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Are US family firms subject to agency problems? Evidence from CEO turnover and firm valuation

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Are US Family Firms Subject to Agency Problems? Evidence from CEO Turnover and Firm Valuation*

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Abstract

This paper investigates the impact of the founding family's presence in US public firms on the extent of agency problems related to CEO turnover decisions and on firm valuations after poor performance. In particular, we focus on three types of US public firms: family CEO firms, professional CEO family firms (family firms managed by a hired CEO outside the founding family), and non-family firms. We hypothesize that, the agency problem arising from the expropriation of small shareholders by large shareholders in family CEO firms and the agency problem arising from the separation of ownership and control in non-family firms, lead to a lower CEO turnover-performance sensitivity, compared to professional CEO family firms. Professional CEO family firms are subject to lesser agency problems due to the separation of family ownership and management as well as the founding family's effective monitoring of management. The empirical findings are consistent with our prediction. We further hypothesize and find that the more severe agency problems in both family CEO firms and non-family firms manifest themselves in lower firm value after poor performance, relative to professional CEO family firms. Overall, our results indicate that in the CEO turnover setting, family ownership, when separated from management, can mitigate agency problems as in professional CEO family firm, but when combined with management, can aggravate agency problems as in family CEO firms.

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1. Introduction

Family firms are prevalent in the US economy, representing 33% of S&P 500 and 48% of S&P 1500 firms. As a unique type of public company, a family firm is likely to face different types of agency problems from a non-family firm. On one hand, the founding family's presence can reduce the agency problem arising from the separation of ownership and management due to the family's active involvement in the firm's management and/or monitoring. On the other hand, it can aggravate the agency problem between large and small shareholders. The founding family, being a large and controlling shareholder, may choose to pursue its own interests at the cost of other shareholders. Following prior studies (e.g., Villalonga and Amit, 2006), we refer to these two types of agency problem as *Type I* and *Type II* agency problems, respectively.

While studies focusing on family firms in East Asian economies (e.g., Faccio, Lang, and Young, 2001; Lemmon and Lins 2003) provide consistent evidence that family firms suffer severe Type II agency problems, recent studies on US family firms present a different picture. They show that, relative to non-family firms, US family firms exhibit higher earnings quality (Ali, Chen, and Radhakrishnan, 2007; Wang, 2005), incur lower cost of debt (Anderson, Mansi, and Reeb, 2003), and most importantly, command a valuation premium (Anderson and Reeb, 2003; Villalonga and Amit, 2006). These results seem to suggest that US family firms are subject to lesser agency problems than non-family firms.

Do US family firms indeed suffer lesser agency problems than non-family firms? To better understand the agency problems in US family firms, this paper focuses on one key corporate decision which can help us to identify the potential agency problems in these firms – the CEO retention decision after poor firm performance. As pointed out by Shleifer and Vishny (1997), poorly performing CEOs who resist being replaced might be the costliest manifestation of agency problems. Furthermore, not all family firms are the same with respect to the severity of agency problems. We separate family firms that are run by a member of the founding family, i.e., *family CEO firms*, from those run by a hired professional CEO, i.e., *professional CEO family firms*.

While the alleviation of Type I agency problem is more relevant for professional CEO family firms, the aggravation of Type II agency problem is more relevant for family CEO firms. Thus, we examine the variation of CEO turnover-performance sensitivity across family CEO firms, professional CEO family firms, and non-family firms to evaluate the extent of agency problems in these firms in the CEO turnover setting. As the ultimate manifestation of agency problems is the reduction in firm value, we further investigate how the various agency problems over the CEO turnover decision across these three types of firms systematically affect firm value when the firm has performed poorly.

Since the founding family both owns and manages a family CEO firm, its Type I agency problem is moderate. However, its Type II agency problem could be severe because the founding family might be reluctant to remove its family member from the CEO post when the CEO has performed poorly. In contrast, as management and ownership are separated in non-family firms and professional CEO family firms, their Type I agency problem could be severe although their Type II agency problem is moderate. However, compared to their counterparts in non-family firms, the CEOs in professional CEO family firms are under direct monitoring by the founding family. Given the founding family's knowledge of the business, as well as its incentives to increase firm value due to its concern with family reputation and a lack of diversification in its investment portfolio (Anderson and Reeb, 2003), such monitoring is effective. Hence the Type I agency problem in professional CEO family firms is mitigated. Accordingly, we hypothesize that the CEO turnover-performance sensitivity is lower for both family CEO firms and non-family firms than for professional CEO family firms.

The varying extent of agency problems over the CEO retention decision will ultimately be reflected in firm value. Given poor performance, the more severe the agency problem is, the smaller the probability that poor performance will lead to a CEO turnover, the more (or longer) the firm's performance will suffer, and consequently the lower the firm value will be. Accordingly, we further predict that both family CEO firms and non-family firms are valued

lower than professional CEO family firms when the firm has performed poorly, other things being equal.

Using data from 1,145 firms in the S&P 1500 Index (i.e., S&P 500, S&P MidCap 400, and S&P SmallCap 600 indices) over the period 1996–1999, we find that as predicted, the CEO turnover-performance sensitivity is lower for both family CEO firms and non-family firms than for professional CEO family firms. When stock returns decrease from the top 25th percentile to the bottom 25th percentile, the predicted probability of CEO turnover increases by only 0.1 percentage points for family CEO firms and 3.6 percentage points for non-family firms but by 13.7 percentage points for professional CEO family firms. When we further partition family CEO firms into founder CEO firms and descendant CEO firms, we find that the turnover-performance sensitivity is even lower for descendant CEOs than for founder CEOs. We also find that family CEO firms with high family ownership have an even lower turnover-performance sensitivity than those with low family ownership, and professional CEO family firms with high family ownership have an even higher turnover-performance sensitivity than those with low family ownership, suggesting that the impact of family presence increases with family ownership. Our results are robust to using alternative performance measures, controlling for additional corporate governance variables, and controlling for CEO ownership. We obtain the same inferences when we focus only on forced CEO turnovers.

Following Morck, Shleifer, and Vishny (1988) and Villalonga and Amit (2006), we use Tobin's Q as a proxy for firm value to test valuation differentials across the three types of firms after poor performance. As predicted, we find that after poor performance (i.e., last year's market-adjusted stock returns falling into the bottom quartile of the sample distribution), both family CEO firms and non-family firms are valued at a discount *relative to* professional CEO family firms (Tobin's Q being 0.235 and 0.151 lower), controlling for stock return and other firm characteristics that might affect Tobin's Q. This suggests that the stock market recognizes the difficulty in replacing poorly performing CEOs in the former two types of firms and factors it in

when valuing the firms. Additional analyses indicate that our results are robust to controlling for the potential endogeneity between firm type and firm value and to alternative definition of poor performance.

In addition, while we replicate the well-established family firm valuation premium over non-family firms for the full sample, we find that the family firm premium disappears after poor performance. The disappearance of the family firm premium is apparently driven by family CEO firms, not by professional CEO family firms, which actually enjoy a valuation premium over non-family firms in such a period, as noted above. Furthermore, when we separate founder CEO firms from descendant CEO family firms, we find that even founder CEOs lose their premium while descendant CEOs are associated with a large discount in such a period. These are in sharp contrast to a large founder CEO premium and an insignificant descendant CEO discount in other periods. Thus, agency problems in family CEO firms (both founder CEOs and descendant CEOs) result in a reduction in their firm value.

This paper contributes to the family firm literature by providing insights and evidence on the type and extent of agency problems faced by US family firms. By focusing on the CEO retention decision and firm value after poor performance, we are able to identify the potential agency problem, or the lack of it, in family firms. Both our CEO turnover and valuation results show that, while the founding family's presence effectively lessens the agency problem for professional CEO family firms, it certainly aggravates the agency problem in family CEO firms. While extant studies find that family firms *on average* command a valuation premium over non-family firms, we show that family CEO firms (even founder CEO firms) lose their premium after poor performance when their agency problem is intensified. In contrast, professional CEO family firms command a premium over non-family firms after poor performance, consistent with their reduced agency problem due to effective monitoring by the founding family.

Our paper also contributes to the CEO turnover literature by linking the two types of agency problems to the cross-sectional variation of performance-turnover sensitivity among the

three types of US public firms. Extant studies on CEO turnover generally focus on identifying key determinants of CEO turnover, such as past performance, age, founder status, CEO ownership, industry competition, and risk, without exploring the variation in agency problems across firm types. While we control for all these variables, we show that firm type itself has significant effect on turnover-performance sensitivity over and above founder status and CEO ownership. We find that founding family presence, when combined with family management, lead to lower turnover-performance sensitivity, and when separated from management, leads to higher turnover-performance sensitivity. These results provide new evidence on the role of founding families in CEO turnover decisions.

