strategies across multiple risk-taking prospects, which requires joint analysis by definition. Read and Loewenstein (1995) suggests *choice bracketing* as one of the major factors causing narrow framing, i.e., the tendency to treat decisions framed together differently from those framed apart. According to Kahneman & Lovallo (1993), how outcomes after decisions are assessed within organizations significantly determines the degree to which narrow framing permeates organizational contexts. More specifically, narrow framing is influenced by the way in which a manager's performance is measured and the frequency of performance evaluations (Kahneman and Lovallo 1993). If performance evaluation entails a lower tolerance for failures, the likelihood of managers treating decisions in insolation is likely to increase accordingly. Likewise, the higher the frequency of performance evaluation, the greater the likelihood of narrow framing because managers will be assessed on the immediate effects of their strategic decisions. In contrast, if tolerance for failure is high and the performance evaluations happen infrequently, narrow framing is less likely to happen.

Family firms, in this regard, are known to possess several unique characteristics that confer less vulnerability to narrow framing than other firms. First, family firms are generally noted for making decisions focusing on long term goals and continuity (G Tom Lumpkin and Brigham 2011), defined as "the tendency to prioritize the long-range implications and impact of decisions and actions that come to fruition after an extended time period" (Lumpkin, Brigham, & Moss, 2010: 241). As such, decision makers in family firms are less likely to be evaluated based on the immediate outcome of a single decision but more on the aggregate results of multiple decisions over an extended period. As a result, narrow framing is less prevalent in family businesses. In addition, unified ownership and control also gives family firms' decision-makers greater discretion and makes them less likely to be blamed when decisions go wrong (Carney 2005), which may

decrease inclinations to engage in narrow framing. As a result, family firms have been found to manage multiple decisions more as a group than nonfamily firms (Fang et al. 2021).

Given the lower likelihood of narrow framing, we predict that when exploring multiple IJV decisions in different functional areas, family firms will utilize a risk-diversifying strategy to ensure that the aggregate level of risk is manageable. That is, given increased (decreased) risk taken in one dimension, family firms will be apt to make choices in another dimension that have lower (higher) risk. For instance, although family firms generally prefer related IJVs, they may at times pursue unrelated IJVs to explore new opportunities in a new industry or to spread overall firm risk across multiple industries. However, since unrelated IJVs entail greater risk than related IJVs, they may attempt to mitigate risk in the other two decision dimensions to ensure the overall risk associated with IJVs is manageable. That is, family firms will tend to establish an IJV in countries characterized by strong institutional protection and/or involve more partners in the venture (i.e. multiparty IJVs) to offset the increased risk from pursuing unrelated IJVs. Similarly, despite their general reluctance to enter countries with poor institutional protections, they may nonetheless do so at times. Under such circumstances, we expect that family firms will be inclined to pursue related IJVs and/or involve more partners in the venture to ensure that the overall risk remains manageable. Likewise, when family firms choose to engage in dyadic IJVs, we expect that they will pursue related IJVs and/or establish the IJVs in countries characterized by strong institutional protections to manage the overall risk associated with IJVs.

In contrast, given the high probability of narrow framing in nonfamily firms, we expect these three decisions to be treated in isolation such that the level of risk taken in one decision will have a lower impact on the level of risk taken in the other decision.

Hypothesis 2. Family involvement in a firm negatively moderates the relationship between the level of risk taken in one IJV decision and the level of risk taken in another IJV decision.

It is important to note again, however, that unlike prior research that looked at two fundamentally different strategic decisions (Fang et al. 2021), we focus on multiple dimensions of a single strategic decision: the decision to engage in IJVs. While the propensity for narrow or broad framing is likely to be particularly salient in the former case as fundamentally different risky decisions (e.g., R&D investment and internationalization) tend to be isolated by decision makers, we expect this tendency to occur with decisions with multiple dimensions, each of which creates its own special type of risk (i.e., business, environmental, agency).

Furthermore, the possibility that such decisions will be made sequentially raises the chance of narrow-framing (Brouthers and Bamossy 1997; Roy and Oliver 2009; Xu, Hitt, and Miller 2020). As a major factor leading to narrow framing, sequential choices are more likely to be considered in isolation than simultaneous choices as the latter is more likely to be viewed as a type of portfolio choice (Read and Loewenstein 1995). A large body of research on internationalization suggests that firms make expansion decisions in a stage-wise manner, from the selection of target country to the choice of entry mode (Johanson and Vahlne 1977; Davidson 1980; Xu, Hitt, and Miller 2020). Likewise, the sequential nature of decision-making in the context of IJVs can be characterized by four stages: country selection, partner selection, negotiation and agreement of governance terms, and management of the IJV (Brouthers and Bamossy 1997; Roy and Oliver 2009; Y. Luo 2005). Given that there exists a time interval between different stages, firms are likely to be susceptible to the problem of narrow framing when approaching multiple dimensions of IJV decisions.

3.4 Methods

3.4.1 Data and Sample

Our study is based on a sample of IJVs undertaken by US-based firms in the S&P 1500 from

1997 to 2014. IJV formation information was drawn from the SDC Platinum database by Thomson Reuters, which has been widely accepted as a highly reliable source for conducting IJV research (Xia, Tan, and Tan 2008; Gulati and Wang 2003). Following previous studies (Reuer 2000), we only considered IJVs with U.S. parent firms in this study because it enables us to control for unobserved factors originating from the interactions between IJVs and regulations in the parent firms' home countries and because it simplifies the interpretation of our empirical results.

We collected family firm information from Hoover's, ExecuComp, Fundinguniverse.com, ancestry.com, and firm websites. Information regarding family ownership and governance were extracted from the annual proxy statement through Edgar portal from the U.S. Security and Exchange Commission. Financial data on parent firms (e.g., total asset, leverage, market-to-book ratio, sales growth, profit, tangibility, tax status, Altman Z-score, and liquidity) were gathered from the Compustat database. After merging all the datasets and eliminating missing values, our final sample includes 2,166 joint venture observations, among which 1,439[6] were classified as international joint ventures. Thus, our unit of analysis is the IJV deal. Since we were not able to capture when the decisions on type of deal, host country, and number of partners were made, our measure of the IJV dimensions were cross-sectional in nature. However, we were able to use 1-year time lags between the dependent variables and the control variables.

3.4.2 Measures

[6] These international joint ventures are located in 89 foreign countries and regions. The Herfindahl-Hirschman Index of IJV distribution is 748.492, indicating a reasonable level of variation in this variable. In addition, for the regressions in which the host country's institutional environment was used as either independent or dependent variable, the sample is further reduced to 1,281 observations as 158 IJV deals in our sample did not specify the country in which the IJV is established.

Our dependent variables include three IJV decisions: relatedness of IJVs, the host country's institutional environment and the number of IJV partners. Consistent with our theory, we measure each dimension of the IJVs separately and when we use one as a dependent variable, the other two are used as independent variables.

Consistent with previous studies (Graham, Lemmon, and Wolf 2002; Cui and Kumar 2012), IJV relatedness is measured by comparing the industry of the IJV entity and the US parent firm. To measure industry, we follow Hirshleifer, Lim and Teoh (2009), Wang (2012) and Fich, Gordon and Yore (2021) and use Fama-French's 10-industry classification[7]. *RelatedIJV* is equal to 1 if the IJV is in same industry as the U.S. parent firm, and 0 otherwise. The host country's institutional environment (*Institution*) was measured by using a formal institution index (Berrone et al. 2020), which is composed of 5 components: common law origin, anti-self-dealing index, creditor rights, minority shareholder rights, and judicial efficiency. Following Berrone et al. (2020), we used the normalized score of the institution index to proxy the aggregate rating for a country's institutional environment. Higher index values indicate better protection in the institutional environment. Number of IJV partners was measured using a binary variable, *Multiparty,* which is set to 1 if a joint venture involved more than two partners, and 0 otherwise.

We used multiple measures of family involvement as moderator variables. The literature identifies family firms by a family's participation and the degree to which the family, perhaps

[7] The 10 industries in the Fama-French classification are: (1) Consumer Nondurables: Food, Tobacco, Textiles, Apparel, Leather, Toys; (2) Consumer Durables: Cars, TVs, Furniture, Household Appliances; (3) Machinery, Trucks, Planes, Chemicals, Office Furniture, Paper, Custom Printing; (4) Energy: Oil, Gas, and Coal Extraction and Products; (5) Business Equipment: Computers, Software, and Electronic Equipment; (6) Telephone and Television Transmission; (7) Wholesale, Retail, and Some Services (Laundries, Repair Shops); (8) Healthcare, Medical Equipment, and Drugs; (9) Utilities; (10) Other -- Mines, Construction, Transportation, Hotels, Entertainment, Finance, etc. Utility firms are excluded from our sample.

through generations, shapes the firm's vision (Chua, Chrisman, and Sharma 1999; Anderson and Reeb 2003). Consistent with this definition, we used two binary variables to denote whether a firm is classified as a family firm or nonfamily firm. *FamilyFirm1*, is set to equal one if family members hold at least 5 percent ownership of the firm in previous year and at least two family members who are or have been involved as top managers or directors in the firm in its history. In addition, to further ensure that the current vision of the firm is shaped by a family's active involvement in the business, we employed an additional measure, *FamilyFirm2*, which is coded as one if a family member is currently serving as CEO and/or Board Chair of the firm in addition to the family holding 5 percent ownership in the firm in previous year and there being more than one other family member who is or has been served on top management team or the board of directors in its history (0 otherwise).`

The following lagged control variables were included due to their potential influence on firms' engagement in IJVs. First, because lone-founder firms have shown to behave differently than family firms (Miller et al. 2007), we used two binary variables to control for such difference. *LoneDum1* is coded as 1 if one founder holds at least 5% of the shares in the firm in previous year, but no other family members are currently or have ever worked for the firm, and 0 otherwise. Similarly, *LoneDum2* is coded as 1 if one founder holds at least 5% of shares in previous year and family member serve as CEO and/or Board Chair with no other family members involved in the firm in its history (0 otherwise).

Second, we controlled for the possible effects of US parent firms using several variables lagged at t-1. In particular, we controlled for *firm size* (log of one plus total assets), *firm leverage* (debt to total asset ratio), *market to book ratio* (the aggregate of the net value of total property, plant and equipment divided by total assets), and *tangibility* (total inventory divided by total assets), as these variables may affect the amount of resources available to the firm and hence its

propensity to form an IJV as well as its subsequent decisions on the characteristics of the IJV.

Moreover, financial performance may also affect firm's IJV relevant decisions because good performers tend to have greater resources available to develop their businesses. For that reason, we also controlled for firms' financial performance using several variables including *firm growth* (sales growth rate), *profit* (the ratio of earnings before interest and taxes to total assets), *liquidity* (coded 1 if a firm has negative net cash flow from operating activities and 0 otherwise), *tax status* (coded 1 if a firm has positive tax loss carry forward and 0 otherwise), *Altman Z-score* (the likelihood of bankruptcy), and *volatility of company returns* (standard deviation of the past 60 months of stock returns). Lastly, to control for the influence of unobserved industrial characteristics and time-variant factors, we also included industry dummy variables and year dummy variables. Table 3.1 provides a detailed description of all the variables used in the study.

3.4.3 Empirical Models

We use Equation (1) to (3) to examine H1a to H1c, respectively. Family firms are loss averse regarding their financial endowment and SEW, they are more likely to engage in related IJVs, since related IJVs allow them to maintain their emotional attachment to their firm's core competences and family's control (Anderson and Reeb 2003; Gomez-Mejia, Makri, and Kintana 2010). Thus, we predict that the coefficient of *FamilyFirm1* in Equation (1) will be positive. Forming IJVs in a country with good governance institution reduced the risk related to IJVs (Jean-Francois Hennart 1988; Y. Luo 2007; Makino and Yiu 2002; Roy and Oliver 2009), which is more important to family firms, because they pose additional threat to the family's SEW. Therefore, we expect that the coefficient of *FamilyFirm1* in Equation (2) will be positive. Furthermore, IJV failure may pose a direct threat to the family's financial wealth and SEW, we expect that family firms to prefer multiparty IJVs as they concern more about the consequences of IJV failure than

nonfamily firms. Thus, we anticipate a positive relationship between *MultiParty* and *FamilyFirm1* in Equation (3).

To test H2, we introduce the interaction term between *Institution* and *FamlyFirm1* and the interaction term between *MultiParty* and *FamilyFirm1* in Equation (4) and (5), respectively. Given the loss aversion and lower probability of narrow framing (Lumpkin, Brigham, & Moss, 2010; Carney 2005; Fang et al. 2021), we expect that family firms are more prone to use risk-diversifying strategy to manage total risk that related with IJV. Therefore, we anticipate that the coefficients of both interaction terms are negative. Furthermore, we regress *Institution* on the interaction term between *RelatedIJV* and *FamlyFirm1* and the interaction term between *MultiParty* and *FamilyFirm1* in Equation (6) and (7), respectively. We also regress *MultiParty* on the interaction term between *RelatedIJV* and *FamlyFirm1* and the interaction term between *Institution* and *FamlyFirm1* in Equation (8) and (9), respectively. We predict that all coefficients of the interaction terms are negative.

$$RelatedIJV_t = \beta_0 + \beta_1 FamilyFirm1_{t-1} + \beta_2 Controls + \epsilon_1 \quad (1)$$

$$Institution_t = \beta_0 + \beta_1 FamilyFirm1_{t-1} + \beta_2 Controls + \epsilon_1 \quad (2)$$

$$MultiParty = \beta_0 + \beta_1 FamilyFirm1_{t-1} + \beta_2 Controls + \epsilon_1 \quad (3)$$

$$RelatedIJV_t = \beta_0 + \beta_1 FamilyFirm1_{t-1} + \beta_2 Institution_t + \beta_1 FamilyFirm_{1,t-1} * Institution_t + \beta_2 Controls + \epsilon_1 \quad (4)$$

$$RelatedIJV_t = \beta_0 + \beta_1 FamilyFirm_{1,t-1} + \beta_2 MultiParty_t + \beta_1 FamilyFirm_{1,t-1} * MultiParty_t + \beta_2 Controls + \epsilon_1 \quad (5)$$

$$Institution_t = \beta_0 + \beta_1 FamilyFirm_{1,t-1} + \beta_2 RelatedIJV_t + \beta_1 FamilyFirm_{1,t-1} * RelatedIJV_t + \beta_2 Controls + \epsilon_1 \quad (6)$$

$$Institution_t = \beta_0 + \beta_1 FamilyFirm_{1,t-1} + \beta_2 MultiParty_t + \beta_1 FamilyFirm_{1,t-1} * MultiParty_t + \beta_2 Controls + \epsilon_1 \quad (7)$$

$$MultiParty_t = \beta_0 + \beta_1 FamilyFirm_{1,t-1} + \beta_2 RelatedIJV_t + \beta_1 FamilyFirm_{1,t-1} * RelatedIJV_t + \beta_2 Controls + \epsilon_1 \quad (8)$$

$$MultiParty_t = \beta_0 + \beta_1 FamilyFirm_{1,t-1} + \beta_2 Institution_t + \beta_1 FamilyFirm_{1,t-1} * Institution_t + \beta_2 Controls + \epsilon_1 \quad (9)$$

Table 3.1 Variable Definitions

Variable	Measurement	Sources
RelatedIJV	A binary variable. It is equal to one if US parent firm and the joint venture are in related industries, 0 otherwise.	SDC
Institution	A index measuring the host country's institutional environment (Dau, 2013; Berrone et al., 2020), which is composed of 5 components: common law origin, anti-self-dealing index, creditor rights, minority shareholder rights, and judicial efficiency. The composite index is normalized (Berrone et al., 2020).	SDC
MultiParty	A binary variable, which is equal to one if there are more than two partners involved in an international joint venture, zero otherwise.	SDC
FamilyFirm1	A binary variable, which is set to one if a family holds at least 5% of shares in the firm in previous year, and at least two family members who have served or are currently serving as significant owners, managers, or board directors in its history, zero otherwise.	Hand-collected
FamilyFirm2	A binary variable, which is set to one if a family holds at least 5% of shares in the firm in previous year, at least two family members who have served or are currently serving as significant owners, managers, or board directors, and family member serve as CEO or Chairman in its history, zero otherwise.	Hand-collected
FamilyFirm3	A binary variable, which is coded as one if a family holds at least 20% of shares in the firm in previous year, and at least two family members who have served or are currently serving as significant owners, managers, or board directors in its history, zero otherwise	Hand-collected
LoneDum1	A binary variable, which is equal to one, if the founder holds at least 5% of voting share in previous year, and no other family members serve in the firm in its history.	Hand-collected
LoneDum2	A binary variable, which is equal to one, if the founder holds at least 5% of voting share in prior year, and family member serve as CEO and/or Board Chair with no other family members involved in the firm in its history, zero otherwise.	Hand-collected
Asset	The logarithm of one plus total asset.	Compustat
Leverage	Long-term debt ratio.	Compustat
MTB	Market-to-book ratio.	Compustat
Growth	Sales growth rate in previous year ($(Sale_{t-1} - Salet_{-2})/Sale_{t-2}$).	Compustat
Profit	Earnings before interest and taxes over total asset.	Compustat
Tangibility	The sum of the net value of total property, plant and equipment, and total inventory, scaled by total assets.	Compustat
Tax Status	A binary variable, which is equal to one if a firm has positive tax loss carry forward, zero otherwise.	Compustat
AltmanZ	Altman Z-score.	Compustat
Liquidity	A binary variable, which is set to one if a firm has negative net cash flow from operating activities.	Compustat

Volatility	The standards deviations of the previous 60 months stock return.	Compustat

Note: This table reports the definitions of all the variables used in Essay 2.

3.5 Results

3.5.1 Main Results

Tables 3.2 presents descriptive statistics. Depending on the operational measure employed, family firms account for 12.3% (*FamilyFirm1*) to 8.5% (*FamilyFirm2*) of all the firms in our sample, while 8.1% (*LonDum1*) to 4.2% (*LonDum2*) of firms were classified as lone-founder firms. The ratios are consistent with previous research that used either the entire Fortune 1000 database (Miller et al., 2007) or S&P 1500 manufacturing firms (Fang et al., 2021) as samples. Thus, although the use of IJVs might pose a threat of selection bias, it appears that the distributions of family and lone-founder firms are not affected. Of all the IJV deals, 58.7% were classified as related IJVs while 19.9% of deals involved more than two parent firms. According to the correlation matrix presented in Table 3.3, all the dependent variables are strongly correlated with the family firm variable in the predicted direction. Family firms also appear to be smaller in size, have lower total assets, and use less leverage compared to their nonfamily counterparts, which is consistent with prior research on family firms.

We tested our hypotheses using a probit model for our binary dependent variables (i.e., IJV relatedness and multiparty) and an ordinary least square regression model for our continuous dependent variable (i.e., host country's institutional environment). We used the Huber-White corrected estimator, which is clustered at the firm level, to mitigate potential heteroscedasticity and serial correlation (Judson and Owen 1999). As noted above, we also employed a one-year lag between dependent variables and other variables to mitigate the impact of potential reverse causality.

In addition, while we focus on international joint ventures in this study, family may differ from nonfamily firms in their preference for IJVs and domestic JVs. This raises a concern about potential selection bias because firm's initial decision to engage in either IJVs or domestic JVs

may have an impact on their subsequent decisions regarding the nature of the IJV selected. To address this issue, we employed the Heckman (1979)'s two-step procedure. We first run probit models to investigate whether family firms are indeed more or less likely than nonfamily firms to form IJVs as opposed to JVs. The binary variable, *IJV*, equal to 1 if the joint venture is an international one and 0 if it is a domestic JV. As can be seen in Columns (1) and (2) in Table 3.4, family firms are less prone to opt for IJVs than their non-family peers, using both of our measures of family involvement (*FamilyFirm1*: b = -0.233, $p < 0.01$; *FamilyFirm2*: b = -0.309, $p < 0.01$). This suggests that self-selection bias exists. Hence to alleviate its potential impact on firms' IJV relevant decisions (e.g., relatedness), we calculated the inverse Mills ratios and used them as control variables for hypothesis testing. Since our study focuses on the multiple decisions a firm makes in the context of IJVs, our initial sample of 2,166 JV deals (including both international and domestic) is reduced to 1,439 IJV deals only.

Table 3.4 presents the results of Hypotheses 1a-1c. H1a predicted that family firms are more inclined to participate in related IJVs than nonfamily firms. As presented in Columns (3) and (4), the coefficients of the family firm variables are positive and significant (*FamilyFirm1*: $b = 0.379$, $p < 0.05$; *FamilyFirm2*: $b = 0.583$, $p < 0.01$). Thus, H1a is supported.