To our knowledge, this is the first paper that systematically examines the variation in CEO turnover-performance sensitivity and firm valuation after poor performance among family CEO firms, professional CEO family firms, and non-family firms. Our paper is different from studies that examine the succession issue of family firms and its impact on subsequent performance (e.g., Bennedson et al., 2006). First, we compare the agency problems among different types of family firms and non-family firms, rather than focusing on the turnover decision *within* family firms. Second, unlike prior studies that take the CEO turnover decision as given and examine the subsequent firm performance after actual CEO turnover, we investigate the impact of prior performance on the likelihood of CEO turnover. Thus, our tests directly address the agency problem in US family firms that is related to *not* being able to replace poorly performing CEOs.

The rest of the paper is organized as follows. Section 2 provides the literature review and hypothesis development. Section 3 covers data description. Section 4 reports empirical results of CEO turnover analysis, and Section 5 reports empirical results of firm valuation analysis. Conclusions are presented in Section 6.

2. Literature Review and Hypothesis Development

2.1 Literature review

A public company is a nexus of contracting relationships. Unavoidably, there are all sorts of conflicts of interests among its stakeholders. What has been examined the most in academic literature is probably the one between management and shareholders. This conflict arises when managers appropriate the corporate resources for their personal benefits, such as maximizing resources under control and consuming perquisites. Jensen and Meckling (1976) formally model the reduction in firm value caused by this conflict. In this paper, we refer to this conflict as Type I agency problem. Shleifer and Vishny (1997) provide an extensive literature review of studies on the Type I agency problem.

Given the prevalence of Type I agency problem in a public company, the extant literature also investigates the mechanisms that can be used to alleviate it. In addition to the protection from the legal system, SEC, external/internal auditing, and corporate governance, one common measure that shareholders adopt to align managers' interests with shareholders' is to increase managerial ownership (Jensen and Meckling, 1976).[1] Prior empirical evidence provides support for its efficacy. For example, Denis, Denis, and Sarin (1997a) document a negative relation between managerial ownership and diversification, Ang, Cole, and Lin (2000) show that agency costs (excessive expenses and inefficient asset utilization) are inversely related to manager's ownership, and Heitzman (2006) finds a positive relation between equity grants to target CEOs and acquisition premium.

However, while high managerial ownership can alleviate Type I problem, it can potentially lead to Type II agency problem – the conflict of interests between large and small shareholders (Shleifer and Vishny, 1986; La Porta et al., 1999; Gilson and Gordon, 2003). Large shareholders can potentially use their influence in the firm to expropriate small shareholders. Using Tobin's Q

[1] Note that managerial ownership in family CEO firms mainly results from original ownership (for founder CEOs) or inherited ownership (for descendant CEOs), rather than from stock-based compensation.

as a proxy for firm value, Morck, Shleifer, and Vishny (1988) document a nonlinear relation between Tobin's Q and managerial ownership: Tobin's Q increases with managerial ownership when ownership increases from 0% to 5%, but then declines with it when ownership increases from 5% to 25%, consistent with a high level of managerial ownership leading to costly expropriation. (See Holderness (2003) for a literature review of Type II agency problem.)

As noted by Jensen and Meckling (1976), the severity of agency problems varies from firm to firm, depending on the ease with which managers can exercise their own preferences in decision making as opposed to firm value maximization and on the cost of monitoring activities. Recent studies start to explore the variation of agency problems across different types of firms, in particular, US family versus non-family firms. Firm type fundamentally affects a firm's ownership structure, which in turn affects the extent of agency problems. Anderson and Reeb (2003) document that family firms outperform non-family firms across various measures: return on assets, return on equity, and Tobin's Q. Villalonga and Amit (2006) further find that the family firm valuation premium over non-family firms mainly comes from family firms run by founder CEOs.

The aforementioned papers attribute higher firm value in US family firms to their lack of agency problems.[2] With the founding family likely being the largest and controlling shareholder of the company, it is difficult to imagine that family firms are free of agency problems, especially Type II agency problems. In fact, prior research finds evidence that family firms in other economies are subject to agency problems. For example, Faccio, Lang, and Young (2001) focus on dividend policy in East Asian and European family firms and provide evidence of expropriation of other shareholders by the founding family, which is consistent with the Type II agency problem in family firms. Moreover, not all family firms are the same in terms of agency problems. In particular, family CEO firms are more likely to be subject to Type II agency

[2] For example, Anderson and Reeb (2003) argue that the legal protection in US has successfully eliminated Type II agency problem in US family firms.

problems than professional CEO family firms. To provide evidence on agency problems in US family firms and the impact of agency problems on firm value, we focus our study on the CEO retention decision when a CEO has performed poorly and when the conflict of interests among CEO, small and large shareholders is likely intensified. We empirically examine how the two types of agency problems affect CEO retention decisions and ultimately firm valuation across the following three types of firms: family CEO firms, professional CEO family firms, and non-family firms.

We choose to analyze the CEO retention decision for two reasons. First, to determine whether the incumbent CEO is competent for the job is one of the most significant decisions a board of directors has to make. As pointed out by Shleifer and Vishny (1997), poorly performing managers who resist being replaced might be the costliest manifestation of agency problems. Accordingly, agency problems manifested in the CEO turnover context are likely to have a significant impact on firm value. Denis and Denis (1995) and Huson, Malatesta, and Parrino (2004) both find that replacing a poorly performing CEO can improve firm performance and subsequently firm value, and Ertugrul and Krishnan (2007) document that delayed CEO dismissal leads to worse performance and higher incidence of bankruptcy and delisting. Second, CEO turnover provides us with a unique setting in which we can examine the extent of both types of agency problems in family firms, as developed in detail in the next section.

Our analyses are related to both the recently developed literature on US family firms and the CEO turnover literature. Besides the above-mentioned studies on the valuation of family firms, recent studies also examine the impact of family ownership on earnings quality, CEO compensation, and the cost of debt. Ali, Chen, and Radhakrishnan (2007) and Wang (2005) show that earnings quality is higher for family firms than for non-family firms. Chen (2005) reports that the compensation contracts for hired professional CEOs are more sensitive to firm performance in family firms than in non-family firms. Anderson, Mansi, and Reeb (2003) document that family firms incur a lower cost of debt financing than non-family firms. Our paper differs from these

studies along at least two dimensions. First, we investigate both types of agency problems at the same time, while Chen (2005) only focuses on the Type I problem, and other prior studies do not distinguish between the two types of problems. Second, we link agency problems to firm value and identify a circumstance under which agency problems in family CEO firms lead to a reduction in firm value.

Our analysis also complements CEO turnover studies. Prior work on CEO turnover has generally focused on determinants of CEO turnover: past performance (Coughlan and Schmidt, 1985; Warner, Watts, and Wruck, 1988), industry competition (DeFond and Park, 1999; Parrino, 1997), composition of the board of directors (Weisbach, 1988), insider ownership (Denis, Denis, and Sarin, 1997b), and volatility (Dai, 2005). However, there is little research on differences across firm types. In this paper, we take advantage of the variation of agency problems among family CEO firms, professional CEO family firms, and non-family firms and examine how the varying agency problems lead to difference in CEO turnover-performance sensitivity across firm types, beyond the effect of firm and CEO characteristics examined by prior studies.

2.2 Variation of CEO turnover-performance sensitivity across the three types of firms

Following previous family firm studies (Anderson and Reeb, 2003; Villalonga and Amit, 2006), we classify a firm as a family firm if the founders or their descendants hold the top management positions, sit on the board, or are blockholders.[3] To capture the variation in agency problems among family firms, we further separate family firms into those run by family members (founders or descendants) and those run by hired professional CEOs. Thus, we explore the differences in agency problems across the following three types of US public firms:

- *family CEO firms*: family firms with a member of the founding family (founder or descendant) as CEO;

[3] Some might argue that this family firm definition is rather general, and in particular, it does not impose any restrictions on family ownership. If this is the case, it will bias against finding results consistent with our hypotheses. In a robustness check, we reclassify family firms by restricting the family ownership to be at least 1% (or 5%) and we find similar results.

- *professional CEO family firms*: family firms with a hired professional CEO; and
- *non-family firms*: all other public firms.

We now discuss the extent of the agency problems in the CEO turnover setting for each of the three types of firms and the implications for turnover-performance sensitivity and firm valuation. Figure 1 summarizes the agency problems in each type of firms and our predictions.