H1b predicted that family firms are more likely to establish an IJV in countries characterized by strong institutional environment than nonfamily firms. As seen in Columns (5) and (6), the coefficients of the family firm variables are positive and significant (*FamilyFirm1*: $b = 0.074$, $p < 0.001$; *FamilyFirm2*: $b = 0.087$, $p < 0.05$). Therefore, H1b is also supported.

Lastly, H1c predicted that family firms are more prone to participate in multiparty IJVs than nonfamily firms. Columns (7) and (8) show that the coefficients of the family firm variables are positive and significant (*FamilyFirm1*: $b = 0.550$, $p < 0.001$; *FamilyFirm2*: $b = 0.551$, $p < 0.01$). Thus, H1c is confirmed.

Table 3.2 Descriptive Statistics

Variable	Full sample						*Non-Family Firm*		*Family Firm*		Difference (NFF-FF)
	N	Mean	S.D.	0.25	Median	0.75	N	Mean	N	Mean	
RelatedIJV	1,439	0.587	0.493	0.000	1.000	1.000	1,262	0.579	177	0.649	-0.070*
Institution	1,281	0.563	0.217	0.490	0.570	0.700	1,118	0.559	163	0.592	-0.033*
MultiParty	1,439	0.199	0.399	0.000	0.000	0.000	1,262	0.189	177	0.271	-0.082***
FamilyFirm1	1,439	0.123	0.329	0.000	0.000	0.000	-	-	-	-	-
FamilyFirm2	1,439	0.085	0.279	0.000	0.000	0.000	-	-	-	-	-
FamilyFirm3	1,439	0.067	0.25	0.000	0.000	0.000	-	-	-	-	-
LoneDum1	1,439	0.081	0.273	0.000	0.000	0.000	-	-	-	-	-
LoneDum2	1,439	0.042	0.202	0.000	0.000	0.000	-	-	-	-	-
Asset	1,439	9.322	1.470	8.396	9.724	10.723	1,262	9.439	177	8.485	0.954***
Leverage	1,439	0.185	0.128	0.096	0.171	0.259	1,262	0.181	177	0.212	-0.031***
MTB	1,439	4.615	4.599	1.929	3.057	5.488	1,262	4.918	177	2.455	2.463***
Growth	1,439	0.109	0.242	0.01	0.072	0.152	1,262	0.111	177	0.093	0.018
Profit	1,439	0.071	0.069	0.03	0.058	0.095	1,262	0.073	177	0.057	0.016***
Tangibility	1,439	0.327	0.202	0.137	0.301	0.461	1,262	0.318	177	0.395	-0.077***
TaxStatus	1,439	0.345	0.475	0.000	0.000	1.000	1,262	0.342	177	0.367	-0.025
AltmanZ	1,439	4.698	5.923	1.541	3.009	4.570	1,262	4.891	177	3.327	1.564***
Liquidity	1,439	0.031	0.172	0.000	0.000	0.000	1,262	0.031	177	0.028	0.003
Volatility	1,439	0.099	0.050	0.067	0.087	0.119	1,262	0.098	177	0.110	-0.012***

Note: This table shows summary statistics for all variables for the full sample, as well as the family-firm and the non-family-firm subsamples. *RelatedIJV* is equal to one if US parent firm and the joint venture are in related industries, 0 otherwise. *Institution is* an index measuring the host country's institutional environment (Dau, 2013; Berrone et al., 2020), which is composed of 5 components: common law origin, anti-self-dealing index, creditor rights, minority shareholder rights, and judicial efficiency. The composite index is normalized (Berrone et al., 2020). *MultiParty* equals to one if there are more than two partners involved in an international joint venture, zero otherwise. *FamilyFirm1* is set to one if a family holds at least 5% of shares in the firm in prior year, and at least two family members who have served or are currently serving as significant owners, managers, or board directors since the beginning of the sample period to prior year, zero otherwise. *FamilyFirm2* is set to one if a family holds at least 5% of shares in the firm in prior year, at least two family members who have served or are currently serving as significant owners, managers, or board directors, and family member serve as CEO or Chairman since the beginning of the sample period to prior year, zero otherwise. *FamilyFirm3* is coded as one if a family holds at least 20% of shares in the firm in prior year, and at least two family members who have served or are currently serving as significant owners, managers, or board directors since the beginning of the sample period to prior year, zero otherwise. *LoneDum1* is equal to one, if the founder holds at least 5% of voting share in prior year, and no other family members serve in the firm since the beginning of the sample period to prior year, 0 otherwise. *LoneDum2* is equal to one, if the founder holds at least 5% of voting share in prior year, and family member serve as CEO and/or Board Chair with no other family members involved in the firm since the beginning of the sample period to prior year, zero otherwise. *Asset* is the natural logarithm of one plus total asset. *Leverage* is long-term debt ratio. *MTB* is market-to-book ratio. *Growth* is sales growth rate in prior year ($(Sale_{t-1}-Sale_{t-2})/Sale_{t-2}$). *Profit* is earnings before interest and taxes over total asset. *Tangibility* is the sum of the net value of total property, plant and equipment, and total inventory, scaled by total assets. *TaxStatus* is equal to one if a firm has positive tax loss carry forward, zero otherwise. *AltmanZ* is altman Z-score. *Liquidity* is set to one if a firm has negative net cash flow from operating activities. *Volatility* is the standards deviations of the previous 60 months stock return. P-value in parentheses. *, **, *** represent significance at 10%, 5% and 1% levels, respectively.

Table 3.3 Correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) RelatedIJV	1.000								
(2) Institution	-0.067**	1.000							
(3) MultiParty	-0.046*	0.035	1.000						
(4) FamilyFirm1	0.048*	0.070***	0.068***	1.000					
(5) FamilyFirm2	0.083***	0.056**	0.048*	0.841***	1.000				
(6)FamilyFirm3	0.073***	0.042*	0.040	0.746***	0.768***	1.000			
(7) LoneDum1	0.089***	0.086***	0.119***	-0.124***	-0.104***	-0.093***	1.000		
(8) LoneDum2	0.078***	0.079***	0.129***	-0.091***	-0.076***	-0.068***	0.732***	1.000	
(9) Asset	-0.100**	-0.010	0.068***	-0.198***	-0.204***	-0.186***	0.003	-0.034	1.000
(10) Leverage	-0.070**	-0.064***	-0.046*	0.102***	0.076***	0.053**	-0.296***	-0.176***	0.132***
(11) MTB	0.005	0.052**	0.142***	-0.178***	-0.164***	-0.113***	0.388***	0.394***	0.113***
(12) Growth	-0.050*	0.058***	-0.006	-0.043**	-0.047**	-0.005	0.310***	0.241***	-0.217***
(13) Profit	0.095***	0.034	0.089***	-0.096***	-0.091***	-0.058***	0.519***	0.413***	-0.013
(14) Tangibility	0.156***	-0.102***	-0.036	0.147***	0.184***	0.138***	-0.228***	-0.179***	-0.286***
(15) TaxStatus	0.065**	-0.048**	-0.083***	0.047**	0.092***	0.072***	-0.077***	-0.010	-0.113***
(16) AltmanZ	0.072***	0.074***	0.151***	-0.098***	-0.083***	-0.056***	0.642***	0.532***	-0.113***
(17) Liquidity	0.026	0.016	0.023	0.014	-0.007	-0.164***	-0.014	0.013	-0.159***
(18) Volatility	0.065**	0.039	0.073***	0.052**	0.074***	0.015	0.261***	0.187***	-0.379***

Variables	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(10) Leverage	1.000								
(11) MTB	-0.338***	1.000							
(12) Growth	-0.152***	0.297***	1.000						
(13) Profit	-0.446***	0.415***	0.176***	1.000					
(14) Tangibility	0.139***	-0.289***	-0.141***	-0.090***	1.000				
(15) TaxStatus	0.013	-0.107***	-0.062***	-0.031	0.089***	1.000			
(16) AltmanZ	-0.516***	0.622***	0.363***	0.688***	-0.198***	-0.089***	1.000		
(17) Liquidity	0.047**	-0.035*	0.091***	-0.163***	0.031	0.011	-0.036*	1.000	
(18) Volatility	-0.107***	0.169***	0.362***	0.032	-0.003	0.021	0.327***	0.203***	1.000

Note: This table shows Pearson Correlations. *RelatedIJV* is equal to one if US parent firm and the joint venture are in related industries, 0 otherwise. *Institution is* an index measuring the host country's institutional environment (Dau, 2013; Berrone et al., 2020), which is composed of 5 components: common law origin, anti-self-dealing index, creditor rights, minority shareholder rights, and judicial efficiency. The composite index is normalized (Berrone et al., 2020). *MultiParty* equals to one if there are more than two partners involved in an international joint venture, zero otherwise. *FamilyFirm1* is set to one if a family holds at least 5% of shares in the firm in prior year, and at least two family members who have served or are currently serving as significant owners, managers, or board directors since the beginning of the sample period to prior year, zero otherwise. *FamilyFirm2* is set to one if a family holds at least 5% of shares in the firm in prior year, at least two family members who have served or are currently serving as significant owners, managers, or board directors, and family member serve as CEO or Chairman since the beginning of the sample period to prior year, zero otherwise. *FamilyFirm3* is coded as one if a family holds at least 20% of shares in the firm in prior year, and at least two family members who have served or are currently serving as significant owners, managers, or board directors since the beginning of the sample period to prior year, zero otherwise. *LoneDum1* is equal to one, if the founder holds at least 5% of voting share in prior year, and no other family members serve in the firm since the beginning of the sample period to prior year, 0 otherwise. *LoneDum2* is equal to one, if the founder holds at least 5% of voting share in prior year, and family member serve as CEO and/or Board Chair with no other family members involved in the firm since the beginning of the sample period to prior year, zero otherwise. *Asset* is the natural logarithm of one plus total asset. *Leverage* is long-term debt ratio. *MTB* is market-to-book ratio. *Growth* is sales growth rate in prior year ($(Sale_{t-1}-Sale_{t-2})/Sale_{t-2}$). *Profit* is earnings before interest and taxes over total asset. *Tangibility* is the sum of the net value of total property, plant and equipment, and total inventory, scaled by total assets. *TaxStatus* is equal to one if a firm has positive tax loss carry forward, zero otherwise. *AltmanZ* is altman Z-score. *Liquidity* is set to one if a firm has negative net cash flow from operating activities. *Volatility* is the standards deviations of the previous 60 months stock return. *, **, *** represent significance at 10%, 5% and 1% levels, respectively.

Table 3.4 Regression Analyses for Hypotheses 1a-1c

VARIABLES	(1) *IJV*	(2) *IJV*	(3) *RelatedIJV*	(4) *RelatedIJV*	(5) *Institution*	(6) *Institution*	(7) *MultiParty*	(8) *MultiParty*
FamilyFirm1	-0.233***		0.379**		0.074***		0.550***	
	(0.009)		(0.012)		(0.001)		(0.000)	
FamilyFirm2		-0.309***		0.583***		0.087***		0.551***
		(0.003)		(0.002)		(0.002)		(0.003)
LoneDum1	*-0.071*		0.505**		0.025		0.125	
	(0.623)		(0.011)		(0.431)		(0.512)	
LoneDum2		-0.170		0.557**		0.019		0.297
		(0.308)		(0.017)		(0.585)		(0.173)
Asset	0.014	0.014	-0.009	0.002	0.003	0.003	0.081**	0.075**
	(0.580)	(0.581)	(0.778)	(0.952)	(0.614)	(0.604)	(0.020)	(0.029)
Leverage	-0.456*	-0.437	0.618	0.585	0.078	0.084	0.423	0.432
	(0.092)	(0.111)	(0.120)	(0.143)	(0.224)	(0.198)	(0.330)	(0.320)
MTB	0.024***	0.025***	-0.018	-0.022	-0.008***	-0.009***	0.021	0.019
	(0.008)	(0.006)	(0.229)	(0.133)	(0.001)	(0.001)	(0.184)	(0.221)
Growth	-0.406***	-0.417***	-0.451**	-0.383*	0.054	0.060*	-0.339	-0.302
	(0.004)	(0.003)	(0.046)	(0.087)	(0.116)	(0.076)	(0.193)	(0.217)
Profit	-0.249	-0.259	2.320***	2.536***	0.152	0.180	-0.937	-0.822
	(0.702)	(0.690)	(0.010)	(0.005)	(0.269)	(0.188)	(0.329)	(0.382)
Tangibility	0.195	0.215	0.834***	0.766***	-0.197***	-0.206***	0.480*	0.434*
	(0.251)	(0.210)	(0.000)	(0.001)	(0.000)	(0.000)	(0.064)	(0.095)
TaxStatus	-0.053	-0.046	0.198**	0.181**	-0.003	-0.003	-0.191*	-0.202**
	(0.430)	(0.498)	(0.024)	(0.040)	(0.844)	(0.824)	(0.052)	(0.041)
AltmanZ	-0.002	-0.001	-0.009	-0.006	0.001	0.001	0.030**	0.027**
	(0.844)	(0.928)	(0.472)	(0.647)	(0.624)	(0.533)	(0.019)	(0.030)
Liquidity	0.110	0.104						
	(0.537)	(0.557)						
Volatility	3.099***	3.199***						
	(0.001)	(0.001)						
IJVinvsmills1			-1.525**		-0.229**		-0.480	
			(0.034)		(0.040)		(0.515)	
IJVinvsmills2				-1.522**		-0.230**		-0.445
				(0.028)		(0.030)		(0.524)
Constant	-0.166	-0.177	0.815	0.715	0.728***	0.730***	-1.693***	-1.591***
	(0.589)	(0.557)	(0.140)	(0.186)	(0.000)	(0.000)	(0.005)	(0.006)
Ind. Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,166	2,166	1,439	1,439	1,281	1,281	1,439	1,439
Pseudo R^2/ Adj. R^2	0.041	0.042	0.085	0.086	0.047	0.046	0.082	0.080
F-stat	-	-	-	-	3.227	3.144	-	-
Chi^2	1,966.210	1,865.560	141.295	143.537	-	-	1,180.937	1,218.720

Note: This table reports the effects of family involvement on *RelatedIJV*, *Institution* and *MultiParty*. *RelatedIJV* is equal to one if US parent firm and the joint venture are in related industries, 0 otherwise. *Institution is* an index measuring the host country's institutional environment (Dau, 2013; Berrone et al., 2020), which is composed of 5 components: common law origin, anti-self-dealing index, creditor rights, minority shareholder rights, and judicial efficiency. The composite index is normalized (Berrone et al., 2020). *MultiParty* equals to one if there are more than two partners involved in an international joint venture, zero otherwise. *FamilyFirm1* is set to one if a family holds at least 5% of shares in the firm in prior year, and at least two family members who have served or are currently serving as significant owners, managers, or board directors since the beginning of the sample period to prior year, zero otherwise. *FamilyFirm2* is set to one if a family holds at least 5% of shares in the firm in prior year, at least two family members who have served or are currently serving as significant owners, managers, or board directors, and family member serve as CEO or Chairman since the beginning of the sample period to prior year, zero otherwise. *LoneDum1* is equal to one, if the founder holds at least 5% of voting share in prior year, and no other family members serve in the firm since the beginning of the sample period to prior year, 0 otherwise.

LoneDum2 is equal to one, if the founder holds at least 5% of voting share in prior year, and family member serve as CEO and/or Board Chair with no other family members involved in the firm since the beginning of the sample period to prior year, zero otherwise. *Asset* is the natural logarithm of one plus total asset. *Leverage* is long-term debt ratio. *MTB* is market-to-book ratio. *Growth* is sales growth rate in prior year ($(Sale_{t-1} - Sale_{t-2})/Sale_{t-2}$). *Profit* is earnings before interest and taxes over total asset. *Tangibility* is the sum of the net value of total property, plant and equipment, and total inventory, scaled by total assets. *TaxStatus* is equal to one if a firm has positive tax loss carry forward, zero otherwise. *AltmanZ* is altman Z-score. *Liquidity* is set to one if a firm has negative net cash flow from operating activities. *Volatility* is the standards deviations of the previous 60 months stock return. P-value in parentheses. *, **, *** represent significance at 10%, 5% and 1% levels, respectively.

Table 3.5 presents the results of Hypotheses 2 using the first family firm variable (*FamilyFirm1*). Family firms are more prone to diversify risks across multiple IJV decisions than nonfamily firms. As shown in Columns (1) and (2) of Table 3.5, the dependent variable is the relatedness of the IJV, the coefficients of the interaction term between *FamilyFirm*1 and *Institution* (Model 1; *FamilyFirm1*Institution*: b = -2.031, $p < 0.001$) and the interaction between *FamilyFirm*1 and *Multiparty (*Model 2; *FamilyFirm1*Multiparty*: b = -0.607, $p < 0.05$) are negative and significant. Parts (A) and (B) of Figure 1 shows that for family firms (*FamilyFirm1*=1), the negative relationship between *RelatedIJV* and *Institution* and the negative relationship betwe*en RelatedIJV* and *Institution* are more pronounced than non-family firms (*FamilyFirm1*=0). These findings indicate that when the host country poses high (low) institutional risk or dyadic (multiparty) IJVs are formed, family firms are often more likely than their nonfamily peers to participate in related (unrelated) IJVs to balance the overall risk of the IJV.

Likewise, Columns (3) and (4) show that when the institutional environment of the IJV is the dependent variable the coefficients of the interaction between *FamilyFirm*1 and *RelatedIJV* (Model 3; *FamilyFirm1*RelatedIJV*: $b = -0.108$, $p < 0.01$) and the interaction term between *FamilyFirm*1 and *Multiparty* (Model 4; *FamilyFirm1*Multiparty*: $b = -0.073$, $p < 0.10$) are negative and significant. Parts (C) and (D) of Figure 1 shows that family involvement (*FamilyFirm1*) strengthens the negative relationship between *Institution* and *RelatedIJV,* and negative association between *Institution* and *MultiParty*. This means that compared to nonfamily firms, when engaging in unrelated (related) IJVs or forming dyadic (multiparty) IJVs, both of which pose higher (lower) risk, family firms are more inclined to diversify risk by establishing an IJV in a country with high (low) institutional protection.

Finally, as shown in Columns (5) and (6), when the number of partners in the IJV is the dependent variable the coefficients of the interaction term between *FamilyFirm*1 and *RelatedIJV*

(*FamilyFirm1*RelatedIJV*: b = -0.433, $p < 0.10$) and the interaction between *FamilyFirm*1 and *Institution* (*FamilyFirm1*Institution*: b = -1.055, $p < 0.05$) are negative and significant. Parts (E) and (F) of Figure 1 shows that the negative relationship between *MultiParty* and *RelatedIJV,* and negative association between *MultiParty* and *Institution* are strengthened by family involvement (*FamilyFirm1*). These findings suggest that when engaging in unrelated (related) IJVs or forming IJVs in a country with low (high) institutional protection, family firms seem to be more inclined than their nonfamily peers to diversify risk by involving more (fewer) partners in the IJV.

Table 3.6 presents the results of Hypotheses 2 using the second family firm variable (*FamilyFirm2*). As shown, the results for each set of tests are consistent with the findings discussed above. Figure 2 presents the moderating effect of *FamilyFirm2*, which is also consistent with Figure 1. Therefore, our Hypotheses 2 is supported. In sum, these findings suggest that family firms are more likely than nonfamily counterparts to make decisions that are broadly framed and use risk diversification approaches in managing various IJV decisions[8].

[8] Interestingly, the tendency of lone-founder firms to engage in narrow-framing was in most cases no different from that of nonfamily firms.

Table 3.5 Regression Analyses for Hypotheses 2

VARIABLES	(1) *RelatedIJV*	(2) *RelatedIJV*	(3) *Institution*	(4) *Institution*	(5) *MultiParty*	(6) *MultiParty*
FamilyFirm1	1.621***	0.584***	0.146***	0.092***	0.832***	1.173***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
RelatedIJV			-0.023*		-0.187**	
			(0.099)		(0.049)	
Institution	-0.268					0.178
	(0.168)					(0.431)
MultiParty		-0.195*		0.013		
		(0.062)		(0.485)		
*FamilyFirm1*RelatedIJV*			-0.108***		-0.433*	
			(0.002)		(0.066)	
*FamilyFirm1*Institution*	-2.031***					-1.055**
	(0.000)					(0.046)
*FamilyFirm1*MultiParty*		-0.607**		-0.073*		
		(0.016)		(0.065)		
LoneDum1	0.346	0.398*	0.008	0.017	-0.005	-0.068
	(0.420)	(0.057)	(0.840)	(0.639)	(0.987)	(0.880)
*LoneDum1*RelatedIJV*			0.031		0.227	
			(0.466)		(0.462)	
*LoneDum1*Institution*	0.156					0.212
	(0.803)					(0.740)
*LoneDum1*MultiParty*		0.457		0.030		
		(0.153)		(0.464)		
IJVinvsmills1	-1.231	-1.513**	-0.230**	-0.217*	-0.534	-0.697
	(0.103)	(0.032)	(0.037)	(0.052)	(0.465)	(0.375)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Ind. Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,281	1,439	1,281	1,281	1,439	1,281
Pseudo R^2/ Adj. R^2	0.100	0.094	0.057	0.048	0.090	0.092
F-stat	-	-	3.666	3.403	-	-
Chi^2	151.033	159.535	-	-	1,555.264	1,047.948

Note: This table presents the tests for narrow framing perspective by using *FamilyFirm1*. *RelatedIJV* is equal to one if US parent firm and the joint venture are in related industries, 0 otherwise. *Institution is* an index measuring the host country's institutional environment (Dau, 2013; Berrone et al., 2020), which is composed of 5 components: common law origin, anti-self-dealing index, creditor rights, minority shareholder rights, and judicial efficiency. The composite index is normalized (Berrone et al., 2020). *MultiParty* equals to one if there are more than two partners involved in an international joint venture, zero otherwise. *FamilyFirm1* is set to one if a family holds at least 5% of shares in the firm in prior year, and at least two family members who have served or are currently serving as significant owners, managers, or board directors since the beginning of the sample period to prior year, zero otherwise. *LoneDum1* is equal to one, if the founder holds at least 5% of voting share in prior year, and no other family members serve in the firm since the beginning of the sample period to prior year, 0 otherwise. *LoneDum2* is equal to one, if the founder holds at least 5% of voting share in prior year, and family member serve as CEO and/or Board Chair with no other family members involved in the firm since the beginning of the sample period to prior year, zero otherwise. Controls include *Asset*, *Leverage, MTB*, *Growth*, *Profit, Tangibility*, *TaxStatus*. *AltmanZ*. The definitions for controls are presented in Table 3.1. P-value in parentheses. *, **, *** represent significance at 10%, 5% and 1% levels, respectively.

Table 3.6 Regression Analyses for Hypotheses 2 – Continued

VARIABLES	(1) *RelatedIJV*	(2) *RelatedIJV*	(3) *Institution*	(4) *Institution*	(5) *MultiParty*	(6) *MultiParty*
FamilyFirm2	1.341***	0.860***	0.149***	0.113***	1.028***	1.286***
	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
RelatedIJV			-0.029**		-0.192**	
			(0.028)		(0.032)	
Institution	-0.366**					0.164
	(0.049)					(0.437)
MultiParty		-0.185*		0.014		
		(0.058)		(0.398)		
*FamilyFirm2*RelatedIJV*			-0.083*		-0.676**	
			(0.059)		(0.017)	
*FamilyFirm2*Institution*	-1.262**					-1.271**
	(0.046)					(0.037)
*FamilyFirm2*MultiParty*		-0.826***		-0.111**		
		(0.006)		(0.021)		
LoneDum2	0.625	0.482*	-0.004	-0.001	0.077	-0.303
	(0.353)	(0.080)	(0.952)	(0.988)	(0.829)	(0.636)
*LoneDum2*RelatedIJV*			0.038		0.338	
			(0.555)		(0.399)	
*LoneDum2*Institution*	-0.237					0.714
	(0.808)					(0.442)
*LoneDum2*MultiParty*		0.244		0.052		
		(0.536)		(0.334)		
IJVinvsmills2	-1.254*	-1.512**	-0.232**	-0.215**	-0.453	-0.647
	(0.082)	(0.025)	(0.028)	(0.045)	(0.513)	(0.386)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Ind. Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,281	1,439	1,281	1,281	1,439	1,281
Pseudo R^2/ Adj. R^2	0.096	0.095	0.052	0.049	0.090	0.090
F-stat	-	-	3.354	3.583	-	-
Chi^2	145.811	162.000	-	-	1,805.162	1,107.106

Note: This table shows the tests for narrow framing perspective by using *FamilyFirm2*. *RelatedIJV* is equal to one if US parent firm and the joint venture are in related industries, 0 otherwise. *Institution is* an index measuring the host country's institutional environment (Dau, 2013; Berrone et al., 2020), which is composed of 5 components: common law origin, anti-self-dealing index, creditor rights, minority shareholder rights, and judicial efficiency. The composite index is normalized (Berrone et al., 2020). *MultiParty* equals to one if there are more than two partners involved in an international joint venture, zero otherwise. *FamilyFirm2* is set to one if a family holds at least 5% of shares in the firm in prior year, at least two family members who have served or are currently serving as significant owners, managers, or board directors, and family member serve as CEO or Chairman since the beginning of the sample period to prior year, zero otherwise. *LoneDum1* is equal to one, if the founder holds at least 5% of voting share in prior year, and no other family members serve in the firm since the beginning of the sample period to prior year, 0 otherwise. *LoneDum2* is equal to one, if the founder holds at least 5% of voting share in prior year, and family member serve as CEO and/or Board Chair with no other family members involved in the firm since the beginning of the sample period to prior year, zero otherwise. Controls include *Asset*, *Leverage, MTB*, *Growth*, *Profit, Tangibility*, *TaxStatus*. *AltmanZ*. The definitions for controls are presented in Table 3.1. P-value in parentheses. *, **, *** represent significance at 10%, 5% and 1% levels, respectively.

Figure 3.1 The Moderating Effect of *FamilyFirm1*

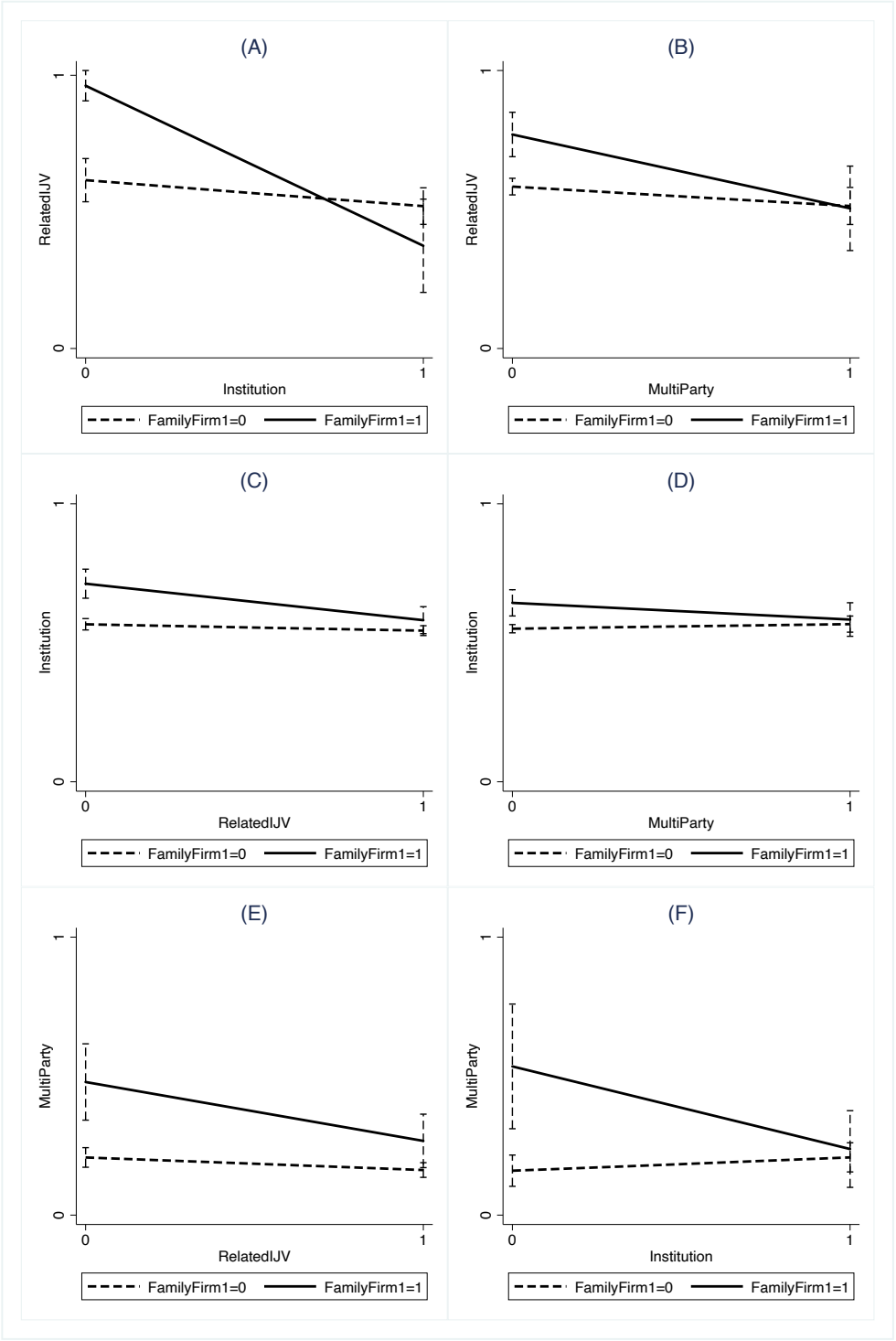
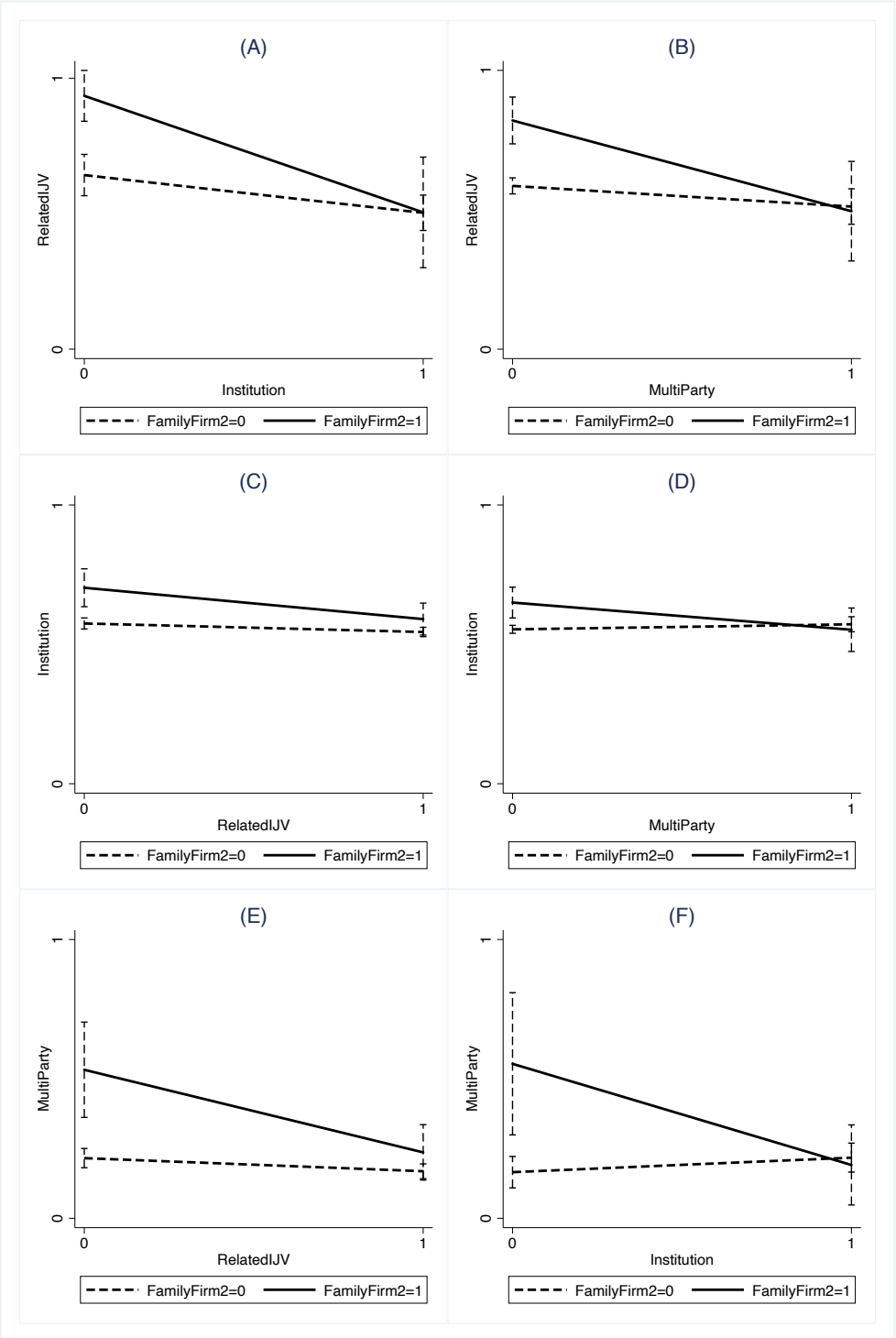


Figure 3.2 The Moderating Effect of *FamilyFirm2*



3.5.2 Robustness and Post-Hoc Tests

To make sure that our results are robust, we carried out additional tests to ensure that our results are robust. We first check the robustness of the results for Hypothesis 2 by including two sets of interactions terms simultaneously in the model. The results are presented in Table 3.7. As shown in Columns (1) and (2) of Table 3.7, we regressed *RelatedIJV* on the interaction between family firm variables and *Institution* as well as family firm variables and *Multiparty*. We repeated this process in Columns (3) and (4) as well as Columns (5) and (6) using *Institution* and *Multiparty* as dependent variables, respectively. The findings remain significant, and consistent with the previous results.

Furthermore, we used an alternative measure of family firm, and check the robustness of the results of Hypothesis 1 and 2. Following previous literature (Faccio & Lang, 2002; Villalonga & Amit, 2006), we define *FamilyFirm3* as a binary variable, which is coded as 1 if a family holds at least 20% of shares in the firm and at least two family members who are currently serving or have served as prominent shareholders, managers, or board members in its history, and 0 otherwise. Table 3.8 reports the results by using the alternative measure. Column (1) of Table 3.8 shows the first stage result of the Heckman (1979)'s two-stage model. We calculate the inverse Mills ratio (IJVinvsmills3) and insert it as a control variable in the second stage. Columns (2) to (4) show the results of Hypothesis 1, in which the coefficients of the family firm variables are consistent with our main results. While Columns (5) to (7) presents the results of Hypothesis 2, the coefficients of the interactions between the family firm variables and the *RelatedIJV*, *Institution*, and *Multiparty* variables remain negative and significant, confirming our main results.

We also conducted tests based on subsamples: family firms (*FamilyFirm1=1*), lone founder firms (*LoneDum1=1*) and other non-family firms. The results in Columns (1) - (3) of Table 3.9 indicates that high *RelatedIJV* is significantly related with low *Institution* and *MultiParty* in the

family firm subsample, while the negative relations are not significant in the lone founder subsample and other firms. Columns (4) - (6) of shows that the coefficients of *RelatedIJV* and *MultiParty* are significant in the family firm subsample, while not significant in the lone founder subsample and other firms. Column (7) - (9) presents that the negative association between *MultiParty* and *RelatedIJV*, and the negative relationship between *MultiParty* and *Institution* are much stronger in family firms than in lone-founder firms and other non-family firms. The results are similar with our main results.

Table 3.7 Robustness Test 1 (with two interaction terms simultaneously included in the model)

VARIABLES	(1) *RelatedIJV*	(2) *RelatedIJV*	(3) *Institution*	(4) *Institution*	(5) *MultiParty*	(6) *MultiParty*
FamilyFirm1	2.375***		0.188***		1.919***	
	(0.000)		(0.000)		(0.000)	
FamilyFirm2		2.338***		0.219***		2.289***
		(0.000)		(0.000)		(0.000)
RelatedIJV			-0.023	-0.029**	-0.175*	-0.165*
			(0.100)	(0.028)	(0.082)	(0.082)
Institution	-0.255	-0.356*			0.158	0.137
	(0.190)	(0.056)			(0.484)	(0.515)
MultiParty	-0.175	-0.144	0.012	0.012		
	(0.111)	(0.160)	(0.512)	(0.447)		
*FamilyFirm1*RelatedIJV*			-0.130***		-0.629**	
			(0.000)		(0.018)	
*FamilyFirm1*Institution*	-2.754***				-1.681***	
	(0.000)				(0.003)	
*FamilyFirm1*MultiParty*	-0.905***		-0.110***			
	(0.001)		(0.004)			
*FamilyFirm2*RelatedIJV*				-0.127***		-0.949***
				(0.005)		(0.003)
*FamilyFirm2*Institution*		-2.218***				-1.951***
		(0.003)				(0.004)
*FamilyFirm2*MultiParty*		-1.229***		-0.159***		
		(0.000)		(0.001)		
LoneDum1	0.264		0.001		-0.245	
	(0.540)		(0.987)		(0.643)	
LoneDum2		0.592		-0.023		-0.554
		(0.380)		(0.750)		(0.444)
*LoneDum1*RelatedIJV*			0.030		0.254	
			(0.494)		(0.444)	
*LoneDum1*Institution*	0.102				0.245	
	(0.872)				(0.700)	
*LoneDum1*MultiParty*	0.450		0.032			
	(0.179)		(0.441)			
*LoneDum2*RelatedIJV*				0.038		0.319
				(0.561)		(0.451)
*LoneDum2*Institution*		-0.252				0.772
		(0.804)				(0.410)
*LoneDum2*MultiParty*		0.123		0.051		
		(0.768)		(0.339)		
IJVinvsmills1	-1.269*		-0.214*		-0.721	
	(0.088)		(0.052)		(0.356)	
IJVinvsmills2		-1.264*		-0.211**		-0.585
		(0.075)		(0.047)		(0.432)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Ind. Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,281	1,281	1,281	1,281	1,281	1,281
Pseudo R^2/ Adj. R^2	0.112	0.108	0.061	0.058	0.102	0.102
F-stat	-	-	3.923	3.815	-	-
Chi^2	167.834	159.920	-	-	1,895.091	1,821.882

Note: This table shows the regression tests for narrow framing perspective by including two interaction terms simultaneously in the model. *RelatedIJV* is equal to one if US parent firm and the joint venture are in related industries, 0 otherwise. *Institution is* an index measuring the host

country's institutional environment (Dau, 2013; Berrone et al., 2020), which is composed of 5 components: common law origin, anti-self-dealing index, creditor rights, minority shareholder rights, and judicial efficiency. The composite index is normalized (Berrone et al., 2020). *MultiParty* equals to one if there are more than two partners involved in an international joint venture, zero otherwise. *FamilyFirm1* is set to one if a family holds at least 5% of shares in the firm in prior year, and at least two family members who have served or are currently serving as significant owners, managers, or board directors since the beginning of the sample period to prior year, zero otherwise. *FamilyFirm2* is set to one if a family holds at least 5% of shares in the firm in prior year, at least two family members who have served or are currently serving as significant owners, managers, or board directors, and family member serve as CEO or Chairman since the beginning of the sample period to prior year, zero otherwise. *LoneDum1* is equal to one, if the founder holds at least 5% of voting share in prior year, and no other family members serve in the firm since the beginning of the sample period to prior year, 0 otherwise. *LoneDum2* is equal to one, if the founder holds at least 5% of voting share in prior year, and family member serve as CEO and/or Board Chair with no other family members involved in the firm since the beginning of the sample period to prior year, zero otherwise. Controls include *Asset*, *Leverage, MTB*, *Growth*, *Profit, Tangibility*, *TaxStatus*. *AltmanZ*. The definitions for controls are presented in Table 3.1. P-value in parentheses. *, **, *** represent significance at 10%, 5% and 1% levels, respectively.