	Type I agency problem	Type II agency problem	*Turnover-performance sensitivity*	*Firm value (after poor performance)*
Family CEO firms	Moderate	Severe	*Low*	*Low*
Professional CEO family firms	Moderate	Moderate	*High*	*High*
Non-family firms	Severe	Moderate	*Low*	*Low*

Figure 1 Agency problems and empirical predictions

In a family CEO firm, since the founding family holds the CEO position, Type I agency problem should be moderate. However, with considerable influence from the founding family over corporate decisions, Type II agency problem is potentially severe when the family CEO has performed poorly and it becomes an issue whether to replace the incumbent CEO. The founding family may protect the poorly performing family CEO either for the benefit of this particular family member or for some other non-pecuniary reasons, such as maintaining family legacy/name, despite that not replacing the poorly-performing family CEO could potentially hurt firm value and reduce the family's wealth. Indeed, holding important executive positions has been regarded as an important private benefit of having a large ownership (Holderness, 2003).[4]

In contrast, in a professional CEO family firm or a non-family firm, ownership is separated from management; accordingly, Type I agency problem arises. However, what distinguishes a professional CEO family firm from a non-family firm is the direct monitoring of the CEO by the

[4] Observing the recent poor performance at Ford, *Business Week* (August 21/28, 2006) commented that "CEO Bill Ford would have been fired by now by most boards if his name were Smith."

founding family in the former. Such monitoring is effective because the founding family has the expertise, the incentive, as well as the means to do so. First, since the founding family started the business, the family members know the business well so that it is easier for them than for other shareholders (including other blockholders) to judge whether the incumbent CEO is competent. Second, the founding family also has stronger incentives than other shareholders (including other blockholders) to monitor the CEO, given its less diversified asset holding, family name concern, and long investment horizon (e.g., Anderson, Mansi, and Reeb, 2003). Lastly, with large ownership and usually with representatives sitting on the board, the founding family is influential over key corporate decisions, including the CEO turnover decision. Consequently, Type I agency problems in professional CEO family firms can be effectively alleviated compared to those in non-family firms.

Is Type II agency problem a concern in professional CEO family firms or non-family firms with respect to the CEO retention decision? If the CEOs in these firms hold a large percentage of shares, then these firms are susceptible to Type II agency problem as well. However, such cases are rare. In our sample, only 2.8% of hired CEOs (in both professional CEO family firms and non-family firms) hold 5% or more of the company's stock. In addition, in a professional CEO family firm, since the CEO is not part of the founding family, the founding family is unlikely to protect the CEO from being fired due to poor performance. Similarly, the outside blockholders, if they exist, do not have the incentive to side with the poorly performing CEO in either professional CEO family firms or non-family firms.[5] Consequently, the Type II agency problem related to the CEO retention decision is moderate in these two types of firms.

In summary, over the CEO retention decision, professional CEO family firms face moderate Type I and Type II agency problems. In contrast, family CEO firms are subject to severe Type II agency problems and non-family firms are subject to severe Type I agency

[5] Outside blockholders in these two types of firms might alleviate the Type I agency problem over the CEO retention decision. Thus, in a sensitivity test we control for the existence of outside blockholders.

problems. Since both types of agency problem will reduce the CEO turnover-performance sensitivity, we predict that the CEO turnover-performance sensitivity for family CEO firms and non-family firms is lower than the sensitivity for professional CEO family firms. Stated formally, our first set of hypotheses is (in alternative forms): [6]

H1: CEO turnover-performance sensitivity is lower for family CEO firms than for professional CEO family firms.

H2: CEO turnover-performance sensitivity is lower for non-family firms than for professional CEO family firms.

Since family CEO firms are subject to severe Type II agency problems and non-family firms are subject to severe Type I agency problems, ex ante it is unclear which type of firm is subject to greater agency problems. If over the CEO turnover decision, the agency problem in family CEO firms is more severe than that in non-family firms, the CEO turnover-performance sensitivity is lower for family CEO firms than for non-family firms, and vice versa.

Note that we are not arguing that the professional CEO family firm is in general the best organization form of the three. The foregoing discussion of agency problems across the three types of firms is restricted to the CEO turnover decision. The extent of agency problems might be different in other settings.

2.3 Firm valuation differentials across the three types of firms

Replacing a poorly performing CEO can potentially improve firm performance and subsequently firm value. The evidence provided in prior research (e.g., Denis and Denis, 1995; Huson, Malatesta, and Parrino, 2004; Ertugrul and Krishnan, 2007) is consistent with this argument. Therefore, if agency problems are so severe that they prevent shareholders from replacing the poorly performing CEO, firm value will suffer. The more severe the agency

[6] As in prior studies (e.g., Anderson and Reeb, 2003; Anderson, Mansi, and Reeb, 2003; Villalonga and Amit, 2006), we treat firm type as exogenous, and empirically use lagged firm type to explain CEO turnover and firm value. In sensitivity tests, we address the potential endogeneity of firm type and firm value.

problems, the stronger the resistance from the poorly performing CEO, the lower the probability the CEO will be replaced, and the lower firm value will be. Since as argued above, family CEO firms are subject to more severe Type II agency problem and non-family firms are subject to more severe Type I agency problem than professional CEO family firms, we expect that all else equal, these two types of firms have lower value than professional CEO family firms after poor performance. Stated formally, our second set of hypotheses is (in alternative form):

H3: Given poor performance, family CEO firms are valued lower than professional CEO family firms.

H4: Given poor performance, non-family firms are valued lower than professional CEO family firms.

Note that this set of hypotheses compares firm value among different types of firms. While poor performance itself leads to lower firm value for all three types of firms (relative to periods with good performance), it would not lead to systematic differential firm value among the three types of firms if there were no differences in the severity of agency problems among them during this time period. In addition, we explicitly control for performance (i.e., stock returns) in our tests to address any potential confounding effect of differential performance across firm types.

3. Sample and Data

Our sample consists of 3,472 firm-years from 1,145 firms in the S&P 1500 Index (S&P 500 LargeCap, S&P MidCap 400, and S&P SmallCap 600 indices) covering the period 1996–1999.[7] These are the firms for which required data were available from Compustat (for financial accounting information), CRSP (for stock return information), ExecuComp, and Investor Responsibility Research Center (IRRC) (for CEO turnover, ownership, and corporate governance information).

[7] We acknowledge that our sample period coincides with the high-tech boom. However, we do not expect this to bias our inference in any particular direction due to the fact that our sample firms are from S&P 1500. In addition, we control for firm age and industry effects in sensitivity tests and our results are robust.

Our collection of ownership and the founding-family-related information involves several steps.[8] First, we start with ExecuComp and IRRC databases to identify key insiders (top executives and directors) for each company and to compile ownership for each insider.[9] Second, for each firm-year, we collect information about the founding family: the identity of founders, whether founders or their family members are actively involved (e.g., holding key executive positions, being directors or blockholders), and if they are actively involved, the ownership of the founding family. This step is completed through reading Hoover's Company Records, company proxy statements and websites. Third, from proxy statements we collect the identities and ownership of blockholders who are not insiders or founding family members. Lastly, we merge the above information with firm financial data from Compustat and CRSP. Additional information about corporate governance and institutional ownership is collected from IRRC and CDA Spectrum, respectively.

Panel A of Table 1 reports the composition of our sample. In contrast to prior studies on family firms that focus on S&P 500 or Fortune 500 firms, our sample includes 1,313 firm-years from S&P 500, 925 firm-years from S&P MidCap 400, and 1,201 firm-years from S&P SmallCap 600.[10] Given that family firms are on average smaller, 46% of the firm-years in our sample are from family firms, a higher percentage than in prior studies. Of the family firm group, 63% are family CEO firms (1,002 firm-years), and 37% are professional CEO family firms (599 firm-years). Among the 1,002 family CEO firm-years, 698 have founder CEOs and 302 have

[8] Our data collection process is similar to Villalonga and Amit (2006). The advantage of this process is that it generates a rich dataset that enables us to examine the impact of various dimensions of ownership structure and founding family involvement (e.g., family management, family ownership) on CEO turnover.
[9] During our data collection, we notice two issues with the ownership data reported in ExecuComp and IRRC databases: (1) The databases often report the total family ownership under each individual family member. (2) For companies with more than one class of voting shares (dual-class firms), the databases usually only report ownership in one class of shares (the choice of class seems arbitrary), and occasionally report the combined voting power. When these issues arise, we resort to proxy statements to make corrections. The ownership data for dual-class firms in this paper is based on the combined voting power.
[10] There are 33 firm-year observations with missing index classification information. Although they are not included in our index classification, they are included in our firm type classification and in the empirical analyses.

descendant CEOs (untabulated). The distribution based on the number of unique firms is very similar.

Panel B of Table 1 reports the summary statistics for the full sample and for each of the three types of firms. Family ownership is higher in family CEO firms than in professional CEO family firms (20.7% vs. 15.3%). Overall, 12.5% of the sample experiences CEO turnover. As expected, CEO turnover probability in non-family firms (12.9%) and family CEO firms (8.9%) is significantly lower than in professional CEO family firms (17.4%) (p-value < 0.01). In the sample, 76% of incoming CEOs for family CEO firms that experience CEO turnover are from outside the founding family while 24% of family CEOs pass the baton to their family members (untabulated). For the full sample, the mean (median) CEO age is 55.4 (55) and the mean (median) CEO tenure is 8.1 (6) years. CEOs in professional CEO family firms are on average slightly younger than their counterparts in family CEO and non-family firms. The average CEO tenure for professional CEO family firms and non-family firms (4.3 and 6 years, respectively) is much shorter than for family CEO firms (14.3 years).

Panel B also reports firm characteristics and corporate governance variables. Stock performance, measured as annual market-adjusted stock returns (using value-weighted market returns), is insignificantly different across the three types of firms – the median is similar and the mean is higher for family CEO firms due to some right-tail outliers.[11] Return on assets is higher for family CEO firms. Non-family firms are on average larger than professional CEO family firms, which are larger than family CEO firms. On average, family CEO firms have the highest Tobin's Q, followed by professional CEO family firms and then by non-family firms. Also, family firms are less likely to use leverage and equity compensation than non-family firms. The three types of firms are not statistically different from each other in other firm characteristics, including industry competition, growth, and return volatility. Non-family firms on average have

[11] The negative means/medians of market-adjusted returns are caused by the inclusion in the market index of NASDAQ stocks, which experienced high stock returns during the sample period.

better corporate governance than professional CEO family firms and family CEO firms (more independent boards, higher institutional ownership, higher outside blockholding, and fewer instances of dual class share structures), except for G-score, the ordering on which is opposite.

4. Tests of H1 and H2: CEO Turnover-Performance Sensitivity

4.1 Primary analyses

We use the following logit regression to test whether CEO turnover-performance sensitivity varies across firm types as predicted in H1 and H2:

$$\begin{aligned} Pr(CEO\_turnover = 1) = {} & \alpha_0 + \alpha_1 Performance \\ & + \alpha_{1a} Performance \times D\_FamilyCEO \\ & + \alpha_{1b} Performance \times D\_NonFamily \\ & + \alpha_2 D\_FamilyCEO + \alpha_3 D\_NonFamily \\ & + \alpha_4 CEO\_age + \alpha_5 CEO\_tenure + \alpha_6 Size + \alpha_7 N\_firm + \varepsilon, \end{aligned} \quad (1)$$

where:

CEO_turnover	= 1 for firm-years with CEO turnover in the next year, and 0 otherwise;
Performance	= annual market-adjusted stock returns;
D_FamilyCEO	= 1 for family CEO firms, and 0 otherwise;
D_NonFamily	= 1 for non-family firms, and 0 otherwise;
CEO_age	= CEO's age in years;
CEO_tenure	= the number of years the CEO has been at the current position;
Size	= firm size, measured as log transformation of total assets (in millions);
N_firm	= the number of firms in the same industry (defined based on 3-digit SIC codes) in Compustat.

Firm and year subscripts are omitted for brevity. Note that all independent variables are measured in the year before CEO turnover.

The parameters of interest are the interactions between the performance measure and the two dummy variables indicating family CEO firms (*D_FamilyCEO*) and non-family firms (*D_NonFamily*). The coefficient on the performance measure, α_1, captures the CEO turnover-performance sensitivity for professional CEO family firms; the coefficient on the interaction between the performance measure and *D_FamilyCEO*, α_{1a}, captures the incremental sensitivity for family CEO firms; and the coefficient on the interaction between the performance measure

and *D_NonFamily*, α_{1b}, captures the incremental sensitivity for non-family firms. Since turnover-performance sensitivity is negative, H1 and H2 imply that both α_{1a} and α_{1b} are positive. The net performance sensitivity for family CEO firms (non-family firms) is $\alpha_1 + \alpha_{1a}$ ($\alpha_1 + \alpha_{1b}$), and the difference between family CEO firms and non-family firms is $\alpha_{1a} - \alpha_{1b}$. We also include the two firm-type dummy variables in the model to capture the difference in the CEO turnover probability independent of firm performance across firm types.

Following prior empirical research on CEO turnover (e.g., Denis et al., 1997b), we control for CEO age, CEO tenure, firm size, and industry competition. Older CEOs are more likely to leave the position due to health, retirement, or other reasons. Prior research finds that after controlling for CEO age, CEO turnover probability decreases with CEO tenure, which likely reflects a CEO's power accumulated over time in the CEO position. Prior research also finds that CEO turnover probability is lower for large firms than for small firms. Another important determinant of CEO turnover is industry competition. Both DeFond and Park (1999) and Parrino (1997) find a positive relation between CEO turnover probability and industry competition. Following Dai (2005), we use the number of firms in the same 3-digit SIC industry to measure industry competition.[12, 13]

Table 2 reports the regression results. We compute the marginal effect for each variable to assess the economic significance of our estimates. As in prior research (e.g., Denis et al., 1997b), we calculate the change in implied CEO turnover probability when the variable of interest changes from its 25th to 75th percentile value, or from 0 to 1 if the variable is a dummy variable, with all other explanatory variables held constant at their respective means.

Before discussing variables of interest, we would like to note that the results for all of the control variables (except CEO tenure) are consistent with prior literature. CEO age has a strong

[12] Another commonly used proxy for industry competition is Herfindahl index. In our sample, Herfindahl index is highly correlated with the number of firms in the same industry: the correlation coefficient is -0.66. Including Herfindahl index as an additional control does not affect the results on other variables.
[13] The inferences are the same when year dummies are included to address potential correlations among observations in our panel data.

positive impact on CEO turnover; firm size is negatively correlated with turnover probability; and industry competition has a positive effect on CEO turnover.

As reported in the table, the turnover-performance sensitivity is significantly negative for professional CEO family firms. More importantly, consistent with our predictions in H1 and H2, both incremental sensitivities are positive and significant at the 0.01 level. That is, CEO turnover is less sensitive to performance for both family CEO firms and non-family firms. The increase in CEO turnover probability when stock return decreases from its 75^{th} to 25^{th} percentile value is 13.7 percentage points for professional CEO family firms, but it is 13.6 percentage points lower for family CEO firms and 10.1 percentage points lower for non-family firms. These differences in turnover-performance sensitivity are economically significant given that the sample average CEO turnover probability is about 13% and that the implied change in CEO turnover probability for age, which has been regarded as the most important explanatory variable for CEO turnover, is 9.6%. Note that the marginal effect of performance for professional CEO family firms is larger than that reported in prior studies for average firms. This is simply due to our partitioning of the sample. Without separating the sample into different firm types, the marginal effect of performance is 3.1%, comparable to prior studies (untabulated). Apparently firm type creates large disparity in turnover-performance sensitivity.

An alternative explanation of our results is that professional CEO family firms hire less talented CEOs and consequently they are more likely to be replaced after poor performance. We rule out this possibility based on the following. First, since the founding family stands to gain the most from good performance, it is thus likely that the founding family will hire more talented, rather than less talented, professional CEOs. Second, as we show below in our valuation analysis, we find that professional CEO family firms have higher firm value after poor performance than both family CEO firms and non-family firms. This result is inconsistent with the argument that professional CEO family firms have less talented CEOs.

The bottom of Table 2 reports the net turnover-performance sensitivity for family CEO firms and for non-family firms and the difference between the two. While the marginal effect of performance is as high as 13.7% for professional CEO family firms, it is only 3.6% (statistically significant) for non-family firms and is indistinguishable from zero (both statistically and economically) for family CEO firms. The difference between the latter two is significantly different from zero at the 0.007 level, suggesting that the agency problem in the CEO turnover setting is more severe for family CEO firms than for non-family firms.

4.2 Additional analyses: Controlling for CEO ownership, founder status, and the level of family ownership

The analyses presented above provide consistent evidence that severe Type II agency problem in family CEO firms and Type I agency problem in non-family firms reduce their CEO turnover-performance sensitivity. In this subsection, we investigate the significance of our results relative to CEO ownership or founder status, two factors which likely correlate with our firm type classification. Given that prior research has documented significant impact on CEO turnover of these two variables, it is important for us to show that firm type itself affects CEO turnover over and above CEO ownership or founder status. In addition, we also test whether the level of family ownership has incremental impact on CEO turnover-performance sensitivity over firm types.