Table 3.8 Robustness Test 2 (with an alternative measure of *Family Business*)

VARIABLES	(1) *IJV*	(2) *RelatedIJV*	(3) *Institution*	(4) *MultiParty*	(5) *RelatedIJV*	(6) *Institution*	(7) *MultiParty*
FamilyFirm3	-0.218**	0.435**	0.064**	0.491***	2.825***	0.217***	1.699***
	(0.048)	(0.019)	(0.022)	(0.007)	(0.000)	(0.000)	(0.004)
RelatedIJV						-0.026**	-0.218**
						(0.050)	(0.023)
Institution					-0.318*		0.083
					(0.092)		(0.698)
MultiParty					-0.230**	0.007	
					(0.027)	(0.664)	
*FamilyFirm3*RelatedIJV*						-0.173***	-0.533
						(0.000)	(0.151)
*FamilyFirm3*Institution*					-3.387***		-1.484**
					(0.001)		(0.037)
*FamilyFirm3*MultiParty*					-0.825**	-0.117**	
					(0.035)	(0.027)	
LoneDum1	-0.065	0.505**	0.024	0.104	0.222	-0.003	-0.342
	(0.652)	(0.011)	(0.461)	(0.582)	(0.604)	(0.948)	(0.513)
*LoneDum1*RelatedIJV*						0.034	0.306
						(0.438)	(0.353)
*LoneDum1*Institution*					0.152		0.335
					(0.810)		(0.594)
*LoneDum1*MultiParty*					0.491	0.036	
					(0.141)	(0.383)	
IJVinvsmills3		-1.419**	-0.227**	-0.463	-1.279*	-0.191*	-0.650
		(0.049)	(0.042)	(0.533)	(0.087)	(0.085)	(0.407)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ind. Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,166	1,439	1,281	1,439	1,281	1,281	1,281
Pseudo R^2/ Adj. R^2	0.040	0.085	0.045	0.077	0.108	0.057	0.092
F-stat	-	-	3.113	-	-	3.613	-
Chi^2	1,844.221	141.383	-	1,742.329	154.912	-	1,869.701

Note: This table shows the robustness check with an alternative measure of Family Business (*FamilyFirm3*). *RelatedIJV* is equal to one if US parent firm and the joint venture are in related industries, 0 otherwise. *Institution is* an index measuring the host country's institutional environment (Dau, 2013; Berrone et al., 2020), which is composed of 5 components: common law origin, anti-self-dealing index, creditor rights, minority shareholder rights, and judicial efficiency. The composite index is normalized (Berrone et al., 2020). *MultiParty* equals to one if there are more than two partners involved in an international joint venture, zero otherwise. *FamilyFirm3* is coded as one if a family holds at least 20% of shares in the firm in prior year, and at least two family members who have served or are currently serving as significant owners, managers, or board directors since the beginning of the sample period to prior year, zero otherwise. *LoneDum1* is equal to one, if the founder holds at least 5% of voting share in prior year, and no other family members serve in the firm since the beginning of the sample period to prior year, 0 otherwise. *LoneDum2* is equal to one, if the founder holds at least 5% of voting share in prior year, and family member serve as CEO and/or Board Chair with no other family members involved in the firm since the beginning of the sample period to prior year, zero otherwise. Controls include *Asset*, *Leverage, MTB*, *Growth*, *Profit, Tangibility*, *TaxStatus*. *AltmanZ*. The definitions for controls are presented in Table 3.1. P-value in parentheses. *, **, *** represent significance at 10%, 5% and 1% levels, respectively.

Table 3.9 Robustness Test 3 (Subsample tests)

VARIABLES	(1) *RelatedIJV* *FamilyFirm*=1	(2) *RelatedIJV* *LoneDum1*=1	(3) *RelatedIJV* Others	(4) *Institution* *FamilyFirm*=1	(5) *Institution* *LoneDum1*=1	(6) *Institution* Others	(7) *MultiParty* *FamilyFirm*=1	(8) *MultiParty* *LoneDum1*=1	(9) *MultiParty* Others
RelatedIJV				-0.181***	-0.061	-0.018	-1.196***	0.274	-0.147
				(0.000)	(0.287)	(0.211)	(0.000)	(0.580)	(0.149)
Institution	-3.848***	-0.965	-0.245				-2.089***	0.593	0.133
	(0.000)	(0.352)	(0.218)				(0.002)	(0.581)	(0.558)
MultiParty	-1.225***	0.190	-0.165	-0.098**	0.003	0.012			
	(0.000)	(0.672)	(0.144)	(0.013)	(0.949)	(0.499)			
IJVinvsmills1	-1.490	-0.731	-2.332**	-0.159	-0.338	-0.126	-0.154	-11.658**	-0.606
	(0.427)	(0.943)	(0.020)	(0.587)	(0.320)	(0.403)	(0.944)	(0.017)	(0.585)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ind. Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	163	108	1,010	163	108	1,010	163	108	1,010
Pseudo R^2/ Adj. R^2	0.374	0.509	0.103	0.103	0.173	0.033	0.305	0.451	0.079
F-stat	-	-	-	-	-	2.045	-	-	-
Chi^2	1,383.562	-	503.140	-	-	-	3,322.758	-	1,252.017

Note: This table shows the robustness check with subsample tests: family subsample, lone founder subsample and other firms. *RelatedIJV* is equal to one if US parent firm and the joint venture are in related industries, 0 otherwise. *Institution is* an index measuring the host country's institutional environment (Dau, 2013; Berrone et al., 2020), which is composed of 5 components: common law origin, anti-self-dealing index, creditor rights, minority shareholder rights, and judicial efficiency. The composite index is normalized (Berrone et al., 2020). *MultiParty* equals to one if there are more than two partners involved in an international joint venture, zero otherwise. *FamilyFirm1* is set to one if a family holds at least 5% of shares in the firm in prior year, and at least two family members who have served or are currently serving as significant owners, managers, or board directors since the beginning of the sample period to prior year, zero otherwise. *LoneDum1* is equal to one, if the founder holds at least 5% of voting share in prior year, and no other family members serve in the firm since the beginning of the sample period to prior year, 0 otherwise. Controls include *Asset*, *Leverage, MTB*, *Growth*, *Profit, Tangibility*, *TaxStatus*. *AltmanZ*. The definitions for controls are presented in Table 3.1. P-value in parentheses. *, **, *** represent significance at 10%, 5% and 1% levels, respectively.

3.6 Discussion and Conclusion

International business scholars highlight the need of taking family ownership into account in IJV research (Nippa and Reuer 2019). In this study, we investigated whether family ownership affects the way firms engage in IJVs by examining three key dimensions of IJV decisions: (1) the type of IJVs pursued (i.e., relatedness); (2) the choice of host country; and (3) number of partners involved in the ventures. Leveraging the narrow-framing perspectives, we theorized and empirically demonstrated how and why family firms behave differently in the context of international joint ventures. We first proposed that compared to nonfamily firms, which do not take the SEW implications of IJV decisions into account, family firms tend to make choices which protect their SEW. As such, family firms are more inclined to 1) prefer related rather than unrelated IJVs; 2) prefer IJVs in countries with high institutional protections; and 3) prefer multi-party IJVs to dyadic ones. In addition, due to the lower likelihood of narrow framing and risk preference, we proposed that family firms are more likely to consider multiple IJV decisions as a group rather than in isolation to diversify risks by grouping low and high risk IJV dimensions. Our results support the hypotheses concerning the preferences of family firms and the propensity to manage the risks associated with the dimensions of IJV decisions analyzed.

It is also worth noting that while family firms seem to differ significantly from nonfamily firms in their strategic choices, lone founder firms do not. This supports the contention of Miller et al. (2007)'s on the distinction between family firms and lone founder firms and provides indirect support for our contention that a major reason family firms make different choices from nonfamily firms is because of the importance of SEW, a motivation that is absent in many lone founder firms.

3.7 Theoretical Implications

This study makes the following contribution to the international business and family business

literatures. First, despite an abundance of research on IJVs and family businesses, these two streams have not yet been systematically integrated (Debellis et al. 2021). While research has been conducted on family firms' propensity to form IJVs (e.g., Abdellatif et al., 2010), scholars have devoted relatively little attention to the distinct characteristics of family firms that may affect the specific manner in which they engage in IJVs. We theorized and showed that family firms' strong emphasis on family-centered non-economic goals (i.e. SEW preservation) leads them to select IJVs with different dimensions than nonfamily firms. To our knowledge, the research presents the first empirical insight on the role of family ownership in firms' choice of IJV type, host country, and number of partners.

In addition, we theorized that the propensity of family firms to broadly rather than narrowly frame IJV dimensions enables them to utilize risk-diversifying strategies when engaging in IJVs. Fang et al. (2021) recently proposed that family firms possess certain unique characteristics (e.g., long-term orientation) that make them less prone to the problem of narrow framing and more likely to embrace risk-diversifying approaches. They found empirical support for this premise by demonstrating that in family firms, the level of risk taken in one decision (for example, R&D investment) is inversely related to the level of risk taken in other decisions (e.g., internationalization). Fang et al. (2021) looked at risky decisions across strategic decisions; whereas we go beyond that by investigating risks coming from different dimensions of a single strategic decision regarding relatedness, institutional context, and number of partners in newly created IJVs. Our findings indicate that the narrow framing tendency is a powerful force in firms' decision-making, fundamentally affecting the way family and nonfamily firms engage in risky activities. In sum, we highlight that family firms' decision-making cannot be fully understood without considering the relationship among a portfolio of risky decisions.

Lastly, we extend family business research by offering unique insights into how family firms

balance socioemotional wealth and financial wealth in undertaking risky activities. Most strategic decisions entail a unique trade-off or "mixed gamble" for family firms as they are presented with the possibility of gains and losses in both financial wealth and SEW. While early research on family firms suggested that family firms are only concerned about preserving SEW losses, recent studies reported that they are also conscious of financial gains such that they attempt to balance SEW losses and gains with financial losses and gains in their strategic decision making (Gomez-Mejia et al., 2010, 2018). Such as, Gomez-Mejia et al. (2010) found that when family firms diversify, they prefer to diversify into related industries rather than unrelated industries as the latter carries a greater risk of both SEW and financial losses. Similar findings were found by Hussinger and Issah (2019), who discovered that when family firms acquire other firms, they prefer to acquire firms that operate in the same industry. Despite making important contributions, these studies do not address the question of how family firms balance SEW and financial returns when they diversify into unrelated industries or acquire firms from unrelated industries. In this research, we show that when family firms do engage in unrelated IJVs that promise greater financial returns with the potential for SEW losses, they make choices in other decision dimensions to mitigate extensive losses of SEW. Thus, our study provides a more nuanced understanding of family firms' approach to balancing SEW and financial returns in undertaking risky activities.

3.8 Limitations and Future Research

There are certain limitations to this study. To begin with, our data reflects the behaviors of public family firms in the U.S. To better understand the strategic preferences of family firms engaged in IJVs, it is necessary to extend our theoretical arguments to non-public firms and firms in other parts of the world given that many family firms are privately held and are located in other countries. Similarly, we used a sample of S&P 1500 firms to test our theoretical predictions. These

are large firms and thus have better access to the resources required to form international joint ventures. Therefore, the generalization of our conclusions to small and medium sized firms remains an open question.

In addition, different kinds of family businesses and various family involvement have been found to have differing impacts on firms' strategic decisions such as corporate venturing (Calabro et al. 2016), foreign direct investment (Liang, Wang, and Cui 2014), and diversification decisions (Schmid et al. 2015). Although our study examines family firms' unique approaches to management and governance, we did not delve into the full scope of heterogeneity among family firms. Future studies are thus needed to examine whether specific differences within family firms (such as the generation in control, private vs. public firms, the emphasis placed on SEW) have different effects on these firms' strategic preferences when engaging in IJVs.

Moreover, our study focuses on three fundamental dimensions of the IJV decision, even though decisions regarding other dimensions may also have an impact. Further research examining other important IJV decisions (e.g., contracting, ownership structures, and management structures among IJV partners) will thus enrich the literature on the role of family ownership on international joint ventures. The scope of our research can also be broadened by testing the extent to which our theoretical predictions apply to other strategic decisions with multiple dimensions such as diversification and firm acquisition. For instance, future studies can identify multiple dimensions of acquisition decisions (e.g., relatedness, size, home country, etc.) that must be considered and examine whether SEW and narrow-framing lead family firms to behave differently from their nonfamily counterparts. Furthermore, research that determines how the approach to broad framing practiced by family firms influences their socioemotional and financial performance is needed.

In conclusion, this study provides important insights into how family firms approach international joint ventures. The study highlight significant differences between family and

nonfamily firms across multiple IJV decisions. Additionally, we emphasis the importance of SEW and the narrow-framing perspective in explaining why family and nonfamily firms have different IJVs tactics. This suggests a number of promising directions for future, which we hope scholars will be inspired to pursue.

CHAPTER 4: ESSAY 3

How does institutional shareholding influence CEO turnover? Through the mechanism of analyst forecast accuracy

Abstract

This study examines the relationship between institutional shareholding and CEO turnover. We find that increased institutional shareholding results in a lower likelihood of CEO turnover directly as well as indirectly (through the mechanism of analyst forecast accuracy). We also investigate the impact of CEO turnover on subsequent firm performance using market-based measures, including firm value and the cost of equity. Moreover, we examine whether different types of CEO turnover would make a difference on firm value and cost of equity. Our results reveal that after CEO turnover—especially when the previous CEO is forced to leave and the successor is from outside the company—the firm value is higher, and the cost of equity is lower.

Keywords: institutional shareholding, CEO turnover, analyst forecast accuracy

4.1 Introduction

Chief executive officer (CEO) turnover is attracting attention from both academia and practitioners. The CEO turnover rate hit a record high in 2019, when 1,640 CEOs left their positions in the U.S. across various sectors from business, government, and NGOs (Challenger, Gray & Christmas, 2019[9]). The apparel, food, technology, and energy sectors have witnessed the largest number of departures. Examples include Brian Dunn at Best Buy, Ray Irani at Occidental Petroleum Corp, and Jeffrey Greenberg at Marsh & McLennan are just a few of the well-known CEOs that have initiated substantial strategic change upon leaving office. Academic interest has been fueled by these and other real-world examples because there are clear practical implications of this activity.

Using a sample of S&P 500 firms between 2003 and 2015, we examine whether institutional shareholding is a significant factor in CEO turnover. Three factors are important here. First, recent research has shown that institutional shareholders are more knowledgeable than individual investors (Nofsinger and Sias 1999; Sias, Starks, and Titman 2001). As a result, institutional shareholding decisions, such as institutional buying and selling, are based on more complete and accurate information about a company's financial performance, and this may increase the likelihood of a CEO replacement. Second, institutional shareholdings are a strong signal of whether investors support incumbent CEOs and their decisions. Third, such institutional shareholding decisions are usually associated with poor stock performance, which is a strong indicator for CEO turnover. We found that CEO turnover is negatively related to the change in the

[9] https://www.cnn.com/2020/01/09/success/ceo-departures-record-high/index.html

number of institutions and to change in the value of institutional shareholding.

Our study also examines the potential channels through which institutional shareholding affects CEO turnover. We propose that there is a negative association between analyst forecast accuracy and the likelihood of CEO turnover. Prior studies have identified a positive relationship between institutional shareholdings and corporate governance quality. For example, the higher the institutional shareholding, the better the company's internal control, including more transparent information on measures like firm value, the debt ratio, cash flow, etc. (Boone and White 2015; Parrino, Sias, and Starks 2003; Borochin and Yang 2017). We argue that analysts can take advantage of this better internal control to provide more accurate forecasts, which will in turn affect the company's decision-making. Once the CEO of the company is found to be ineffective or involved in low-efficiency investments, the CEO is likely to be replaced. Analyst forecasts can also affect a firm's stock performance, and stock price has been shown to be a critical factor that affects the CEO's retention (Brickley 2003; Weisbach 1988). In addition, by bridging the information gap between firms and outside stakeholders, such as distributing research reports to the public, analysts can monitor the business operation so as to inhibit CEOs' misconduct. In this sense, CEOs are less likely to be replaced with accurate analyst forecasts.

A radical strategic change like CEO turnover can have a profound impact on firm performance. Previous studies have demonstrated that CEO turnover may have a positive impact on post- turnover performance for a number of reasons (Dasgupta, Li, and Wang 2014). First, by removing the incumbent CEO, the board of directors sends a very clear message to the successor CEO that poor performance will not be tolerated. Therefore, the new CEO will very likely put in more effort to make a quick overturn (Gao, Harford, and Li 2012). Second, after a CEO is removed, the company will likely search for a candidate who possesses firm-specific knowledge and know-

how to improve firm performance (Ting 2013). It is also necessary to understand how CEO turnover affects future corporate financial performance, because the CEO turnover is thought to be sensitive to poor financial performance, and it is an effective way to measure the effectiveness and efficiency of a corporate governance system. Surprisingly, most studies have assessed the new CEOs performance based solely on accounting measures (Puffer and Weintrop 1991; Murphy and Zimmerman 1993; Gao, Harford, and Li 2017; Defond and Hung 2004). Very few studies have investigated firm value and market response after CEO turnover. Whereas using market-based measures makes more sense when CEO turnover happens, the increasing/falling share prices may directly lead to market value gain/corporate takeover (Lel and Miller 2008). In this study, we find that CEO turnover leads to higher firm value (Tobin Q) and a lower cost of equity.

Different types of CEO turnover may have different impacts on firm performance (Barron, Chulkov, and Waddell 2011; Shen and Cannella 2002). Therefore, we argue that post-turnover performance may vary in different types of CEO turnover scenarios, especially given the mixed findings on choosing internal or external CEO candidates. Our empirical results show that when the previous CEO is forced to leave the company, and the successor is appointed from outside the company, the cost of equity decreases, while Tobin's Q increases.

This study contributes to the literature in several ways. First, it extends the literature on the causes of CEO turnover since prior studies have mainly focused on how firm performance affects CEO turnover. That research has already reached a state of saturation (Brickley 2003). In this study we not only find strong evidence that institutional holdings can directly affect CEO turnover, but also that analyst forecast accuracy may serve as a channel through which institutional shareholding can indirectly affect CEO turnover. Second, surprisingly, given the high frequency of CEO turnover in recent years, the vast majority of studies are still using accounting-based measures to

examine post-turnover firm performance; there is little research using market-based measures. This research contributes to the literature by reporting empirical evidence on the association between CEO turnover and post-turnover firm performance using market-based measures such as firm value and the cost of equity. Third, we intend to reconcile the mixed findings of different types of CEO turnover on post-turnover performance.

This paper is organized as follows. In Section 2, we summarize related literature and propose our research questions. In Section 3, the research design is presented, and in Section 4, our data and empirical results are discussed. Section 5 provides additional analyses and reports the results of robustness tests. Section 6 discusses the implications of our results, and Section 7 concludes.

4.2 Literature and Research Questions

4.2.1 Institutional Shareholding and CEO Turnover

Prior research on the factors that affect CEO turnover primarily examines the influence of corporate performance on CEO turnover. The findings are relatively consistent: poor firm performance leads to CEO turnover (Brickley 2003; Farrell and Whidbee 2003; Jenter and Kanaan 2015). These findings show that CEO turnover is an effective corporate governance practice, and that poorly performed CEOs will be replaced. However, firm performance may not be the single factor leading to CEO turnover despite different measures of firm performance that have been employed in previous studies (Sponholtz 2006). Brickley (2003) pointed out that research regarding the association between corporate performance and CEO turnover has reached a state of saturation; therefore, it is important to search for other determinants of CEO turnover. Parrino et al. (2003) conclude that the number of institutional shareholders and total institutional ownership declined one year before forced CEO turnover.

There are three potential advantages of analyzing the effect of institutional shareholdings on

CEO turnover. First, previous studies have indicated that institutional shareholders are better informed than individual investors (Nofsinger and Sias, 1999; Sias et al., 2001). Therefore, institutional shareholdings (e.g., institutional buying and selling) decisions are made based on more comprehensive and accurate information about firm financial performance, which in turn can have an impact on CEO turnover. Second, we may be able to identify a causal effect of institutional shareholdings on CEO turnover because institutional shareholding is a strong signal of whether investors favor the current top management team (TMT). This decision can largely determine whether the current management will stay or not (Parrino et al., 2003). Third, compared with internal corporate governance practices (which are often rigid and inflexible), institutional shareholdings can profoundly influence top management by directly influencing a company's stock price (Parrino et al., 2003). In this study, we argue that with reduced information asymmetry, the strong signal sent by increasing (or decreasing) institutional shareholdings may lead to less (or more) CEO turnover.

Research Question 1: Does institutional shareholding influence CEO turnover?

4.2.2 Institutional Shareholding, Analyst Forecast Accuracy and CEO Turnover

Although institutional shareholdings have a strong impact on corporate decisions such as CEO replacement, the effectiveness of internal corporate governance actually varies from one company to another. The existing literature argues that institutional shareholdings can improve a firm's internal corporate governance quality. For example, companies with high institutional ownership may have a better information environment and more transparency in terms of factors like cash flow and firm valuation (Boone and White 2015). Previous studies have identified a positive association between the firm's information environment and investment efficiency (Rajkovic 2020). Therefore, we argue that institutional shareholdings may lead to more accurate

analyst forecasts due to less information asymmetry. CEOs are therefore more likely to be removed when they engage in low investment efficiency activities, such as empire building, investing in high-risk projects, and other kinds of self-serving activities (Jensen 1986; Morck, Shleifer, and Vishny 1990).

Analyst forecast accuracy can also directly affect future firm valuations, which can have a significant impact on the critical corporate decision such as CEO turnover (Brickley 2003; Weisbach 1988). In addition, analysts can serve as external governance mechanisms (Chen, Harford, and Lin, 2015; Miller, 2006; Chen, Xie, Zhang, 2017; Merton, 1987). First, analysts serve as "monitoring agent role". In order to make performance forecasts, analysts visit companies and communicate with managers directly, allowing them to directly monitor managers and companies, thereby influencing their decision-making process. Higher forecast accuracy indicates stronger monitoring effects. Second, analysts can serve as "information intermediary role". By distributing research documents and media outlets to the public, analysts can bridge the information gap between firms and outside stakeholders, which can curb managers from engaging in value-destroying activities. Thus, financial analyst coverage is likely to reduce the likelihood of CEO turnover, because their monitoring role and information intermediary role are likely to inhibit managers' misconduct. Taking these ideas together, we propose that institutional shareholdings could have both a direct effect and an indirect effect (through analyst forecast accuracy) on CEO turnover.