CEO equity ownership provides the CEO with economic incentive to exert effort in general, but it is also likely to make the CEO entrenched and difficult to be replaced when he has performed poorly. This leads to a negative association between turnover-performance sensitivity and CEO ownership, as documented in Denis et al. (1997b). To investigate whether our results are driven by differential CEO ownership in the three types of firms, we add both CEO ownership and the interaction of CEO ownership with performance to regression (1). Panel A of Table 3 provides the empirical results. Consistent with prior research, we find that CEO ownership has a

negative impact on turnover probability and reduces the turnover-performance sensitivity. However, our results of interest, the differences in CEO turnover-performance sensitivity among the three types of firms, remain the same. This shows that firm type itself is an important factor in explaining CEO turnover decision above and beyond CEO ownership.

Prior research finds that founder status reduces CEO turnover probability (e.g., Brickley 2003). Given that family CEOs consist of founder CEOs and descendant CEOs, we partition family CEO firms into founder CEO family firms and descendant CEO family firms. We separately examine the effect of founder CEO and descendant CEO on CEO turnover probability and turnover-performance sensitivity. Panel B of Table 3 reports the empirical results. Column (1) provides results when founder CEO dummy and descendant CEO dummy are included. Consistent with prior studies, founder status affects turnover probability negatively. This negative effect also applies to descendant CEOs (the coefficients on the two dummies are similar). In Column (2), we add the interaction of the two dummies with performance. We find that both founder CEOs and descendant CEOs are associated with lower turnover-performance sensitivity than professional CEOs in family firms. Descendant CEOs are associated with even lower turnover-performance sensitivity than founder CEOs. Again, with founder CEO control, our turnover-performance sensitivities consistently differ across firm types as predicted.

Given that the aggravation of Type II agency problem in family CEO firms and the alleviation of Type I agency problem in professional CEO family firms result from the founding family's presence, we expect that the effect of the family presence is stronger when the level of family ownership is higher. To test this implication, we use 25% ownership as a cutoff and further partition family firms into high family ownership group and low family ownership group. Consequently, we have four types of family firms: professional CEO family firms with low or high family ownership, and family CEO firms with low or high family ownership. The regression results are reported in Panel C of Table 3. Note that in this regression, the coefficient on performance captures the turnover-performance sensitivity for professional CEO family firms

with low family ownership. As expected, professional CEO family firms with high family ownership have an even higher sensitivity (coef.=-2.56, p=0.050), consistent with better monitoring of hired CEOs by founding families with higher ownership. Also as expected, the turnover-performance sensitivity is lower for family CEO firms with high family ownership than for those with low family ownership (coef.=1.78, p=0.026), consistent with more severe Type II agency problems in the former. These results reinforce the inferences from the main turnover analyses: family ownership, when separated from management, can lead to effective monitoring of CEOs, but when combined with management, can lead to severe Type II agency problems.

4.3 Other sensitivity tests

To check the robustness of our CEO turnover results, we conduct a series of sensitivity tests by controlling for corporate governance, by using alternative performance measures, and by examining forced CEO turnover. Our inferences regarding H1 and H2 remain unchanged.

First, since family firms differ from non-family firms in corporate governance, we test whether our inferences would change after controlling for the difference in corporate governance. To this end, we add the following control variables that could potentially affect CEO turnover decision: board independence (Weisbach, 1988), institutional ownership and the existence of blockholders other than the founding family (Holderness, 2003), G-score (Gompers, Ishii, and Metrick, 2003), and dual class structure (Gompers, Ishii, and Metrick, 2004). The measurement of these variables follows prior studies. The results are reported in Column (1) of Table 4. Three out of the five corporate governance variables (board independence, institutional ownership, and G-score) are statistically significant in predicted directions: firms with stronger corporate governance have higher CEO turnover probability. Interestingly, the existence of outside blockholders does not increase CEO turnover probability after controlling for other factors. Additional analyses, not tabulated for the sake of brevity, indicate that the existence of outside blockholders does not increase turnover-performance sensitivity either. This result suggests that

family blockholders are more effective monitors in the CEO turnover setting than other blockholders. Last and more importantly, our estimates of turnover-performance sensitivities for the three types of firms are quantitatively similar to those reported in Table 2. So we conclude that the variation in corporate governance across firm types does not affect our results.[14]

Second, we investigate whether our results are robust to alternative performance measures. We test H1 and H2 using the following three alternative measures: average market-adjusted stock returns in the past three years (Table 4, Column (2)), volatility-adjusted stock returns (Column (3)), and an accounting performance measure: industry-adjusted return on assets (Column (4)). The first measure captures the persistence of poor performance and the second controls for the volatility in stock returns. If a CEO happens to have a poor performance in a year due to bad luck, the board might not consider replacing the CEO. However, persistent poor performance is more likely to prompt the board to take action.[15] Following Dai (2005), we control for return volatility when using the volatility-adjusted stock return measure in Column (3). Finally, prior studies have shown that accounting performance can also explain CEO turnover, although it is not as powerful as stock returns, which contain more information than historically-based accounting performance (e.g., DeFond and Park, 1999; Engel, Hayes, and Wang, 2003).

As reported in Columns (2), (3), and (4), the results on turnover-performance sensitivities are similar when these alternative performance measures are used. The sensitivity is significantly negative in professional CEO family firms and becomes significantly weaker (i.e., less negative) in family CEO firms and non-family firms. Note that the magnitudes of the coefficients using these alternative performance measures are not directly comparable due to the scale difference in the measures. In sum, our inferences are robust to these alternative performance measures.

[14] In untabulated tests, we also add to the regression the interaction of performance and corporate governance variables. The coefficients on our variables of interest remain similar.

[15] Adams, Almeida, and Ferreira (2005) find that the more powerful the CEO (e.g., founder CEOs), the more volatile the firm performance will be. By using the average return of the past three years and volatility-adjusted stock returns, we control for the potential impact of volatility on our results.

Third, we use forced CEO turnover to test H1 and H2 to see whether the inferences are similar. The advantage of examining forced turnover is that forced turnover supposedly better captures CEO turnover due to poor performance, but the drawback is the subjectivity we have to apply in classifying the turnover events.[16] Given the bias embedded in the statement announcing CEO turnover, we define a forced turnover as either when the statement says that the CEO is fired, demoted, or forced to resign, or when the statement says that the CEO is retiring, but the CEO is 60 or younger at the time. This classification is similar to that used in prior research (e.g., Huson et al., 2004). Based on this classification, 233 firm-years of our sample experienced forced turnover, a probability of 6.7%. The logit regression results for forced turnover are reported in Table 5.[17] Consistent with the results based on all CEO turnover and our hypotheses, the forced turnover results indicate that professional CEO family firms have the highest turnover-performance sensitivity, followed by non-family firms and then by family CEO firms.

Lastly, it is possible that increased CEO turnover is not only associated with poor performance, but also associated with good performance. A CEO with exceptionally good performance might be attracted away by higher pay or higher social status. While this possibility itself will not drive our results, as it actually leads to a positive relation between CEO turnover probability and performance, the variation of such possibility across firm types might confound our results. For example, founders may be more likely to pass the CEO position on to descendants after good performance, leading to lower turnover-performance sensitivity in family CEO firms. We conduct two analyses to address this alternative explanation. First, we focus on the sub-sample with good performance – firm-years with performance higher than the median – and find that there is no reliable relation between CEO turnover and performance, suggesting that the

[16] Apparently to avoid negative publicity for both the company and the CEO involved, the announcement a company makes regarding CEO turnover is unlikely to be straightforward. For example, many firms would choose to use the word "retirement" for the outgoing CEO even though the accompanying information may indicate otherwise. Accordingly, we have to use judgment in determining the nature of CEO turnover. We collect CEO turnover announcements from Lexis and Nexis.

[17] Following Denis et al. (1997b), we do not include CEO age as an explanatory variable because forced turnover should not depend on CEO age.

alternative explanation is unlikely to hold. Second, we replicate our main analyses after deleting the top 10%, 25% or even 50% performers and obtain similar inferences, also suggesting that our results are not driven by CEO turnover after good performance.

Overall, the empirical tests from Table 2 to Table 5 provide strong support to our first set of hypotheses (H1 and H2): both family CEO firms and non-family firms have lower turnover-performance sensitivity than professional CEO family firms. The differences in sensitivities are both statistically and economically significant. We conclude from these results that while the founding family's presence has mitigated agency problems in professional CEO family firms, it apparently has aggravated the agency problems related to CEO retention decisions in family CEO firms.

5. Tests of H3 and H4: Differential firm valuation across firm types

5.1 Primary analyses

Our empirical results presented in Section 4 provide consistent evidence that with regard to CEO turnover decision, family CEO firms and non-family firms are subject to more severe agency problems than professional CEO family firms. Given that agency cost, or the difficulty in replacing poorly performing CEOs, can lead to a reduction in firm value, we now examine whether, as hypothesized in H3 and H4, professional CEO family firms have higher firm value than family CEO firms or non-family firms *after* poor performance. Since we are interested in the firm value comparison during the time period when a firm is likely facing a CEO turnover decision, we focus our tests on the poor performance period. For completeness, we also extend the analysis to other periods (i.e., periods other than the poor performance period). Note that this design is different from prior studies (Anderson and Reeb, 2003; Villalonga and Amit, 2006), which focus only on firm-type partition (e.g., family firms vs. non-family firms) and do not condition the analyses on past firm performance.

Following Morck et al. (1988), Anderson and Reeb (2003), and Villalonga and Amit (2006), we use Tobin's Q as our proxy for firm value and regress Tobin's Q at the end of the year on firm-type dummies, control variables, and industry and year indicators as follows:

$$Tobin's\ Q = \alpha_0 + \alpha_1 D\_FamilyCEO + \alpha_2 D\_NonFamily + \boldsymbol{\beta}\, Control Variables + \boldsymbol{\gamma}\, Industry\ Dummies + \boldsymbol{\delta}\, Year\ Dummies + \varepsilon \quad (2)$$

Tobin's Q is measured as the ratio of a firm's market value of assets to its book value of assets. The choice and measurement of control variables (i.e., firm size, growth, return volatility, leverage, board independence, blockholding, and CEO equity compensation) are the same as in prior research to facilitate comparisons. H3 and H4 imply that $\alpha_1 < 0$ and $\alpha_2 < 0$, respectively, after the poor performance period. In our empirical tests, the poor performance period refers to those firm-years when the market-adjusted return falls in the bottom quartile of the sample distribution.[18] Note that **β**, **γ,** and **δ** are vectors.

One particular control variable that we include is stock return. This control is important to us because we would like to remove any concern that our results are driven by differential stock return across the three types of firms. Even though all the firms used in the poor performance period analysis have stock return in the bottom quartile of the sample distribution, if family CEO firms or non-family firms have lower stock return than professional CEO family firms, then results consistent with H3 and H4 could simply be due to the mechanical relation between stock return and Tobin's Q.

Table 6 presents the empirical results. Column (1) reports the results for the poor performance period. As predicted in H3 and H4, we find that professional CEO family firms are valued at a premium over both family CEO firms and non-family firms for this poor performance period. Tobin's Q is 0.235 lower for family CEO firms and 0.151 lower for non-family firms than for professional CEO family firms. Both differences are statistically significant, with p-value of

[18] The inferences are the same when we use alternative cutoff points (e.g., the bottom 20% or 30% of the sample distribution).

0.006 and 0.043 respectively. The bottom of Table 6 also compares the value of family CEO firms and that of non-family firms: the result indicates that the difference between the two types of firms is insignificant at conventional levels.

These results are consistent with our hypotheses and the CEO turnover results discussed in Section 4. Relative to a professional CEO family firm, replacing a poorly performing CEO is more difficult in a family CEO firm due to its severe Type II agency problem or in a non-family firm due to its severe Type I agency problem. Expecting these, the stock market assigns lower value to non-family firms and family CEO firms, but higher value to professional CEO family firms after the poor performance period.

Column (2) reports the results for other periods, i.e., periods with average or above-average performance. The empirical findings show that family CEO firms outperform non-family firms during these periods. This out-performance may be attributable to founder CEO expertise and/or the alleviation of agency problem, as suggested in prior research (Fahlenbrach, 2005; Villalonga and Amit, 2006). Results for the full sample, in Column (3), are basically weighted averages of the results in the previous two columns. They show a value premium of family CEO firms over non-family firms.

One interesting issue that immediately follows from these results is whether the disappearance of valuation premium for family CEO firms (relative to non-family firms) during the poor performance period, as shown in Table 6, contradicts the well-established family firm premium and founder CEO premium (relative to non-family firms) (Anserson and Reeb, 2003; Villalonga and Amit, 2006). We now turn to this issue in the next subsection.

5.2 Reconciliation with prior studies on family firm premium

To reconcile our results with prior studies, we adopt the design in prior studies and estimate the following two regressions:

$$Tobin's\ Q = \alpha_0 + \alpha_1 D\_FamilyFirm + \boldsymbol{\beta}\, ControlVariables + \boldsymbol{\gamma}\, IndustryDummies + \boldsymbol{\delta}\, YearDummies + \varepsilon \quad (3)$$

$$Tobin's\ Q = \alpha_0 + \alpha_1 D\_FounderCEO + \alpha_2 D\_DescendantCEO + \alpha_3 D\_ProfessionalCEO + \boldsymbol{\beta}\, ControlVariables + \boldsymbol{\gamma}\, IndustryDummies + \boldsymbol{\delta}\, YearDummies + \varepsilon \quad (4)$$

We now use *non-family firms* as the benchmark group and investigate the average family firm premium (including both family CEO firms and professional CEO family firms) in the first specification and the premium/discount of each type of family firms – founder CEO, descendant CEO, and professional CEO family firms – in the second specification. The regression results are reported in Panel A and Panel B of Table 7, respectively. Because Table 6 already compares professional CEO family firms with non-family firms, the following discussion focuses first on family firms as a group, then on founder CEO firms and descendant CEO firms. To highlight the importance of conditioning the valuation analyses on past firm performance, for each regression analysis we first estimate the regression using the full sample and then separately for the poor performance period and for other periods.

We replicate the well-established family firm premium in Column (1) of Panel A. Consistent with prior studies, we find that family firms on average command higher value than non-family firms: Tobin's Q is 0.184 higher, significant at the 0.002 level. However, when we separate the poor performance period from other periods, we find that family firm premium disappears for the poor performance period (the difference in Tobin's Q is -0.036, insignificantly different from zero). On the other hand, family firm premium is significant in other periods: Tobin's Q is 0.247 higher in family firms than in non-family firms. The disappearance of family firm premium in the poor performance period is apparently driven by family CEO firms, not by professional CEO family firms, which as shown in Table 6 (column (1)) enjoy a valuation premium over non-family firms in such a period.

We further replicate the founder premium and descendant discount results as documented in Villilonga and Amit (2006) in Column (1) of Panel B. We find that, on average, founder CEOs

are associated with a significant premium (Tobin's Q is 0. 279 higher) and descendant CEOs are associated with a significant discount (Tobin's Q is 0.166 lower). However, when we partition the full sample into the two periods, we find that during the poor performance period, the founder premium disappears, and descendant discount becomes even larger. This result provides further consistent evidence linking our turnover analyses to valuation analyses. In contrast, during other periods, founder CEO firms enjoy a large premium, and descendant CEO firms are associated with an insignificant discount.

In sum, while we confirm the well-established family firm premium (including founder CEO premium and descendant CEO discount) for the full sample, we show that the premium disappears and the discount increases when the agency problems in family CEO firms are severe. Specifically, during the poor performance period when agency problems related to the CEO retention decision are likely to be severe, family firms no longer command a value premium (over non-family firms). Furthermore, among family firms, founder CEOs lose the premium, descendant CEOs are associated with a large discount, and only professional CEO family firms have a valuation premium. These results suggest that the family presence mitigates agency problems in professional CEO firms while it aggravates agency problem in family CEO firms in the CEO turnover setting.

5.3 Sensitivity Tests

To check the robustness of our valuation results, we conduct the following sensitivity tests. (For the sake of brevity, we focus on the main results reported in Column (1) of Table 6 which tests H3 and H4.) First, we use lagged firm-type dummies in the valuation regression. The main motivation for this is to address the potential endogeneity between firm type and Tobin's Q. One might argue that a family CEO firm might decide to stay as a family CEO firm if the founding family expects the future performance to be good or decide to transform itself into a professional CEO family firm or further into a non-family firm if the family expects future performance to be

bad. Anderson and Reeb (2003) argue that this argument is arduous because it rests on a strong assumption that the founding family has special insights about future performance. The argument is even less relevant to our results as we find that given poor performance, family CEO firms have *lower*, not higher, firm value than professional CEO family firms. Nevertheless, we address this possible endogeneity issue by using lagged firm-type variables, which are unlikely to be affected by future Tobin's Q. The results are presented in Column (1) of Table 8. The inferences remain the same. We observe a valuation premium during the poor performance period for professional CEO family firms over both family CEO firms and non-family firms.