Research Question 2: Does analyst forecast accuracy mediate the negative association between institutional holding and CEO turnover?

4.2.3 CEO Turnover and Financial Consequences

Many studies have examined the impact of financial performance on CEO turnover by using

accounting-based measures (Puffer and Weintrop 1991; Murphy and Zimmerman 1993; Gao, Harford, and Li 2017; Defond and Hung 2004). For instance, using operating return on assets (OROA) as a proxy for company performance, Huson, Malatesta, and Parrino (2004) find that poor performance usually leads to CEO turnover, and that the company's performance improves significantly after CEO replacement. In an analysis of the relationship between CEO turnover and corporate performance, Dahya, McConnell, and Travlos (2002) find that higher CEO turnover is associated with a lower three-year average industry-adjusted return on assets (IAROA). Kato et al., (2006) also use ROA as a proxy for firm performance; they argue that CEO turnover is negatively correlated with corporate performance, although the significance of the relationship is modest.

Less is known about how CEO turnover affects future corporate financial performance in terms of market-based measures. This is surprising, given the importance of market-based measures in assessing CEO effectiveness. CEO turnover is a significant transition in the life cycle of a firm since the CEO influences issues such as corporate strategy, financial policy, and corporate culture (Gupta, 1988). Thus, CEO turnover has far-reaching implications for firms.

Following prior studies, we propose that CEO turnover is positively related to post-turnover firm performance. Gao et al. (2012) has shown that CEO pay cuts and forced turnover would make CEOs believe in the strength of the governance because the board has made it very clear that it will take action if poorly performing CEOs cannot meet expectations. The newly appointed CEO who is aware of this will likely expend more effort to improve performance. From the common-sense theory perspective, Ting (2013) provides evidence that CEO turnover leads to better post-action firm performance with the main driver of CEO replacement being the searching for nominees with more experience and expertise in helping the company grow and achieve

shareholder goals. Dasgupta, Li, and Wang (2018) argue that bringing in a new CEO with a strong record of running efficiency is necessary to cope with competition. Thus, we expect firms with replaced CEOs will show significant improvement in their subsequent performance. Specifically, we propose that the CEO turnover leads to higher firm value (Tobin Q) as well as a lower cost of equity.

Research Question 3: What are the financial consequences of CEO turnover?

4.2.4 Different Types of CEO Turnover and Financial Consequences

CEO turnover includes two steps: prior CEO leaving and CEO successor hiring. CEO departure in general can be classified into two types: forced CEO leave and voluntary leave (Parrino et al., 2003). CEO successors can be from both inside and outside. Taken together, when a CEO steps down, there are four possible scenarios: 1) forced leave with inside successor, 2) forced leave with outside successor, 3) voluntary leave with inside successor, and 4) voluntary leave with outside successor.

The extant literature provides strong evidence that forced CEO turnover results in better performance and increased productivity (Dasgupta et al., 2018). It suggests that the main reason for forcing CEOs out is to improve performance, and competition will punish those firms that do not take corrective action. In contrast, there are several reasons for CEO voluntary departure (eg., age, lifestyle preference, higher incentive from another company), and it has significant impact on the types of successors. Parrino (1997) documented when a CEO departs voluntarily, 90 percent of times, insiders are appointed. This study extends the current literature by taking a step further investigating all four possible CEO turnover scenarios at the same time.

Shen and Cannella (2002) show that different types of succession have different impacts on firm performance by using three types of CEO turnover: outsider successor, designated insider

successor, and inside contender. Barron et al. (2011) adopt the same classification and find that the likelihood of discontinued operations varies with the CEO successor type.

It is not surprising that outsiders are favorable CEO candidates because all insiders are more or less connected with the current underperforming CEO. When the incumbent CEO steps down, other top executives often choose to leave as well. In addition, CEO turnover signals that the focal firm has already recognized that there are more experienced and capable professional managers in the external market (Mobbs 2013). According to Fama and Jensen (1983), the external market is an effective mechanism for identifying talented managers who can become credible CEO candidates. Hiring an outsider can also help the board of directors to distance itself from a poorly performing CEO and preserve their own reputation (Raheja 2005).

But it can also be argued that, given their familiarity with the company and the human capital they have accumulated over a long period of time, insiders are more likely to take the job when a CEO is forced to step down. Moreover, it is time consuming to search a successor from outside, which prevents boards from achieving a quick response to poor performance. Several studies (Borokhovich, Parrino, and Trapani, 1996; Huson, Parrino, and Starks, 2001; and Parrino, 1997) have shown that about half of the successors are from inside the firm when a CEO is forced out. Previous studies have also found that insiders who also serve as outside directors are more inclined to succeed a forced CEO transition and are favorably related to improved post-turnover accounting performance (Mobbs, 2013). However, when CEO voluntarily turnover, outside successor may lead to a reduced firm performance due to resistance from senior executives inside the company (Khurana & Nohria 2000). In their paper, they have also shown that forced CEO turnover followed by an inside successor will lead to worse firm performance because like his or her predecessors, they do not have new and diverse perspectives to carry out significant organizational change.

This mixed evidence suggests that the role of the relationship between CEO turnover and post-turnover performance remains both conceptually and empirically underdeveloped. Thus, we intend to address the following:

Research Question 4: How do different types of CEO turnover influence financial consequences?

4.3 Methods

4.3.1 Sample and Data

We examined the foregoing research questions by using data from S&P 500 companies operating in the U.S. between 2003 and 2015. We hand-collected CEO turnover information through the U.S. Stock Exchange Commission (SEC) company filings. We extracted the information on different types of CEO turnover through *The Wall Street Journal.* (e.g., such as whether CEOs are forced to quit or voluntarily resign)[10]. We also included the information about the new CEOs, such as whether the successors were from inside or hired from outside of the company. Institutional holding data is obtained from Thomson/Refinitiv. To calculate the cost of equity and analyst forecast accuracy, we obtained data from I/B/E/S, which provides data on analyst earnings estimates. Other firm-level information is obtained from Compustat. After merging the dataset and eliminating missing values, our final sample consists of 4,587 firm-year observations.

4.3.2 Variables

[10] We have also used multiple mainstream media outlets, such as Forbes, Bloomberg, Time, etc. to verify the information that was obtained from the Wall Street Journal.

4.3.2.1 Dependent variables

CEO turnover (*Turnover*). It is a binary variable that is set at 1 if a CEO leaves the firm in the year t, or 0 otherwise. We examine determinants and mechanisms that could have an effect in explaining CEO turnover, and the consequences that CEO turnover could have on the firms. We also differentiate between voluntary and forced leaves. *ForceLeave* is set to equal one if, (1) the *Wall Street Journal* reports that the CEO is fired, ousted, or forced to leave the company; (2) the *Wall Street Journal* doesn't report the reason as involving death, poor health, or the acceptance of another position, and the departing CEO is under the age of 60; and (3) the *Wall Street Journal* reports that the CEO is retiring, but the announcement date is less than 6 months before the succession, and the departing CEO is under the age of 60 (Parrino 1997; Parrino, Sias, and Starks 2003), and set to equal zero otherwise, which means voluntarily leave. We are also interested in whether the successor is appointed from inside or outside of the company. *Force_Out* is set at one if the departing CEO is forced to leave the company and the successor is appointed from outside the company, zero otherwise. *Force_Ins* is equal to one if the departing CEO is forced to leave the firm and the successor is from inside the firm, zero otherwise. *Vol_Out* is set at one if the departing CEO voluntarily leaves the company and the successor is from outside the company, zero otherwise. *Vol_Ins* is set at one if the departing CEO voluntarily leaves the company and the successor is from inside the company, zero otherwise.

Market evaluation. We followed Younge and Marx (2016) and estimated Tobin's Q using the formula: Tobin's Q = (market value of the firm + book value of total assets – book value of common equity) / book value of total assets).

Cost of equity. We use the ex-ante cost of equity that is implied in stock prices and analysts' earnings forecasts. Following Hail and Leuz (2009), we use the average of the four

estimates by Claus and Thomas (2001), Gebhardt, Lee, and Swaminathan (2001), and Ohlson and Juettner-Nauroth (2005) as implemented by Gode and Mohanram (2003), and the modified PEG model by Easton (2004) as the main proxy.

4.3.2.2 Independent variable

Institutional holdings. The first aspect is the changes in the number of institutions between the end of year t and the end of year t-1. The second is the changes in the percentage of share value held by institutional investors from the end of year t-1 to the end of year t, divided by the number of shareholdings.

4.3.2.3 Mediator

Analyst forecast accuracy (*Accuracy*) is measured as the absolute value of the difference between the average of analysts' earnings per share (EPS) forecast and the actual EPS divided by the fiscal year end price, multiplied by minus one (Cowan and Salotti 2020; Kanagaretnam, Lobo, and Mathieu 2012; Tan, Wang, and Welker 2011). Higher values stand for higher forecast accuracy.

4.3.2.4 Controls

We include several control variables that are likely to be correlated with CEO turnover and other dependent variables. *ROA* is calculated by income before extraordinary items over total assets at the beginning of the year. *Asset* is the natural logarithm of one plus total assets. *SaleGrowth* is the percentage change in annual sales in year t-1. *MTB* (Market-to-Book ratio) is the ratio of the market value to total assets. *Leverage* is the ratio of long-term debt to total assets. *Tangibility* is the sum of net property, plant and equipment and total inventories, scaled by total assets. *Liquidity* proxies for liquidity constraints, is a binary variable, which coded as one if the firm generates negative operating cash flow, and zero otherwise. *RF* is the risk-free rate, measured

by annualized the three-month treasury bill rate. Table 4.1 summarizes the definitions of all variables in Essay 3.

Table 4.1 Variable Definitions

Variables	Definitions	Sources
Turnover	A binary variable that is set at 1 if a CEO leaves the firm in the year t, or 0 otherwise.	SEC
ForceLeave	A binary variable that is set to equal one if, (1) the *Wall Street Journal* reports that the CEO is fired, ousted, or forced to leave the company; (2) the *Wall Street Journal* doesn't report the reason as involving death, poor health, or the acceptance of another position, and the departing CEO is under the age of 60; and (3) the *Wall Street Journal* reports that the CEO is retiring, but the announcement date is less than 6 months before the succession, and the departing CEO is under the age of 60 (Parrino 1997; Parrino, Sias, and Starks 2003), and set to equal zero otherwise, which means voluntarily leave.	*Wall Street Journal*
Force_Out	A dummy variable, is set at one if the departing CEO is forced to leave the company and the successor is appointed from outside the company, zero otherwise.	*SEC, Wall Street Journal*
Force_Ins	A dummy variable, equal to one if the departing CEO voluntarily leaves the company and the successor is hired from outside the company, zero otherwise.	*SEC, Wall Street Journal*
Vol_Out	A dummy variable, is set at one if the departing CEO voluntarily leaves the company and the successor is hired from outside the company, zero otherwise.	*SEC, Wall Street Journal*
Vol_Ins	A dummy variable, is equal to one if the departing CEO voluntarily leaves the company and the successor is appointed from inside the company, zero otherwise.	*SEC, Wall Street Journal*
COE	The average of the four estimates by Claus and Thomas (2001), Gebhardt, Lee, and Swaminathan (2001), and Ohlson and Juettner-Nauroth (2005) as implemented by Gode and Mohanram (2003), and the modified PEG model by Easton (2004).	I/B/E/S

TobinQ	Market evaluation. Tobin's Q = (market value of the firm + book value of total assets – book value of common equity) / book value of total assets).	Compustat
D_NInstitution	The changes in the number of institutions between the end of year t and the end of year t-1.	Thomson/Refinitiv
D_InstHolding	The changes in the percentage of share value held by institutional investors from the end of year t-1 to the end of year t, divided by the number of shareholdings.	Thomson/Refinitiv
Accuracy	The absolute value of the difference between the average of analysts' earnings per share (EPS) forecast and the actual EPS divided by the fiscal year end price, multiplied by minus one (Cowan and Salotti 2020; Kanagaretnam, Lobo, and Mathieu 2012; Tan, Wang, and Welker 2011).	I/B/E/S
ROA	Income before extraordinary items over total assets at the beginning of the year.	Compustat
Asset	The natural logarithm of one plus total assets.	Compustat
SaleGrowth	The percentage change in annual sales in year t-1.	Compustat
MTB	The ratio of the market value to total assets.	Compustat
Leverage	The ratio of long-term debt to total assets.	Compustat
Tangibility	The sum of net property, plant and equipment and total inventories, scaled by total assets.	Compustat
Liquidity	A binary variable, is set equal to one if the firm generates negative operating cash flow, and zero otherwise.	Compustat
RF	The risk-free rate, measured by annualized the three-month treasury bill rate.	Federal Bank of ST. Louis

Note: This table reports the definitions of all the variables used in Essay 3.

4.4 Empirical Results

Table 4.2 presents descriptive statistics for the main variables. We winsorize all continuous variables at 2.5% and 97.5% of the distribution. The average Turnover ratio is 11.402% (523 of our observations had experienced CEO turnover during the sample period). The average cost of equity is 9.950%, consistent with the previous literature (Daske, Gebhardt, and Klein, 2006; Hail and Leuz, 2005; Balakrishnan, Shivakumar, and Taori, 2021). The average Tobin's Q is 1.842. 24.600 institutions have changed on average, and the percentage of share value held by institutional investors change about 2.148% on average. According to Table 4.3, CEO turnover is negatively correlated with changes in the percentage of institutional holding value and analyst forecast accuracy, as well as in the number of institutions.

The estimation for Research Question 1 and 2 are shown in Table 4.4. We present the results for our two measures for institutional holding; one uses the changes in the number of institutions from year t-1 to t, and the other uses the changes in the share value of the institutional holdings. In Columns (1) and (2) of Table 4.4, the coefficients for *D_NInstitution* and *D_InstHolding* are negative and statistically significant at the 5% and 1% level, respectively, suggesting that the possibility of CEO turnover is reduced when the number of institutions increases, or the institutions increase their shareholdings in the company, Columns (3) to (6) show the mediation effects of analyst forecast accuracy. Column (3) shows the effect of changes in the number of institutions on the analyst forecast accuracy. The coefficient of *D_NInstitution* is positive and significant at 1% level, demonstrating that when the number of institutions increases, the analysts provide a more accurate forecast. The result confirms the argument in the literature that institutional shareholdings can improve corporate governance quality and information transparency (Boone and White 2015; Rajkovic, 2020).

Furthermore, we use average industry forecast accuracy (*Accuracy_Ind*) as an instrumental variable to predict *Accuracy_hat1* and introduce it in Column (4). The coefficient of *Accuracy_hat1* is negative and significant at the 1% level, suggesting analyst forecast accuracy is negatively related with CEO turnover. The possible reason is that analyst coverage plays an additional monitoring role for the firm and helps to align the interest between managers and shareholders (Knyazeva, 2007). The Sobel test, Aroian test, and Goodman tests all confirm that the indirect effect through analyst forecast accuracy exists and are all significant at 0.1% levels. Columns (5) and (6) show the results for mediation effects by using changes in the percentage value of institutional holding (*D_InstHolding*); the results are similar to those in Columns (3) and (4).

Table 4.5 reports the relation between the cost of equity and CEO turnover. As shown in Column (1), CEO turnover is negatively associated with the cost of equity, indicating that when there is a CEO succession, the cost of equity decreases, which is consistent with the argument that companies with CEO turnover improved their corporate governance, and therefore, reduced the interest conflict between managers and shareholders so that they can enjoy a lower cost of equity. In Columns (2), (3) and (5), the coefficients of *ForceLeave and Force_Out* are negative and significant at the 1%, 0.1%, and 0.1% level, respectively; while the coefficients of *Force_Ins, Vol_Ins* and *Vol_Out* are not significant. This suggests that when the previous CEO is forced to leave the company and the new CEO is selected from outside the company, the cost of equity is more likely to decrease.

Table 4.6 reports the relation between Tobin's Q and CEO turnover. As shown in Column (1), CEO turnover is positively associated with Tobin's Q, indicating that when there is a CEO succession, Tobin's Q increases. It confirms that CEO turnover improves a company's corporate

governance, thereby increasing its market value. In Columns (2), (3) and (5), the coefficients of *ForceLeave and Force_Out* are negative and significant at the 5%, 1%, and 1% level, respectively, while the coefficients of *Vol_Ins* and *Vol_Out* are not significant. This suggests that when the previous CEO is forced to leave the company and the new CEO is selected from outside the company, the cost of equity is likely to decrease. The findings are supported by the arguments that outside successors are more capable and professional, and that helps the board of directors distance itself from a poorly performing CEO (Mobbs, 2013; Raheja, 2005).

Table 4.2 Summary Statistics

	N	Mean	S. D.	25%	Median	75%
Turnover	4,587	0.114	0.318	0.000	0.000	0.000
ForceLeave	4,587	0.030	0.171	0.000	0.000	0.000
Force_Out	4,587	0.009	0.095	0.000	0.000	0.000
Force_Ins	4,587	0.020	0.142	0.000	0.000	0.000
Vol_Out	4,587	0.018	0.132	0.000	0.000	0.000
Vol_Ins	4,587	0.066	0.248	0.000	0.000	0.000
COE	4,197	0.099	0.040	0.078	0.091	0.108
TobinQ	4,587	0.999	0.289	0.770	0.942	1.167
D_NInstitution	4,587	24.600	52.953	0.000	15.000	55.000
D_InstHolding	4,587	0.021	0.239	-0.035	0.024	0.157
Accuracy	4,587	-0.009	0.020	-0.007	-0.003	-0.001
ROA	4,587	0.111	0.078	0.057	0.101	0.158
Asset	4,587	9.339	1.145	8.419	9.411	10.402
SaleGrowth	4,587	0.082	0.147	0.015	0.060	0.117
MTB	4,587	3.272	3.824	1.638	2.583	4.041
Leverage	4,587	0.240	0.166	0.123	0.221	0.329
Tangibility	4,587	0.343	0.243	0.137	0.306	0.516
Liquidity	4,587	0.042	0.200	0.000	0.000	0.000
RF	4,587	1.485	1.623	0.070	0.880	2.330

Note: This table shows the summary statistics for all variables in Essay 3. *Turnover* is set at 1 if a CEO leaves the firm in the year t, or 0 otherwise. *ForceLeave* is set to equal one if the CEO is recognized as forced to leave the company, zero otherwise. *Force_Out* is set at one if the departing CEO is forced to leave the company and the successor is appointed from outside the company, zero otherwise. *Force_Ins* is equal to one if the departing CEO voluntarily leaves the company and the successor is hired from outside the company, zero otherwise. *Vol_Out* is set at one if the departing CEO voluntarily leaves the company and the successor is hired from outside the company, zero otherwise. *Vol_Ins* is equal to one if the departing CEO voluntarily leaves the company and the successor is appointed from inside the company, zero otherwise. *TobinQ* is measured as (market value of the firm + book value of total assets – book value of common equity) / book value of total assets). *COE* is the average of the four estimates by Claus and Thomas (2001), Gebhardt, Lee, and Swaminathan (2001), and Ohlson and Juettner-Nauroth (2005) as implemented by Gode and Mohanram (2003), and the modified PEG model by Easton (2004). *D_NInstitution* is the changes in the number of institutions between the end of year t and the end of year t-1. *D_InstHolding* is the changes in the percentage of share value held by institutional investors from the end of year t-1 to the end of year t, divided by the number of shareholdings. *Accuracy* is the absolute value of the difference between the average of an analyst's earnings per share (EPS) forecast and the actual EPS divided by the fiscal year end price, multiplied by minus one (Cowan and Salotti 2020; Kanagaretnam, Lobo, and Mathieu 2012; Tan, Wang, and Welker 2011). *ROA* is the ratio of income before extraordinary items over total assets at the beginning of the year. *Asset* is the natural logarithm of one plus total assets. *SaleGrowth* is the percentage change in annual sales in year t-1. *MTB* is the ratio of the market value to total assets. *Leverage* is the ratio of long-term debt to total assets. *Tangibility* is the sum of net property, plant and equipment and total inventories, scaled by total assets. *Liquidity* is set to one if the firm generates negative operating cash flow, and zero otherwise. *RF* is the risk-free rate, measured by annualized the three-month treasury bill rate.