We also use a 2SLS approach to address the endogeneity issue as in prior research (Anderson and Reeb, 2003; Villalonga and Amit, 2006). Specifically, we use as our instruments firm size, squared firm size, and return volatility, along with other controls to predict firm type, and then use the predicted firm type to explain Tobin's Q. Since we cannot predict the three types of firms at the same time, we separately investigate family CEO firm discount and non-family firm discount (relative to professional CEO family firms). Because this design (i.e., using two separate regressions, rather than one regression, to test H3 and H4) is different from other analyses reported so far, we do not report the results from this 2SLS approach, which lead to the same inferences as the main analyses.

Second, rather than using stock returns, we use operating performance as our partition variable. We define the poor performance period as firm-years with industry-adjusted return on assets falling into the bottom quintile of the sample distribution. The results are reported in Column (2) of Table 8. Once again, the coefficient estimates associated with both family CEO firm dummy and non-family firm dummy are consistent with our main results.

Overall, these sensitivity tests indicate that our results are robust: family CEO firms and non-family firms have a lower value than professional CEO family firms during a time period when the agency problems related to CEO turnover are intensified.

6. Conclusions

Agency problems with the CEO retention decision are likely to be severe when a CEO has performed poorly. Such agency problems can reduce the CEO turnover-performance sensitivity and firm value. In this paper, we examine how the CEO turnover-performance sensitivity varies across three types of firms – family CEO firms, professional CEO family firms, and non-family firms – in order to shed light on the impact of the founding family's presence on agency problems. Whether family firms are subject to agency problems depends on family firm type. For professional CEO family firms, effective monitoring by the founding family mitigates the potential Type I agency problem relative to non-family firms, leading to a higher CEO turnover-performance sensitivity. However, for family CEO firms, the founding family protects the family CEO from being fired due to poor performance and thus aggravates Type II agency problem, leading to a lower turnover-performance sensitivity than professional CEO family firms. The empirical results are consistent with both predictions.

We then investigate how the agency problems manifested in the CEO turnover decision affect firm value during the poor performance period. We find that, during the poor performance period, professional CEO family firms, which are subject to less severe agency problems in the CEO turnover setting, are valued at a premium over both family CEO firms and non-family firms. In addition, relative to non-family firms, family firms as a whole do not enjoy valuation premium during the poor performance period. Founder CEOs are associated with no valuation premium, descendant CEOs are associated with a significant valuation discount, and only professional CEO family firms enjoy a valuation premium. These results contrast with the family firm valuation premium documented in prior studies. The finding in prior studies is apparently attributed to other periods, when agency problems over the CEO turnover setting in family CEO firms are not as severe as during the poor performance period.

Overall, our analyses indicate that in the CEO turnover setting, the presence of the founding family has a significant impact on the agency problems. While it reduces the agency

problems between shareholders and managers when the family does not serve as the CEO, i.e., in the case of professional CEO family firms, it aggravates the agency problem between small and large shareholders when a family member serves as the CEO. Such impact is systematically reflected in CEO turnover-performance sensitivity and firm value after poor performance.

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Table 1 Sample composition and descriptive statistics

This table reports the composition and characteristics of our sample, which consists of 3,472 firm-years from 1,145 firms in the S&P 1500 Index (S&P 500, S&P MidCap 400, and S&P Small-Cap 600 indices) covering the period 1996-1999.

Panel A Sample composition

	Number of firm-years		Number of unique firms	
	N	Percent	N	Percent
Total	3,472	100%	1,145	100%
Composition by S&P Index[*]				
S&P 500	1,313	38%	361	32%
S&P MidCap 400	925	27%	320	29%
S&P SmallCap 600	1,201	35%	432	39%
Composition by firm type				
Family firms	1,601	46%	545	48%
Family CEO	1,002	29%	357	32%
Professional CEO	599	17%	188	16%
Non-family firms	1,871	54%	600	52%

[*] 33 firm-years of 32 firms have missing index classification value in Compustat.

Table 1 Sample composition and descriptive statistics (Cont'd)

Panel B Descriptive statistics

This panel reports the descriptive statistics of CEO and firm characteristics for the full sample and for each type of firm.

	Full sample (N=3,472)			Family CEO firms (N=1,002)			Professional CEO family firms (N=599)			Non-family firms (N=1,871)		
	Mean	Std.	Median	Mean	Std.	Median	Mean	Std.	Median	Mean	Std.	Median
Family ownership (%)	8.60	17.30	0	20.68	22.71	13.10	15.26	18.81	8.00	0	0	0
CEO information												
CEO_turnover	0.125	0.331	0	0.089	0.285	0	0.174	0.379	0	0.129	0.335	0
CEO_age	55.4	7.3	55	55.8	9.6	56	54.5	6.4	55	55.4	6.2	56
CEO_tenure	8.1	7.8	6	14.3	9.7	13	4.3	4.1	3	6.0	5.1	5
Firm characteristics												
Stock return	-0.035	0.459	-0.103	0.013	0.557	-0.103	-0.047	0.407	-0.106	-0.058	0.412	-0.104
Return on assets	0.020	0.084	0.013	0.023	0.101	0.018	0.015	0.090	0.013	0.021	0.071	0.011
Size ($ million)	10,002	37,196	1,472	2,840	10,429	732	5,940	22,981	1,278	15,138	47,768	2,514
N_firm	166	257	56	180	287	55	159	255	42	160	240	64
Tobin's Q	2.469	2.598	1.769	2.810	2.323	1.889	2.615	5.080	1.839	2.306	2.140	1.708
Growth	0.046	0.117	0.005	0.065	0.162	0.000	0.026	0.052	0.000	0.042	0.099	0.008
Return volatility	0.107	0.049	0.097	0.120	0.050	0.114	0.099	0.047	0.089	0.103	0.047	0.093
Leverage	0.184	0.152	0.170	0.154	0.166	0.098	0.180	0.147	0.161	0.197	0.144	0.186
CEO equity comp. (%)	40.04	29.44	40.75	33.62	32.49	28.75	34.90	28.73	31.43	43.41	27.62	44.33
Corporate governance variables												
Board independence	0.612	0.180	0.625	0.509	0.179	0.500	0.560	0.154	0.583	0.684	0.153	0.706
Inst. ownership (%)	58.22	18.49	59.37	54.47	18.93	53.80	55.44	18.10	56.36	61.14	17.87	63.09
Blockholding (%)	14.82	12.97	12.80	13.17	11.83	11.45	13.62	12.51	10.40	16.09	13.56	14.46
G-score	9.242	2.780	9.000	8.179	2.754	8.000	9.340	2.848	9.000	9.693	2.631	10.000
Dual class	0.057	0.231	0.000	0.123	0.328	0.000	0.073	0.261	0.000	0.016	0.126	0.000

Table 1 Sample composition and descriptive statistics (Cont'd)

Notes to Table 1:
The variables are measured one year before CEO turnover and are defined as follows:

Family ownership	= percentage of shares held by the founding family;
CEO_turnover	= 1 for firm-years with CEO turnover in the next year, and 0 otherwise;
CEO_age	= CEO's age in years;
CEO_tenure	= the number of years the CEO has been CEO;
Stock return	= annual market-adjusted stock return;
Return on assets	= firm return on assets minus value-weighted industry return on assets;
Size	= firm size, measured as total assets (in millions);
N_firm	= the number of firms in the same industry (defined based on 3-digit SIC codes) in Compustat;
Tobin's Q	= the ratio of a firm's market value of assets to its book value of assets at year-end;
Growth	= R&D/total assets;
Return volatility	= the standard deviation of monthly market-adjusted stock returns;
Leverage	= long-term debt/total assets;
CEO equity comp.	= the value of the CEO's annual stock and option grants divided by total CEO pay;
Board independence	= the proportion of independent directors sitting on the board of directors;
Inst. ownership	= percentage of outstanding shares held by institutional investors;
Blockholding	= percentage of outstanding shares held by blockholders other than the founding family;
G-score	= count of anti-takeover measures developed by Gompers, Ishii, and Metrick (2003);
Dual class	= 1 if the company has dual-class shares, and 0 otherwise.