Table 4.3 Pearson Correlations

Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
(1) Turnover	1.000								
(2) ForceLeave	0.493***	1.000							
(3) Force_Out	0.268***	0.544***	1.000						
(4) Force_Ins	0.403***	0.818***	-0.014	1.000					
(5) Vol_Out	0.374***	-0.024*	-0.013	-0.019	1.000				
(6) Vol_Ins	0.741***	-0.047***	-0.026*	-0.038***	-0.036**	1.000			
(7) COE1	0.048***	0.033**	0.043***	0.012	0.022	0.027*	1.000		
(8) TobinQ1	-0.025*	-0.005	-0.004	-0.005	-0.002	-0.027*	-0.323***	1.000	
(9) D_NInstitution	-0.026*	-0.030**	-0.042***	-0.006	-0.053***	0.016	-0.122***	0.134***	1.000
(10) D_InstHolding	-0.026*	-0.044***	-0.036**	-0.031**	-0.019	0.008	-0.057***	0.078***	0.554***
(11) Accuracy	-0.070***	-0.056***	-0.076***	-0.014	-0.073***	-0.013	-0.530***	0.236***	0.197***
(12) ROA	-0.025*	-0.020	-0.032**	-0.004	-0.023	-0.006	-0.188***	0.564***	0.158***
(13) Asset	0.003	-0.007	-0.002	-0.012	-0.041***	0.030**	0.092***	-0.340***	0.183***
(14) SaleGrowth	-0.022	-0.021	0.000	-0.023	-0.035**	0.005	0.009	0.041***	0.099***
(15) MTB	-0.002	0.000	-0.019	0.013	-0.028*	0.012	-0.111***	0.383***	0.135***
(16) Leverage	0.016	0.030**	0.036**	0.006	0.006	-0.003	0.158***	-0.153***	-0.056***
(17) Tangibility	-0.013	-0.023	-0.042***	0.005	-0.019	0.009	0.018	-0.084***	0.039***
(18) Liquidity	0.028*	0.065***	0.048***	0.047***	0.005	-0.012	0.087***	-0.100***	-0.069***
(19) RF	0.002	0.001	0.019	-0.011	-0.006	0.005	0.117***	-0.057***	-0.042***

Variables	*(10)*	*(11)*	*(12)*	*(13)*	*(14)*	*(15)*	*(16)*	*(17)*	*(18)*	*(19)*
(10) D_InstHolding	1.000									
(11) Accuracy	0.180***	1.000								
(12) ROA	0.033**	0.312***	1.000							
(13) Asset	0.042***	-0.007	-0.182***	1.000						
(14) SaleGrowth	0.027*	0.021	0.120***	0.063***	1.000					
(15) MTB	0.116***	0.181***	0.339***	-0.114***	-0.013	1.000				
(16) Leverage	-0.035**	-0.159***	-0.070***	0.109***	-0.097***	-0.019	1.000			
(17) Tangibility	0.007	-0.012	0.092***	0.015	-0.003	-0.001	0.245***	1.000		
(18) Liquidity	-0.056***	-0.234***	-0.250***	-0.023	-0.021	-0.081***	0.147***	-0.047***	1.000	
(19) RF	-0.041***	-0.079***	0.063***	-0.054***	0.120***	0.021	-0.038**	0.007	0.020	1.000

Note: This table presents Pearson correlations. *Turnover* is set at 1 if a CEO leaves the firm in the year t, or 0 otherwise. *ForceLeave* is set to equal one if the CEO is recognized as forced to leave the company, zero otherwise. *Force_Out* is set at one if the departing CEO is forced to leave the company and the successor is appointed from outside the company, zero otherwise. *Force_Ins* is equal to one if the departing CEO voluntarily leaves the company and the successor is hired from outside the company, zero otherwise. *Vol_Out* is set at one if the departing CEO voluntarily leaves the company and the successor is hired from outside the company, zero otherwise. *Vol_Ins* is equal to one if the departing CEO voluntarily leaves the company and the successor is appointed from inside the company, zero otherwise. *TobinQ* is measured as (market value of the firm + book value of total assets – book value of common equity) / book value of total assets). *COE* is the average of the four estimates by Claus and Thomas (2001), Gebhardt, Lee, and Swaminathan (2001), and Ohlson and Juettner-Nauroth (2005) as implemented by Gode and Mohanram (2003), and the modified PEG model by Easton (2004). *D_NInstitution* is the changes in the number of institutions between the end of year t and the end of year t-1. *D_InstHolding* is the changes in the percentage of share value held by institutional investors from the end of year t-1 to the end of year t, divided by the number of shareholdings. *Accuracy* is the absolute value of the difference between the average of an analyst's earnings per share (EPS) forecast and the actual EPS divided by the fiscal year end price, multiplied by minus one (Cowan and Salotti 2020; Kanagaretnam, Lobo, and Mathieu 2012; Tan, Wang, and Welker 2011). *ROA* is the ratio of income before extraordinary items over total assets at the beginning of the year. *Asset* is the natural logarithm of one plus total assets. *SaleGrowth* is the percentage change in annual sales in year t-1. *MTB* is the ratio of the market value to total assets. *Leverage* is the ratio of long-term debt to total assets. *Tangibility* is the sum of net property, plant and equipment and total inventories, scaled by total assets. *Liquidity* is set to one if the firm generates negative operating cash flow, and zero otherwise. *RF* is the risk-free rate, measured by annualized the three-month treasury bill rate. *, **, *** represent significance at 10%, 5% and 1% levels, respectively.

Table 4.4 Direct and Indirect Effect of Institutional Holding on CEO Turnover

Variable	(1) *Turnover*	(2) *Turnover*	(3) *Accuracy*	(4) *Turnover*	(5) *Accuracy*	(6) *Turnover*
D_NInstitution	-0.001**		0.000***	-0.000		
	(0.041)		(0.000)	(0.607)		
D_InstHolding		-0.312***			0.008***	-0.062
		(0.004)			(0.000)	(0.667)
Accuracy_hat1				-28.665***		
				(0.003)		
Accuracy_hat2						-28.977***
						(0.004)
ROA	-0.400	-0.510	0.054***	1.205*	0.057***	1.190*
	(0.262)	(0.147)	(0.000)	(0.053)	(0.000)	(0.072)
Asset	0.039*	0.031	-0.000	0.035	0.000	0.031
	(0.080)	(0.165)	(0.948)	(0.122)	(0.898)	(0.176)
SaleGrowth	-0.133	-0.147	-0.002	-0.198	-0.002	-0.202
	(0.453)	(0.405)	(0.555)	(0.260)	(0.616)	(0.250)
MTB	0.001	0.001	0.000***	0.007	0.000***	0.007
	(0.898)	(0.841)	(0.001)	(0.260)	(0.003)	(0.270)
Leverage	0.117	0.130	-0.010***	-0.197	-0.010***	-0.191
	(0.487)	(0.436)	(0.005)	(0.287)	(0.004)	(0.308)
Tangibility	-0.075	-0.088	-0.007**	-0.238*	-0.007**	-0.247*
	(0.523)	(0.452)	(0.039)	(0.076)	(0.046)	(0.064)
Liquidity	0.147	0.135	-0.009***	-0.105	-0.009***	-0.112
	(0.214)	(0.249)	(0.002)	(0.498)	(0.003)	(0.469)
RF	-0.147*	-0.154*	-0.001	-0.176**	-0.001	-0.179**
	(0.080)	(0.069)	(0.244)	(0.037)	(0.312)	(0.035)
Accuracy_Ind			0.026***		0.025***	
			(0.000)		(0.000)	
Constant	-1.276***	-1.232***	-0.007	-1.472***	-0.008	-1.444***
	(0.000)	(0.000)	(0.187)	(0.000)	(0.171)	(0.000)
Ind. Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	yes	yes	yes	yes	yes	yes
Observations	4,587	4,587	4,587	4,587	4,587	4,587
R^2	-	-	0.098	-	0.107	
Chi^2	42.89**	43.66**	224.41***	49.05**	236.61***	49.57**
Number of GVKEY	444	444	444	444	444	444

Note: This table presents direct and indirect effect of institutional holding on CEO Turnover. I used panel regression. *Turnover* is set at 1 if a CEO leaves the firm in the year t, or 0 otherwise. *D_NInstitution* is the changes in the number of institutions between the end of year t and the end of year t-1. *D_InstHolding* is the changes in the percentage of share value held by institutional investors from the end of year t-1 to the end of year t, divided by the number of shareholdings. *Accuracy* is the absolute value of the difference between the average of an analyst's earnings per share (EPS) forecast and the actual EPS divided by the fiscal year end price, multiplied by minus one (Cowan and Salotti 2020; Kanagaretnam, Lobo, and Mathieu 2012; Tan, Wang, and Welker 2011). *Accuracy_hat1* is the predicted *Accuracy* from regressions in Column (3). *Accuracy_hat2* is the predicted *Accuracy* from regressions in Column (5). *ROA* is the ratio of income before extraordinary items over total assets at the beginning of the year. *Asset* is the natural logarithm of one plus total assets. *SaleGrowth* is the percentage change in annual sales in year t-1. *MTB* is the ratio of the market value to total assets. *Leverage* is the ratio of long-term debt to total assets. *Tangibility* is the sum of net property, plant and equipment and total inventories, scaled by total assets. *Liquidity* is set to one if the firm generates negative operating cash flow, and zero otherwise. *RF* is the risk-free rate, measured by annualized the three-month treasury bill rate. P-value in parentheses. *, **, *** represent significance at 10%, 5% and 1% levels, respectively.

Table 4.5 CEO Turnover and Cost of Equity

Variable	(1) *COE*	(2) *COE*	(3) *COE*	(4) *COE*	(5) *COE*	(6) *COE*	(7) *COE*
Turnover	-0.002*						
	(0.063)						
ForceLeave		-0.009***					
		(0.004)					
Force_Ins			-0.001	-0.000			
			(0.795)	(0.868)			
Force_Out			-0.036***		-0.036***		
			(0.000)		(0.000)		
Vol_Out			0.003			0.003	
			(0.412)			(0.380)	
Vol_Ins			-0.001				-0.000
			(0.688)				(0.762)
ROA	-0.001	-0.001	-0.001	-0.000	-0.001	-0.000	-0.000
	(0.937)	(0.939)	(0.959)	(0.982)	(0.960)	(0.982)	(0.981)
Asset	0.007***	0.007***	0.007***	0.007***	0.007***	0.007***	0.007***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
SaleGrowth	0.004	0.004	0.004	0.005	0.004	0.005	0.005
	(0.805)	(0.811)	(0.833)	(0.798)	(0.826)	(0.801)	(0.799)
MTB	0.000	0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.996)	(0.995)	(0.882)	(0.985)	(0.878)	(0.974)	(0.986)
Leverage	0.017**	0.017**	0.018**	0.017**	0.018**	0.017**	0.017**
	(0.019)	(0.016)	(0.014)	(0.018)	(0.014)	(0.017)	(0.018)
Tangibility	0.002	0.002	0.002	0.003	0.002	0.002	0.003
	(0.763)	(0.761)	(0.829)	(0.750)	(0.829)	(0.753)	(0.752)
Liquidity	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	(0.242)	(0.249)	(0.224)	(0.240)	(0.226)	(0.235)	(0.240)
RF	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
	(0.428)	(0.416)	(0.469)	(0.433)	(0.470)	(0.433)	(0.435)
Constant	0.024	0.024	0.022	0.023	0.022	0.023	0.023
	(0.232)	(0.240)	(0.280)	(0.246)	(0.280)	(0.242)	(0.246)
Ind. Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	yes	yes	yes	yes	yes	yes	yes
Observations	3,836	3,836	3,836	3,836	3,836	3,836	3,836
R^2	0.191	0.194	0.204	0.190	0.204	0.190	0.190
Number of GVKEY	431	431	431	431	431	431	431

Note: This table presents the influences of CEO turnover on cost of equity. *Turnover* is set at 1 if a CEO leaves the firm in the year t, or 0 otherwise. *ForceLeave* is set to equal one if the CEO is recognized as forced to leave the company, zero otherwise. *Force_Out* is set at one if the departing CEO is forced to leave the company and the successor is appointed from outside the company, zero otherwise. *Force_Ins* is equal to one if the departing CEO voluntarily leaves the company and the successor is hired from outside the company, zero otherwise. *Vol_Out* is set at one if the departing CEO voluntarily leaves the company and the successor is hired from outside the company, zero otherwise. *Vol_Ins* is equal to one if the departing CEO voluntarily leaves the company and the successor is appointed from inside the company, zero otherwise. *COE* is the average of the four estimates by Claus and Thomas (2001), Gebhardt, Lee, and Swaminathan (2001), and Ohlson and Juettner-Nauroth (2005) as implemented by Gode and Mohanram (2003), and the modified PEG model by Easton (2004). *ROA* is the ratio of income before extraordinary items over total assets at the beginning of the year. *Asset* is the natural logarithm of one plus total assets. *SaleGrowth* is the percentage change in annual sales in year t-1. *MTB* is the ratio of the market value to total assets. *Leverage* is the ratio of long-term debt to total assets. *Tangibility* is the sum of net property, plant and equipment and total inventories, scaled by total assets. *Liquidity* is set to one if the firm generates negative operating cash flow, and zero otherwise. *RF* is the risk-free rate, measured by annualized the three-month treasury bill rate. P-value in parentheses. *, **, *** represent significance at 10%, 5% and 1% levels, respectively.

Table 4.6 CEO Turnover and Tobin's Q

Variable	(1) *TobinQ*	(2) *TobinQ*	(3) *TobinQ*	(4) *TobinQ*	(5) *TobinQ*	(6) *TobinQ*	(7) *TobinQ*
Turnover	0.031**						
	(0.019)						
ForceLeave		0.095**					
		(0.027)					
Force_Ins			-0.024*	-0.028**			
			(0.071)	(0.032)			
Force_Out			0.381***		0.380***		
			(0.003)		(0.003)		
Vol_Out			-0.002			-0.005	
			(0.926)			(0.801)	
Vol_Ins			0.013				0.010
			(0.206)				(0.336)
ROA	0.884***	0.906***	0.926***	0.863***	0.926***	0.866***	0.869***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Asset	-0.068***	-0.066***	-0.066***	-0.069***	-0.066***	-0.069***	-0.068***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SaleGrowth	-0.021	-0.021	-0.011	-0.022	-0.012	-0.022	-0.022
	(0.639)	(0.626)	(0.786)	(0.622)	(0.769)	(0.618)	(0.623)
MTB	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Leverage	0.037	0.029	0.020	0.039	0.019	0.039	0.039
	(0.493)	(0.586)	(0.712)	(0.468)	(0.722)	(0.475)	(0.475)
Tangibility	-0.095**	-0.093**	-0.083*	-0.096**	-0.084**	-0.096**	-0.096**
	(0.030)	(0.030)	(0.050)	(0.028)	(0.049)	(0.027)	(0.027)
Liquidity	0.013	0.014	0.016	0.013	0.017	0.013	0.013
	(0.487)	(0.449)	(0.337)	(0.461)	(0.329)	(0.467)	(0.479)
RF	0.009	0.010	0.008	0.009	0.008	0.009	0.009
	(0.539)	(0.503)	(0.612)	(0.572)	(0.597)	(0.554)	(0.553)
Constant	1.564***	1.550***	1.549***	1.576***	1.548***	1.575***	1.573***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Ind. Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	yes	yes	yes	yes	yes	yes	yes
Observations	4,175	4,175	4,175	4,175	4,175	4,175	4,175
R^2	0.145	0.147	0.173	0.143	0.173	0.142	0.143
Number of GVKEY	440	440	440	440	440	440	440

Note: This table presents the influences of CEO turnover on Tobin's Q. *Turnover* is set at 1 if a CEO leaves the firm in the year t, or 0 otherwise. *ForceLeave* is set to equal one if the CEO is recognized as forced to leave the company, zero otherwise. *Force_Out* is set at one if the departing CEO is forced to leave the company and the successor is appointed from outside the company, zero otherwise. *Force_Ins* is equal to one if the departing CEO voluntarily leaves the company and the successor is hired from outside the company, zero otherwise. *Vol_Out* is set at one if the departing CEO voluntarily leaves the company and the successor is hired from outside the company, zero otherwise. *Vol_Ins* is equal to one if the departing CEO voluntarily leaves the company and the successor is appointed from inside the company, zero otherwise. *TobinQ* is measured as (market value of the firm + book value of total assets – book value of common equity) / book value of total assets). *ROA* is the ratio of income before extraordinary items over total assets at the beginning of the year. *Asset* is the natural logarithm of one plus total assets. *SaleGrowth* is the percentage change in annual sales in year t-1. *MTB* is the ratio of the market value to total assets. *Leverage* is the ratio of long-term debt to total assets. *Tangibility* is the sum of net property, plant and equipment and total inventories, scaled by total assets. *Liquidity* is set to one if the firm generates negative operating cash flow, and zero otherwise. *RF* is the risk-free rate, measured by annualized the three-month treasury bill rate. P-value in parentheses. *, **, *** represent significance at 10%, 5% and 1% levels, respectively.

4.5 Robustness Check and Additional Tests

We conduct several additional tests to ensure that our results are robust. We first check the robustness of the mediation effect of analyst forecast accuracy by using an alternative measure called *Dispersion*, which is calculated as the standard deviation of analysts' forecasts scaled by prior year-end stock price, then multiplied by negative one (Chen, Xie, Zhang 2017). The results are reported in Table 4.7, and the coefficient of *D_NInstitution* in Column (1) is positive and significant at the 0.1% level. The coefficient for Dispersion_hat1 is negative and significant at the 1% level. The Sobel, Aroian , and Goodman tests all confirm that the indirect effect through analyst forecast dispersion exists and is significant at 0.1%, 0.1% and 0.1% levels, respectively. Columns (3) and (4) show the results for mediation effects by using changes in the percentage value of institutional holding (*D_InstHolding*) and *Dispersion*. The results are consistent with those in Columns (1) and (2).

We also replicate all regressions using Propensity Score Match (PSM), as our results may suffer from selection bias. We matched the CEO turnover sample with a non- CEO turnover sample. We ran a linear probit regression in which the dependent variable is *Turnover*, set at 1 if the previous CEO departs from the firm, and 0 otherwise. We adopted the nearest-neighbor method with a caliper of 0.03 based on firm size, ROA, Liquidity, location, and industry in each year, aiming to match a sample of non-CEO turnover firms that operated in the same Fama-French 10-industry and were similar in other firm characteristics with the CEO turnover firms from the original sample. We get a sample of 1,046, which consists of 523 CEO turnovers and 523 non-CEO turnovers. Table 4.8 shows the results based on the PSM method. The findings are consistent with our main results.

Table 4.7 Alternative Measure of Analyst Forecast Accuracy

Variable	(1) *Dispersion*	(2) *Turnover*	(3) *Dispersion*	(4) *Turnover*
D_NInstitution	0.000***	-0.000		
	(0.000)	(0.848)		
Dispersion_hat1		-38.731***		
		(0.003)		
D_InstHolding			0.008***	0.036
			(0.000)	(0.829)
Dispersion_hat2				-40.028***
				(0.004)
ROA	0.054***	1.742**	0.056***	1.804**
	(0.000)	(0.026)	(0.000)	(0.034)
Asset	-0.001	0.014	-0.001	0.009
	(0.341)	(0.558)	(0.397)	(0.718)
SaleGrowth	-0.002	-0.207	-0.002	-0.209
	(0.557)	(0.239)	(0.628)	(0.234)
MTB	0.000***	0.009	0.000***	0.009
	(0.004)	(0.177)	(0.010)	(0.192)
Leverage	-0.008**	-0.214	-0.008**	-0.213
	(0.012)	(0.255)	(0.011)	(0.266)
Tangibility	-0.011***	-0.448**	-0.011***	-0.464**
	(0.004)	(0.013)	(0.005)	(0.011)
Liquidity	-0.009***	-0.193	-0.009***	-0.205
	(0.001)	(0.274)	(0.001)	(0.247)
RF	-0.001*	-0.201**	-0.001*	-0.202**
	(0.055)	(0.020)	(0.090)	(0.019)
Accuracy_Ind	0.019***		0.018***	
	(0.000)		(0.001)	
Constant	-0.002	-1.320***	-0.002	-1.286***
	(0.798)	(0.000)	(0.789)	(0.000)
Ind. Dummy	Yes	Yes	Yes	Yes
Year Dummy	yes	yes	yes	yes
Observations	4,587	4,587	4,587	4,587
Chi^2	250.54***	49.05**	258.68***	49.57**
Number of GVKEY	444	444	444	444

Note: This table shows the robustness check by using an alternative measure of analyst forecast accuracy (*Dispersion*). *Turnover* is set at 1 if a CEO leaves the firm in the year t, or 0 otherwise. *D_NInstitution* is the changes in the number of institutions between the end of year t and the end of year t-1. *D_InstHolding* is the changes in the percentage of share value held by institutional investors from the end of year t-1 to the end of year t, divided by the number of shareholdings. *Dispersion* is the standard deviation of the analyst's earnings per share (EPS) forecast divided by the fiscal year end price, multiplied by minus one. *Dispersion_hat1* is the predicted *Dispersion* from regressions in Column (1). *Dispersion_hat2* is the predicted *Dispersion* from regressions in Column (3). *ROA* is the ratio of income before extraordinary items over total assets at the beginning of the year. *Asset* is the natural logarithm of one plus total assets. *SaleGrowth* is the percentage change in annual sales in year t-1. *MTB* is the ratio of the market value to total assets. *Leverage* is the ratio of long-term debt to total assets. *Tangibility* is the sum of net property, plant and equipment and total inventories, scaled by total assets. *Liquidity* is set to one if the firm generates negative operating cash flow, and zero otherwise. *RF* is the risk-free rate, measured by annualized the three-month treasury bill rate. P-value in parentheses. *, **, *** represent significance at 10%, 5% and 1% levels, respectively.

Table 4.8 Robustness Tests Based on PSM Sample

Variable	(1) *Turnover*	(2) *Accuracy*	(3) *Turnover*	(5) *COE*	(6) *TobinQ*
D_InstHolding	-0.501***	0.014***	-0.257		
	(0.007)	(0.000)	(0.277)		
Accuracy_hat2			-28.853*		
			(0.089)		
Turnover				-0.006**	0.011**
				(0.018)	(0.032)
ROA	0.096	0.085***	1.793	-0.119***	1.654***
	(0.882)	(0.000)	(0.131)	(0.000)	(0.000)
Asset	-0.067	0.001**	-0.068*	0.001	-0.029***
	(0.102)	(0.045)	(0.096)	(0.395)	(0.001)
SaleGrowth	0.046	-0.009	0.026	0.021	-0.081
	(0.885)	(0.195)	(0.933)	(0.106)	(0.299)
MTB	-0.000	0.000***	0.006	-0.001*	0.014***
	(0.996)	(0.010)	(0.605)	(0.088)	(0.000)
Leverage	0.148	-0.023***	-0.198	0.045***	-0.055
	(0.582)	(0.000)	(0.553)	(0.000)	(0.243)
Tangibility	-0.151	0.001	-0.304	-0.011	-0.035
	(0.499)	(0.851)	(0.201)	(0.124)	(0.311)
Liquidity	-0.211	-0.002	-0.447**	0.003	0.035
	(0.217)	(0.546)	(0.045)	(0.661)	(0.381)
RF	-0.144	0.000	-0.172	-0.004	-0.017
	(0.322)	(0.884)	(0.240)	(0.420)	(0.472)
Accuracy_Ind		0.044***			
		(0.000)			
Constant	0.741	-0.021***	0.540	0.082***	1.120***
	(0.106)	(0.003)	(0.254)	(0.000)	(0.000)
Ind. Dummy	Yes	Yes	Yes	Yes	Yes
Year Dummy	yes	yes	yes	yes	yes
Observations	1,046	1,046	1,046	947	1001
R^2	0.013	0.273	0.022	0.181	0.443

Note: This table shows the robustness check based on PSM sample. *Turnover* is set at 1 if a CEO leaves the firm in the year t, or 0 otherwise. *COE* is the average of the four estimates by Claus and Thomas (2001), Gebhardt, Lee, and Swaminathan (2001), and Ohlson and Juettner-Nauroth (2005) as implemented by Gode and Mohanram (2003), and the modified PEG model by Easton (2004). *TobinQ* is measured as (market value of the firm + book value of total assets – book value of common equity) / book value of total assets). *D_InstHolding* is the changes in the percentage of share value held by institutional investors from the end of year t-1 to the end of year t, divided by the number of shareholdings. *Accuracy* is the absolute value of the difference between the average of an analyst's earnings per share (EPS) forecast and the actual EPS divided by the fiscal year end price, multiplied by minus one (Cowan and Salotti 2020; Kanagaretnam, Lobo, and Mathieu 2012; Tan, Wang, and Welker 2011). *Accuracy_hat2* is the predicted *Accuracy* from regressions in Column (2). *ROA* is the ratio of income before extraordinary items over total assets at the beginning of the year. *Asset* is the natural logarithm of one plus total assets. *SaleGrowth* is the percentage change in annual sales in year t-1. *MTB* is the ratio of the market value to total assets. *Leverage* is the ratio of long-term debt to total assets. *Tangibility* is the sum of net property, plant and equipment and total inventories, scaled by total assets. *Liquidity* is set to one if the firm generates negative operating cash flow, and zero otherwise. *RF* is the risk-free rate, measured by annualized the three-month treasury bill rate. P-value in parentheses. *, **, *** represent significance at 10%, 5% and 1% levels, respectively.

4.6 Discussions

The topic of CEO turnover has sparked a lot of ongoing discussion and debate. Because of its far-reaching impact on firm performance and market value, CEO turnover and its determinants have received most of the interest in the existing research. We investigate CEO turnover using a panel dataset of S&P 500 firms because they are representative in the economy and offer possibilities for gaining new insights into the determinants of CEO turnover and its subsequences. We further investigate that by exploring the differences between family firms and non-family firms, we can learn more about the factors that influence CEO turnover.

We start with the finding that increased institutional shareholding leads to lower possibility of CEO turnover directly as well as indirectly through the mechanism of analyst forecast accuracy. Our evidence suggests that institutional shareholding is a strong predictor of CEO turnover. Institutional shareholders have more complete and accurate information about top management team and firm performance, therefore, their investing decisions can largely determine an incumbent CEO's stay. In addition, consistent with previous literature, institutional shareholders can influence stock price, and poor stock performance is closely related to CEO turnover. So, in this regard, institutional shareholdings can profoundly influence CEO turnover (Parrino et al., 2003; Sias et al., 2001). We have also identified analyst coverage can serve as a channel, through which institutional shareholders can make a significant impact on CEO turnover as well. It proves that institutional shareholdings can trigger more accurate analyst forecasts which will reduce information asymmetry even further, so that incapable CEOs are more likely to be replaced (Jensen, 1986; Morck et al.,1990).

We receive strong support for the positive association between CEO turnover and post-turnover performance using Tobin's Q and negative association between CEO turnover and cost of equity. Different types of CEO turnover would convey different signals to investors, and have

various influences on the subsequent performance (Shen and Cannella 2002; Barron et al., 2011; Connelly, Ketchen, Gangloff and Shook 2013). Prior studies find that CEO dismissal is more likely after poor performance and scandals. The reason is that the board or shareholders attribute the poor performance or scandals to the CEO and consider it is worth replacing the incumbent with a new CEO (Hirshleifer and Thakor 1994, 1998; Mobbs 2013). Our evidence suggests that newly hired CEOs know they will be removed like their predecessors if they cannot meet shareholders' expectation, therefore, they are very likely to show better performance. In addition, newly hired CEOs have already been screened to make sure they are suitable to amid prior CEO's poor performance (Dasgupta et al., 2014; Dasgupta et al., 2018; Gao et al., 2012; Ting, 2013).

Moreover, from a firm's perspective, appointing an outsider could be a necessary break from the past. All insiders are more or less connected with the incumbent CEO. They are familiar with the company's routine and strategies (Zhang and Rajagopalan, 2004), thus, they are less likely or less capable to make changes to the companies' strategies. Besides that, when the prior CEO is fired due to scandal or misconduct, inside candidates are usually considered to be embedded and engaged in a dishonest culture (Rezaee, 2005). Hiring an insider may signal to the public that the company is not serious about changing the misconduct behavior (Zhang and Wiersema, 2009). Therefore, appointing an insider as CEO could hardly turn the poor situation around. On the other hand, outside successors can bring fresh perspectives to the firm, and they are more willing to make strategic changes. Hiring CEO from outside can also show the public the company's determination to reform (Connelly, Ketchen, Gangloff and Shook, 2013; Raheja, 2005). Our findings support that subsequent financial performance and cost of equity improved when incumbent CEO was forced out and an outsider filled the position.

4.7 Conclusions

Combining a sample of S&P 500 firms extracted from multiple sources, we investigated the effect of institutional shareholdings on CEO turnover, and its consequences. Our findings demonstrate that there are both direct and indirect effects of institutional shareholdings on CEO turnover. Both institutional shareholdings and analyst forecasts help to predict such radical change. We find that replacing an incapable CEO does lead to better outcomes, such as boosted market value and a lower cost of equity. The findings in the study not only advance our knowledge of the determinants of CEO turnover, but they also provide nuanced understandings of post-turnover performance using market-based measures. This study also attempted to reconcile the debate on considering inside CEO successors or hiring from the outside.

This study is not without limitations, so it also opens several avenues for future research. First, the data extracted from S&P 500 companies already represents good corporate governance and information transparency. In order to prevent biases caused by the predominance of observations from the U.S., future research should focus on collecting additional data from emerging markets and create matched samples. Second, often times the impact of CEO turnover is enormous, whereas in this study, we only focused on the Tobin's Q and the cost of equity. Therefore, alternative proxies for market value and market response should also be taken into consideration in future studies. Third, this paper presents strong support for the mediator role of analyst forecast accuracy, yet it does not rule out other possible channels through which institutional shareholdings could make an impact on CEO turnover. So how to open this "black box" becomes extremely interesting.

CHAPTER 5: GENERAL CONCLUSION

The goal of this dissertation was to shed light on the area of corporate ownership and corporate finance. The first essay is among the first to investigate the conditions under which the EID could have an impact on the cost of debt. Specifically, the paper provides evidence that family involvement weakens the association between EID and cost of debt. In addition, this study also contributes to the literature on family business by investigating whether the moderating effect of family involvement is different among heterogeneous groups, such as those below and above aspiration level groups. Furthermore, the paper examines the heterogeneous effect of family involvement by comparing the financial and post-financial crisis period, which enriches the literature by discussing the consequence of a financial crisis.

The second essay extends the literature on IJVs and family businesses by studying how the distinct characteristics of family firms affect the way they engage in IJVs. Specifically, I study the role of family ownership in a firm's choice of IJV-related decisions, including the choice of IJV type, the choice of host country, and the number of partners. In addition, the essay theorizes that the propensity of family firms to broadly rather than narrowly frame IJV dimensions enables them to utilize risk-diversifying strategies when engaging in IJVs. The essay goes beyond the literature on narrow framing and family firms' strategic decisions by investigating risks coming from different dimensions of a single strategic decision regarding relatedness, institutional context, and the number of partners in newly created IJVs. Lastly, the essay extends family business research by offering unique insights into how family firms balance SEW and financial wealth in undertaking risky activities. This study shows that when family firms do engage in unrelated IJVs that promise greater financial returns with the potential for SEW losses, they make choices in other decision dimensions to mitigate extensive losses of SEW.

The third essay expands the existing literature regarding the causes of CEO turnover. Prior studies have mainly focused on how firm performance affects CEO turnover, which has already reached a state of saturation (Brickley, 2003). In this study, I not only find strong evidence that institutional holdings can directly affect CEO turnover, but also identify analyst forecast accuracy as a channel through which institutional shareholding can indirectly affect CEO turnover. The vast majority of studies are still using accounting-based measures to examine post-turnover firm performance, while there is little research using market-based measures. This research contributes to current findings by presenting empirical evidence on the association between CEO turnover and post-turnover firm performance using market-based measures such as firm value and the cost of equity. Finally, the paper reconciles the mixed findings of different types of CEO successors on post-turnover performance.

The limitations of this study may offer useful guidelines for future research. To begin with, the data reflects the behaviors of large public U.S. firms, it is necessary to extend the studies to small and medium sized firms, non-public firms and firms from other countries. In addition, the first two essays use binary variables to reflect family involvement. Future research can take the advantage of the continuous measurement of family ownership to shed light on the association between ETD and cost of debt, and on the forming of IJVs. Second, we didn't explore the full scope of heterogeneity among family firms. Future studies are thus needed to examine whether specific differences within family firms (such as the generation in control, private vs. public firms, the emphasis placed on SEW) have different effects on these firms' strategic preferences when engaging in IJVs. Moreover, future studies could examine whether family ownership moderates the relation between EID and number of debt covenants as well as the strictness of terms and conditions in the debt contract, whether family involvement influence other important IJV

decisions (e.g., contracting, ownership structures, and management structures among IJV partners), or whether it impacts firms' diversification and acquisition decisions. Last but not least, future studies can identify the other possible mechanism through which institutional shareholdings could make an impact on CEO turnover.

BIBLIOGRAPHY

Abdellatif, Mahamat, Bruno Amann, and Jacques Jaussaud. 2010. "Family versus Nonfamily Business: A Comparison of International Strategies." *Journal of Family Business Strategy* 1 (2): 108–16.

Alessandri, Todd M, Daniele Cerrato, and Kimberly A Eddleston. 2018. "The Mixed Gamble of Internationalization in Family and Nonfamily Firms: The Moderating Role of Organizational Slack." *Global Strategy Journal* 8 (1): 46–72.

Anderson, Ronald C, and David M Reeb. 2003. "Founding-family Ownership and Firm Performance: Evidence from the S&P 500." JOUR. *The Journal of Finance* 58 (3): 1301–28.

Barron, John M., Dmitriy V. Chulkov, and Glen R. Waddell. 2011. "Top Management Team Turnover, CEO Succession Type, and Strategic Change." *Journal of Business Research* 64 (8): 904–10.

Baxter, Ryan, Jean C Bedard, Rani Hoitash, and Ari Yezegel. 2013. "Enterprise Risk Management Program Quality: Determinants, Value Relevance, and the Financial Crisis." *Contemporary Accounting Research* 30 (4): 1264–95.

Beamish, Paul W, and Ariff Kachra. 2004. "Number of Partners and JV Performance." *Journal of World Business* 39 (2): 107–20.

Beamish, Paul W, and Nathaniel C Lupton. 2016. "Cooperative Strategies in International Business and Management: Reflections on the Past 50 Years and Future Directions." *Journal of World Business* 51 (1): 163–75.

Benartzi, Shlomo, and Richard H Thaler. 1995. "Myopic Loss Aversion and the Equity Premium Puzzle." *The Quarterly Journal of Economics* 110 (1): 73–92.

Berrone, Pascual, Cristina Cruz, and Luis R Gomez-Mejia. 2012. "Socioemotional Wealth in Family Firms: Theoretical Dimensions, Assessment Approaches, and Agenda for Future Research." *Family Business Review* 25 (3): 258–79.

Berrone, Pascual, Patricio Duran, Luis Gómez-Mejía, Pursey PMAR Heugens, Tatiana Kostova, and Marc van Essen. 2020. "Impact of Informal Institutions on the Prevalence, Strategy, and Performance of Family Firms: A Meta-Analysis." *Journal of International Business Studies*, 1–25.

Boisot, Max, and John Child. 1988. "The Iron Law of Fiefs: Bureaucratic Failure and the Problem of Governance in the Chinese Economic Reforms." *Administrative Science Quarterly*, 507–27.

Boone, Audra L, and Joshua T White. 2015. "The Effect of Institutional Ownership on Firm Transparency and Information Production." *Journal of Financial Economics* 117 (3): 508–33.

Borisova, Ginka, Paul Brockman, Jesus M Salas, and Andrey Zagorchev. 2012. "Government Ownership and Corporate Governance: Evidence from the EU." *Journal of Banking & Finance* 36 (11): 2917–34.

Borochin, Paul, and Jie Yang. 2017. "The Effects of Institutional Investor Objectives on Firm Valuation and Governance." *Journal of Financial Economics* 126 (1): 171–99.

Breton-Miller, Isabelle Le, and Danny Miller. 2009. "Agency vs. Stewardship in Public Family Firms: A Social Embeddedness Reconciliation." *Entrepreneurship Theory and Practice* 33 (6): 1169–91.

Brickley, James A. 2003. "Empirical Research on CEO Turnover and Firm-Performance: A

Discussion." *Journal of Accounting and Economics* 36 (1–3): 227–33.
Brouthers, Keith D, and Gary J Bamossy. 1997. "The Role of Key Stakeholders in the International Joint Venture Negotiations: Case Studies from Eastern Europe." *Journal of International Business Studies* 28 (2): 285–308.
Buckley, Peter J, and Mark C Casson. 1998. "Analyzing Foreign Market Entry Strategies: Extending the Internalization Approach." *Journal of International Business Studies* 29 (3): 539–61.
Calabro, Andrea, Tommaso Minola, Giovanna Campopiano, and Thilo Pukall. 2016. "Turning Innovativeness into Domestic and International Corporate Venturing: The Moderating Effect of High Family Ownership and Influence." *European Journal of International Management* 10 (5): 505–33.
Carney, Michael. 2005. "Corporate Governance and Competitive Advantage in Family–Controlled Firms." JOUR. *Entrepreneurship Theory and Practice* 29 (3): 249–65.
Chang, Yi-Chieh, Ming-Sung Kao, Anthony Kuo, and Chih-Fang Chiu. 2012. "How Cultural Distance Influences Entry Mode Choice: The Contingent Role of Host Country's Governance Quality." *Journal of Business Research* 65 (8): 1160–70.
Chrisman, James J, and Pankaj C Patel. 2012. "Variations in R&D Investments of Family and Nonfamily Firms: Behavioral Agency and Myopic Loss Aversion Perspectives." JOUR. *Academy of Management Journal* 55 (4): 976–97.
Chua, Jess H, James J Chrisman, and Pramodita Sharma. 1999. "Defining the Family Business by Behavior." *Entrepreneurship Theory and Practice* 23 (4): 19–39.
Claus, James, and Jacob Thomas. 2001. "Equity Premia as Low as Three Percent? Evidence from Analysts' Earnings Forecasts for Domestic and International Stock Markets." *The Journal of Finance* 56 (5): 1629–66.
Cowan, Arnold R., and Valentina Salotti. 2020. "Anti-Selective Disclosure Regulation and Analyst Forecast Accuracy and Usefulness." *Journal of Corporate Finance* 64 (June): 101669.
Cui, Anna Shaojie, and M V Shyam Kumar. 2012. "Termination of Related and Unrelated Joint Ventures: A Contingency Approach." *Journal of Business Research* 65 (8): 1202–8.
Dahlquist, Magnus, and Göran Robertsson. 2001. "Direct Foreign Ownership, Institutional Investors, and Firm Characteristics." *Journal of Financial Economics* 59 (3): 413–40.
Dahya, Jay, John J McConnell, and Nickolaos G Travlos. 2002. "The Cadbury Committee, Corporate Performance, and Top Management Turnover." *The Journal of Finance* 57 (1): 461–83.
Dasgupta, Sudipto, Xi Li, and Albert Wang. 2014. "Product Market Competition Shocks, Firm Performance, and CEO Turnover." *Firm Performance, and CEO Turnover (November 30, 2014)*.
Dasgupta, Sudipto, Xi Li, and Albert Y. Wang. 2018. "Product Market Competition Shocks, Firm Performance, and Forced CEO Turnover." *Review of Financial Studies* 31 (11): 4188–4231.
Davidson, William H. 1980. "The Location of Foreign Direct Investment Activity: Country Characteristics and Experience Effects." *Journal of International Business Studies* 11 (2): 9–22.
Debellis, Francesco, Alfredo De Massis, Antonio Messeni Petruzzelli, Federico Frattini, and Manlio Del Giudice. 2021. "Strategic Agility and International Joint Ventures: The Willingness-Ability Paradox of Family Firms." *Journal of International Management* 27 (1): 100739.

Defond, Mark L., and Mingyi Hung. 2004. "Investor Protection and Corporate Governance: Evidence from Worldwide CEO Turnover." *Journal of Accounting Research* 42 (2): 269–312.

Desender, Kurt A, Ruth V Aguilera, Rafel Crespi, and Miguel GarcÍa-cestona. 2013. "When Does Ownership Matter? Board Characteristics and Behavior." *Strategic Management Journal* 34 (7): 823–42.

Dezsö, Cristian L, and David Gaddis Ross. 2012. "Does Female Representation in Top Management Improve Firm Performance? A Panel Data Investigation." *Strategic Management Journal* 33 (9): 1072–89.

Easton, Peter D. 2004. "PE Ratios, PEG Ratios, and Estimating the Implied Expected Rate of Return on Equity Capital." *The Accounting Review* 79 (1): 73–95.

Fagre, Nathan, and Louis T Wells. 1982. "Bargaining Power of Multinationals and Host Governments." *Journal of International Business Studies* 13 (2): 9–23.

Fang, Hanqing "Chevy," Esra Memili, James J Chrisman, and Linjia Tang. 2021. "Narrow-framing and Risk Preferences in Family and Non-family Firms." *Journal of Management Studies* 58 (1): 201–35.

Farrell, Kathleen A., and David A. Whidbee. 2003. "Impact of Firm Performance Expectations on CEO Turnover and Replacement Decisions." *Journal of Accounting and Economics* 36 (1-3 SPEC. ISS.): 165–96.

Gao, Huasheng, Jarrad Harford, and Kai Li. 2012. "CEO Pay Cuts and Forced Turnover: Their Causes and Consequences." *Journal of Corporate Finance* 18 (2): 291–310.

———. 2017. "CEO Turnover-Performance Sensitivity in Private Firms." *Journal of Financial and Quantitative Analysis* 52 (2): 583–611.

Garcia-Canal, Esteban, Ana Valdés-Llaneza, and Africa Ariño. 2003. "Effectiveness of Dyadic and Multi-Party Joint Ventures." *Organization Studies* 24 (5): 743–70.

Gebhardt, William R, Charles M C Lee, and Bhaskaran Swaminathan. 2001. "Toward an Implied Cost of Capital." *Journal of Accounting Research* 39 (1): 135–76.

Geringer, J Michael, and Louis Hebert. 1989. "Control and Performance of International Joint Ventures." *Journal of International Business Studies* 20 (2): 235–54.

Gode, Dan, and Partha Mohanram. 2003. "Inferring the Cost of Capital Using the Ohlson–Juettner Model." *Review of Accounting Studies* 8 (4): 399–431.

Goerzen, Anthony. 2007. "Alliance Networks and Firm Performance: The Impact of Repeated Partnerships." *Strategic Management Journal* 28 (5): 487–509.

Gomes-Casseres, Benjamin. 1989. "Joint Ventures in the Face of Global Competition." *Sloan Management Review* 30 (3): 17–26.

Gómez-Mejía, Luis R, Katalin Takács Haynes, Manuel Núñez-Nickel, Kathyrn J L Jacobson, and José Moyano-Fuentes. 2007. "Socioemotional Wealth and Business Risks in Family-Controlled Firms: Evidence from Spanish Olive Oil Mills." JOUR. *Administrative Science Quarterly* 52 (1): 106–37.

Gomez-Mejia, Luis R, Pankaj C Patel, and Thomas M Zellweger. 2018. "In the Horns of the Dilemma: Socioemotional Wealth, Financial Wealth, and Acquisitions in Family Firms." *Journal of Management* 44 (4): 1369–97.

Gomez-Mejia, Luis R, Marianna Makri, and Martin Larraza Kintana. 2010. "Diversification Decisions in Family-controlled Firms." *Journal of Management Studies* 47 (2): 223–52.

Gong, Yaping, Oded Shenkar, Yadong Luo, and Mee-Kau Nyaw. 2007. "Do Multiple Parents Help or Hinder International Joint Venture Performance? The Mediating Roles of Contract Completeness and Partner Cooperation." *Strategic Management Journal* 28 (10): 1021–34.

Graham, John R, Michael L Lemmon, and Jack G Wolf. 2002. "Does Corporate Diversification Destroy Value?" *The Journal of Finance* 57 (2): 695–720.
Griffith, David A, Michael Y Hu, and Haiyang Chen. 1998. "Formation and Performance of Multi-partner Joint Ventures: A Sino-foreign Illustration." *International Marketing Review*.
Gulati, Ranjay, and Lihua Olivia Wang. 2003. "Size of the Pie and Share of the Pie: Implications of Network Embeddedness and Business Relatedness for Value Creation and Value Appropriation in Joint Ventures." In *The Governance of Relations in Markets and Organizations*. Emerald Group Publishing Limited.
Habbershon, Timothy G, and Mary L Williams. 1999. "A Resource-Based Framework for Assessing the Strategic Advantages of Family Firms." *Family Business Review* 12 (1): 1–25.
Hadani, Michael, Maria Goranova, and Raihan Khan. 2011. "Institutional Investors, Shareholder Activism, and Earnings Management." *Journal of Business Research* 64 (12): 1352–60.
Hail, Luzi, and Christian Leuz. 2009. "Cost of Capital Effects and Changes in Growth Expectations around US Cross-Listings." *Journal of Financial Economics* 93 (3): 428–54.
Heckman, James J. 1979. "Sample Selection Bias as a Specification Error." *Econometrica: Journal of the Econometric Society*, 153–61.
Henisz, Witold J. 2000. "The Institutional Environment for Multinational Investment." *The Journal of Law, Economics, and Organization* 16 (2): 334–64.
Hennart, Jean-Francois. 1988. "A Transaction Costs Theory of Equity Joint Ventures." *Strategic Management Journal* 9 (4): 361–74.
Hennart, Jean-François, and Ming Zeng. 2005. "Structural Determinants of Joint Venture Performance." *European Management Review* 2 (2): 105–15.
Hsieh, Linda H Y, Suzana B Rodrigues, and John Child. 2010. "Risk Perception and Post-Formation Governance in International Joint Ventures in Taiwan: The Perspective of the Foreign Partner." *Journal of International Management* 16 (3): 288–303.
Huson, Mark R, Paul H Malatesta, and Robert Parrino. 2004. "Managerial Succession and Firm Performance." *Journal of Financial Economics* 74 (2): 237–75.
Hussinger, Katrin, and Abdul-Basit Issah. 2019. "Firm Acquisitions by Family Firms: A Mixed Gamble Approach." *Family Business Review* 32 (4): 354–77.
Jensen, Michael C. 1986. "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers." *American Economic Review* 76 (2): 323–29.
Jenter, Dirk, and Fadi Kanaan. 2015. "CEO Turnover and Relative Performance Evaluation." *Journal of Finance* 70 (5): 2155–84.
Johanson, Jan, and Jan-Erik Vahlne. 1977. "The Internationalization Process of the Firm—a Model of Knowledge Development and Increasing Foreign Market Commitments." *Journal of International Business Studies* 8 (1): 23–32.
Judson, Ruth A, and Ann L Owen. 1999. "Estimating Dynamic Panel Data Models: A Guide for Macroeconomists." *Economics Letters* 65 (1): 9–15.
Kahneman, Daniel. 2003. "A Perspective on Judgment and Choice: Mapping Bounded Rationality." *American Psychologist* 58 (9): 697.
Kahneman, Daniel, and Dan Lovallo. 1993. "Timid Choices and Bold Forecasts: A Cognitive Perspective on Risk Taking." *Management Science* 39 (1): 17–31.
Kanagaretnam, Kiridaran, Gerald J. Lobo, and Robert Mathieu. 2012. "CEO Stock Options and Analysts' Forecast Accuracy and Bias." *Review of Quantitative Finance and Accounting* 38 (3): 299–322.
Khanna, Tarun, Krishna G Palepu, and Jayant Sinha. 2005. "Strategies That Fit Emerging Markets."

Harvard Business Review 83 (6): 4–19.
Klijn, Elko, Jeffrey J Reuer, Frans A J Van den Bosch, and Henk W Volberda. 2013. "Performance Implications of IJV Boards: A Contingency Perspective." *Journal of Management Studies* 50 (7): 1245–66.
Kogut, Bruce. 1991. "Joint Ventures and the Option to Expand and Acquire." *Management Science* 37 (1): 19–33.
Kogut, Bruce, and Harbir Singh. 1988. "The Effect of National Culture on the Choice of Entry Mode." *Journal of International Business Studies* 19 (3): 411–32.
Kotlar, Josip, Alfredo De Massis, Hanqing Fang, and Federico Frattini. 2014. "Strategic Reference Points in Family Firms." *Small Business Economics* 43 (3): 597–619.
Kronborg, Dorte, and Steen Thomsen. 2009. "Foreign Ownership and Long-term Survival." *Strategic Management Journal* 30 (2): 207–19.
Lel, Ugur, and Darius P. Miller. 2008. "International Cross-Listing, Firm Performance, and Top Management Turnover: A Test of the Bonding Hypothesis." *Journal of Finance* 63 (4): 1897–1937.
Liang, Xiaoya, Lihua Wang, and Zhiyu Cui. 2014. "Chinese Private Firms and Internationalization: Effects of Family Involvement in Management and Family Ownership." *Family Business Review* 27 (2): 126–41.
Lumpkin, G Thomas, Keith H Brigham, and Todd W Moss. 2010. "Long-Term Orientation: Implications for the Entrepreneurial Orientation and Performance of Family Businesses." *Entrepreneurship & Regional Development* 22 (3–4): 241–64.
Lumpkin, G Tom, and Keith H Brigham. 2011. "Long–Term Orientation and Intertemporal Choice in Family Firms." *Entrepreneurship Theory and Practice* 35 (6): 1149–69.
Luo, Xiaowei, Chi-Nien Chung, and Michael Sobczak. 2009. "How Do Corporate Governance Model Differences Affect Foreign Direct Investment in Emerging Economies?" *Journal of International Business Studies* 40 (3): 444–67.
Luo, Yadong. 1997. "Partner Selection and Venturing Success: The Case of Joint Ventures with Firms in the People's Republic of China." *Organization Science* 8 (6): 648–62.
———. 2005. "Transactional Characteristics, Institutional Environment and Joint Venture Contracts." *Journal of International Business Studies* 36 (2): 209–30.
———. 2007. "Are Joint Venture Partners More Opportunistic in a More Volatile Environment?" *Strategic Management Journal* 28 (1): 39–60.
Luo, Yadong, and Seung H Park. 2004. "Multiparty Cooperation and Performance in International Equity Joint Ventures." *Journal of International Business Studies* 35 (2): 142–60.
Makino, Shige, and Paul W Beamish. 1998. "Performance and Survival of Joint Ventures with Non-Conventional Ownership Structures." *Journal of International Business Studies* 29 (4): 797–818.
Makino, Shige, and Daphne Yiu. 2002. "The Choice Between Joint Venture and Wholly Owned Subsidiary: An Institutional Perspective." *Organization Science* 13 (6): 667–83.
Massis, Alfredo De, Federico Frattini, Josip Kotlar, Antonio Messeni Petruzzelli, and Mike Wright. 2016. "Innovation through Tradition: Lessons from Innovative Family Businesses and Directions for Future Research." *Academy of Management Perspectives* 30 (1): 93–116.
Massis, Alfredo De, Federico Frattini, Antonio Majocchi, and Lucia Piscitello. 2018. "Family Firms in the Global Economy: Toward a Deeper Understanding of Internationalization Determinants, Processes, and Outcomes." *Global Strategy Journal* 8 (1): 3–21.
Miller, Danny, and Isabelle Le Breton-Miller. 2006. "Family Governance and Firm Performance:

Agency, Stewardship, and Capabilities." *Family Business Review* 19 (1): 73–87.
Miller, Danny, Isabelle Le Breton-Miller, Richard H Lester, and Albert A Cannella Jr. 2007. "Are Family Firms Really Superior Performers?" *Journal of Corporate Finance* 13 (5): 829–58.
Miller, Danny, and Isabelle Le Breton–Miller. 2014. "Deconstructing Socioemotional Wealth." SAGE Publications Sage CA: Los Angeles, CA.
Mobbs, Shawn. 2013. "CEOs under Fire: The Effects of Competition from inside Directors on Forced CEO Turnover and CEO Compensation." *Journal of Financial and Quantitative Analysis* 48 (3): 669–98.
Morck, Randall, Andrei Shleifer, and Robert W Vishny. 1990. "Do Managerial Objectives Drive Bad Acquisitions?" *The Journal of Finance* 45 (1): 31–48.
Murphy, Kevin J, and Jerold L Zimmerman. 1993. "Financial Performance Surrounding CEO Turnover." *Journal of Accounting and Economics* 16 (1–3): 273–315.
Nippa, Michael, and Jeffrey J. Reuer. 2019. "On the Future of International Joint Venture Research." *Journal of International Business Studies* 50 (4): 555–97.
Nofsinger, John R, and Richard W Sias. 1999. "Herding and Feedback Trading by Institutional and Individual Investors." *The Journal of Finance* 54 (6): 2263–95.
Ohlson, James A, and Beate E Juettner-Nauroth. 2005. "Expected EPS and EPS Growth as Determinantsof Value." *Review of Accounting Studies* 10 (2): 349–65.
Oxley, Joanne E. 1999. "Institutional Environment and the Mechanisms of Governance: The Impact of Intellectual Property Protection on the Structure of Inter-Firm Alliances." *Journal of Economic Behavior & Organization* 38 (3): 283–309.
Park, Jeong-Yang, and Simon Harris. 2014. "Microfoundations for Learning within International Joint Ventures." *International Business Review* 23 (3): 490–503.
Parrino, Robert. 1997. "CEO Turnover and Outside Succession A Succession Analysis." *Journal of Financial Economics* 46 (2): 165–97.
Parrino, Robert, Richard W. Sias, and Laura T. Starks. 2003. "Voting with Their Feet: Institutional Ownership Changes around Forced CEO Turnover." *Journal of Financial Economics* 68 (1): 3–46.
Perkins, Susan, Randall Morck, and Bernard Yeung. 2014. "Innocents Abroad: The Hazards of International Joint Ventures with Pyramidal Group Firms." *Global Strategy Journal* 4 (4): 310–30.
Porta, Rafael. La, Florencio. Lopez-De-Silanes, and Andrei Shleifer. 1999. "Corporate Ownership Around the World." *The Journal of Finance* 54 (2): 471–517.
Puffer, Sheila M, and Joseph B Weintrop. 1991. "Corporate Performance and CEO Turnover: The Role of Performance Expectations." *Administrative Science Quarterly*, 1–19.
Raheja, Charu G. 2005. "Determinants of Board Size and Composition: A Theory of Corporate Boards." *Journal of Financial and Quantitative Analysis* 40 (2): 283–306.
Rajkovic, Tijana. 2020. "Lead Independent Directors and Investment Efficiency." *Journal of Corporate Finance* 64: 101690.
Read, Daniel, and George Loewenstein. 1995. "Diversification Bias: Explaining the Discrepancy in Variety Seeking between Combined and Separated Choices." *Journal of Experimental Psychology: Applied* 1 (1): 34.
Reuer, Jeffrey J. 2000. "Parent Firm Performance across International Joint Venture Life-Cycle Stages." *Journal of International Business Studies* 31 (1): 1–20.
Roy, Jean-Paul, and Christine Oliver. 2009. "International Joint Venture Partner Selection: The Role of the Host-Country Legal Environment." *Journal of International Business Studies* 40

(5): 779–801.
Schmid, Thomas, Markus Ampenberger, Christoph Kaserer, and Ann-Kristin Achleitner. 2015. "Family Firm Heterogeneity and Corporate Policy: Evidence from Diversification Decisions." *Corporate Governance: An International Review* 23 (3): 285–302.
Shen, Wei, and Albert A Cannella Jr. 2002. "Revisiting the Performance Consequences of CEO Succession: The Impacts of Successor Type, Postsuccession Senior Executive Turnover, and Departing CEO Tenure." *Academy of Management Journal* 45 (4): 717–33.
Sias, Richard W, Laura T Starks, and Sheridan Titman. 2001. "The Price Impact of Institutional Trading." SSRN.
Sponholtz, Carina. 2006. "Determinants of CEO Turnover in Public and Private Firms in Denmark-CEO and Firm Characteristics." *Available at SSRN 927424*.
Tan, Hongping, Shiheng Wang, and Michael Welker. 2011. "Analyst Following and Forecast Accuracy after Mandated IFRS Adoptions." *Journal of Accounting Research* 49 (5): 1307–57.
Thaler, Richard. 1985. "Mental Accounting and Consumer Choice." *Marketing Science* 4 (3): 199–214.
Thomsen, Steen, and Torben Pedersen. 2000. "Ownership Structure and Economic Performance in the Largest European Companies." *Strategic Management Journal* 21 (6): 689–705.
Tihanyi, Laszlo, David A Griffith, and Craig J Russell. 2005. "The Effect of Cultural Distance on Entry Mode Choice, International Diversification, and MNE Performance: A Meta-Analysis." *Journal of International Business Studies* 36 (3): 270–83.
Ting, Hsiu I. 2013. "CEO Turnover and Shareholder Wealth: Evidence from CEO Power in Taiwan." *Journal of Business Research* 66 (12): 2466–72.
Villalonga, Belen. 2004. "Diversification Discount or Premium? New Evidence from the Business Information Tracking Series." *The Journal of Finance* 59 (2): 479–506.
Villalonga, Belen, and Raphael Amit. 2006. "How Do Family Ownership, Control and Management Affect Firm Value?" *Journal of Financial Economics* 80 (2): 385–417.
Warfield, Terry D, John J Wild, and Kenneth L Wild. 1995. "Managerial Ownership, Accounting Choices, and Informativeness of Earnings." *Journal of Accounting and Economics* 20 (1): 61–91.
Xia, Jun, Justin Tan, and David Tan. 2008. "Mimetic Entry and Bandwagon Effect: The Rise and Decline of International Equity Joint Venture in China." *Strategic Management Journal* 29 (2): 195–217.
Xu, Kai, Michael A Hitt, and Stewart R Miller. 2020. "The Ownership Structure Contingency in the Sequential International Entry Mode Decision Process: Family Owners and Institutional Investors in Family-Dominant versus Family-Influenced Firms." *Journal of International Business Studies* 51 (2): 151–71.
Zahra, Shaker A. 2005. "Entrepreneurial Risk Taking in Family Firms." *Family Business Review* 18 (1): 23–40.
Zhou, Xianming. 2001. "Understanding the Determinants of Managerial Ownership and the Link between Ownership and Performance: Comment." *Journal of Financial Economics* 62 (3): 559–71.
Zucker, Lynne G. 1987. "Institutional Theories of Organization." *Annual Review of Sociology* 13 (1): 443–64.

Appendix A

A.1 Claus and Thomas (2001)

$$P_t = bv_t + \sum_{\tau=1}^{T} \frac{(\widehat{eps}_{t+\tau} - r_{CT} * bv_{t+\tau-1})}{(1+r_{CT})^{\tau}} + \frac{(\widehat{eps}_{t+T} - r_{CT} * bv_{t+T-1})(1+g_l)}{(r_{CT}-g)(1+r_{CT})^{T}}$$

This is a special application of residual income valuation model. For first five years, we use analysts' forecasts of earnings per share to derive residual income. From T =5, it assumes that residual income will increase at a rate g equal to expected inflation.

A.2 Gebhardt, Lee, and Swaminathan (2001)

$$P_t = bv_t + \sum_{\tau=1}^{T} \frac{(\widehat{eps}_{t+\tau} - r_{GLS} * bv_{t+\tau-1})}{(1+r_{GLS})^{\tau}} + \frac{(\widehat{eps}_{t+T+1} - r_{GLS} * bv_{t+T})}{r_{GLS}(1+r_{GLS})^{T}}$$

This is a special application of residual income valuation model. For first three years, we use analysts' forecasts of earnings per share to derive residual income. From year four to year twelve, it assumes the company's return on equity (ROE) will linearly revert to the industry median ROE. For each industry-year, the median ROE is determined using data from all companies during the previous three years. The classification of the industries is based on Fama and French 48 industries. From T = 12, residual income is expected to remain constant.

A.3 Ohlson and Juettner-Nauroth (2005)

$$P_t = \frac{\hat{d}_{t+1}}{(r_{OJN} - g_l)} + \frac{\widehat{eps}_t(g_s - g_l)}{r_{OJN}(r_{OJN} - g_l)}$$

This is a special application of the abnormal earnings growth valuation model. The model assumes a positive change in forecasted earnings. For the model to produce a numerical result, the expected earnings must increase. The model assumes that the growth in abnormal earnings per share ($g_{l,t}$) beyond year t+1 is equal to the expected rate of inflation.

A.4 Modified price-earnings growth (PEG) ratio model by Easton (2004)

$$P_t = \frac{\left(\widehat{eps}_{t+2} + r_{PEG} * \hat{d}_{t+1} - \widehat{eps}_{t+1}\right)}{r_{PEG}^2}$$

This is a special application of the abnormal earnings growth valuation model. The model assumes that from year three, the abnormal earnings per share remains constant. For the model to produce a numerical solution, it requires that forecasted earnings to increase.

Where,

P_t is the firm's market price of a firm's stock ten months after end of fiscal year t.
bv_t is the book value per share at the end of fiscal year t.

$\widehat{eps}_{t+\tau}$ is the estimated earnings per share for fiscal year $t + \tau$, using either explicit analyst forecasts or derived from analysts' growth forecasts.

$\hat{d}_{t+\tau}$ is the expected net dividends per share for fiscal year $t + \tau$, calculated by

g is the terminal perpetual growth rate. We use the annualized average of monthly inflation rates in prior year as a proxy for g. If g is negative, it is replaced with the median value of inflation during the sample period.

g_s is the estimated short-term growth rate. It is calculated as the average growth rate of the analysts' earnings forecasts in the first two years and analysts' estimated five year growth rate.

g_l is the estimated long-term growth rate. It is computed as the annualized average of monthly inflation rates in prior year as a proxy for g. If g is negative, it is replaced with the median value of inflation during the sample period.

$r_{CT}, r_{GLS}, r_{OJ}, r_{PEG}$ are the implied cost of equity and are derived as the internal rate of return from the above four models.