Table 2 CEO turnover–performance sensitivity

This table reports results from the following regression:

$$\begin{aligned}\Pr(CEO\_turnover = 1) = {} & \alpha_0 + \alpha_1 Performance \\ & + \alpha_{1a} Performance \times D\_FamilyCEO \\ & + \alpha_{1b} Performance \times D\_NonFamily \\ & + \alpha_2 D\_FamilyCEO + \alpha_3 D\_NonFamily \\ & + \alpha_4 CEO\_age + \alpha_5 CEO\_tenure + \alpha_6 Size + \alpha_7 N\_firm + \varepsilon\end{aligned} \quad (1)$$

The sample includes 3,472 firm-years in the period 1996-1999. The p-values (in the parentheses) are based on one-sided tests for directional predictions and on two-sided tests otherwise. The last column reports the implied change in the probability of CEO turnover due to a change in the corresponding variable.

	Predicted Signs	Estimate (p-value)	Marginal effect *
Intercept	?	-15.82 (0.001)	
Performance	−	**-2.99 (0.001)**	**-13.7%**
Performance×D_FamilyCEO	+	**2.77 (0.001)**	**13.6%**
Performance×D_NonFamily	+	**1.38 (0.013)**	**10.1%**
D_FamilyCEO	−	-2.94 (0.001)	-10.7%
D_NonFamily	−	-0.73 (0.001)	-5.8%
CEO_age	+	0.25 (0.001)	9.6%
CEO_tenure	−	0.01 (0.793)	0.3%
Size	−	-0.16 (0.001)	-1.2%
N_firm	+	0.19 (0.001)	1.4%
Likelihood ratio (p-value)		560.5 (0.001)	
Additional tests			
Turnover-performance sensitivity for family CEO firms ($\alpha_1+\alpha_{1a}$)		-0.22 (0.632)	-0.1%
Turnover-performance sensitivity for non-family firms ($\alpha_1+\alpha_{1b}$)		-1.61 (0.001)	-3.6%
Difference in sensitivity between family CEO and non-family firms ($\alpha_{1a}-\alpha_{1b}$)		1.39 (0.007)	3.5%

Table 2 CEO turnover–performance sensitivity (Cont'd)

Notes to Table 2:
The variables are defined as follows:

CEO_turnover	= 1 for firm-years with CEO turnover in the next year, and 0 otherwise;
Performance	= annual market-adjusted stock return;
D_FamilyCEO	= 1 for family firms with a member from the founding family as the CEO, and 0 otherwise;
D_NonFamily	= 1 for non-family firms, and 0 otherwise;
CEO_age	= CEO's age in years;
CEO_tenure	= the number of years the CEO has been CEO;
Size	= firm size, measured as log transformation of total assets (in millions);
N_firm	= the number of firms in the same industry (defined based on 3-digit SIC codes) in Compustat.

Note that all explanatory variables are measured in the year before CEO turnover is measured.

* Implied change in the probability of CEO turnover is calculated as follows:

- For *Performance*, it is calculated as the change in CEO turnover probability for professional CEO family firms, due to a change in performance from its 25th to its 75th percentile value, with the control variables taking their respective means. For *Performance* × *D_FamilyCEO* (*Performance* × *D_NonFamily*), it is calculated as the difference in the implied change in CEO turnover probability due to the change in performance between family CEO firms (non-family firms) and professional CEO family firms.
- For *D_FamilyCEO* (*D_NonFamily*), it is calculated as the difference in CEO turnover probability between family CEO firms (non-family firms) and professional CEO family firms, with *Performance* and control variables taking their respective means.
- For control variables (*CEO_age*, *CEO_tenure*, *Size*, *N_firm*), it is calculated as the change in CEO turnover probability when the given variable changes from its 25th to its 75th percentile value, with all other independent variables taking their respective means.

Table 3 Additional tests of CEO turnover–performance sensitivity

Panel A Controlling for CEO ownership

This panel reports the results of the logit regression of CEO turnover probability on performance, firm type dummies, their interactions, and control variables. The specification is similar to equation (1) in Table 2, except that we add CEO ownership and the interaction of CEO ownership with performance. See Table 2 for the measurement of other variables. The sample includes 3,472 firm-years in the period 1996–1999. The p-values in parentheses are based on one-sided tests for directional predictions and are based on two-sided tests otherwise.

	Predicted Signs	CEO ownership effect only	Both firm type and CEO ownership effects
Intercept	?	-18.70	-18.01
		(0.001)	(0.001)
Performance	−	**-1.71**	**-3.84**
		(0.001)	**(0.001)**
Performance×D_FamilyCEO	+		**3.31**
			(0.001)
Performance×D_NonFamily	+		**2.45**
			(0.001)
D_FamilyCEO	−		-1.68
			(0.001)
D_NonFamily	−		-0.40
			(0.032)
CEO ownership	−	**-0.17**	**-0.13**
		(0.001)	**(0.001)**
Performance×CEO ownership	+	**0.13**	**0.07**
		(0.006)	**(0.098)**
CEO_age	+	0.29	0.28
		(0.001)	(0.001)
CEO_tenure	−	-0.01	0.02
		(0.96)	(0.956)
Size	−	-0.14	-0.14
		(0.001)	(0.002)
N_firm	+	0.15	0.1483
		(0.002)	(0.003)
Likelihood ratio		537.5	570.0
(p-value)		(0.001)	(0.001)
Additional tests			
Turnover-performance sensitivity for family CEO firms ($\alpha_1+\alpha_{1a}$)			-0.53
			(0.318)
Turnover-performance sensitivity for non-family firms ($\alpha_1+\alpha_{1b}$)			-1.39
			(0.001)
Difference in sensitivity between family CEO and non-family firms ($\alpha_{1a}-\alpha_{1b}$)			0.86
			(0.145)

Table 3 Additional tests of CEO turnover–performance sensitivity (Cont'd)

Panel B Partition of family CEO firms into founder CEO firms and descendant CEO firms

This panel reports the results of the logit regression of CEO turnover probability on performance, firm type dummies, their interactions, and control variables. The specification is similar to equation (1) in Table 2, except that we partition family CEO firms into founder CEO firms and descendant CEO firms and interact these two dummies with firm performance. See Table 2 for the measurement of other variables. The sample includes 3,472 firm-years in the period 1996–1999. The p-values in parentheses are based on one-sided tests for directional predictions and are based on two-sided tests otherwise.

	Predicted Signs	(1)	(2)
Intercept	?	-15.75	-15.92
		(0.001)	(0.001)
Performance	−	**-2.98**	**-3.00**
		(0.001)	**(0.001)**
Performance×D_FamilyCEO	+	**2.89**	
		(0.001)	
Performance×D_FounderCEO	+		**2.27**
			(0.002)
Performance×D_DescendantCEO	+		**5.90**
			(0.001)
Performance×D_NonFamily	+	**1.37**	**1.38**
		(0.014)	**(0.014)**
D_FounderCEO	−	**-2.88**	**-2.90**
		(0.001)	**(0.001)**
D_DescendantCEO	−	**-3.21**	**-3.41**
		(0.001)	**(0.001)**
D_NonFamily	−	-0.73	-0.73
		(0.001)	(0.001)
CEO_age	+	0.25	0.25
		(0.001)	(0.001)
CEO_tenure	−	0.01	0.01
		(0.654)	(0.671)
Size	−	-0.16	-0.16
		(0.001)	(0.001)
N_firm	+	0.19	0.20
		(0.001)	(0.001)
Likelihood ratio		559.0	566.6
(p-value)		(0.001)	(0.001)

Table 3 Additional tests of CEO turnover–performance sensitivity (Cont'd)

Panel C The incremental impact of high family ownership

This panel reports the results of the logit regression of CEO turnover probability on performance, firm type dummies, their interactions, and control variables. The specification is similar to equation (1) in Table 2, except that we add two more firm-type dummies and their interactions with firm performance: *D_ProfessionalCEO_High* and *D_FamilyCEO_High*. *D_ProfessionalCEO_High* (*D_FamilyCEO_High*) is 1 for professional CEO family firms (Family CEO firms) in which family ownership is 25% or higher, and 0 otherwise. See Table 2 for the measurement of other variables. The sample includes 3,472 firm-years in the period 1996–1999. The p-values in parentheses are based on one-sided tests for directional predictions and are based on two-sided tests otherwise.

	Predicted signs	Estimate (p-value)
Intercept	?	-16.65
		(0.001)
Performance	−	**-3.15**
		(0.001)
Performance × D_ProfessionalCEO_High	−	**-2.56**
		(0.050)
Performance × D_FamilyCEO	+	**2.39**
		(0.002)
Performance × D_FamilyCEO_High	+	**1.78**
		(0.026)
Performance × D_NonFamily	+	**1.52**
		(0.015)
D_ProfessionalCEO_High	+	-2.75
		(0.535)
D_FamilyCEO	−	-2.18
		(0.001)
D_FamilyCEO_High	−	-1.87
		(0.001)
D_NonFamily	−	-0.68
		(0.001)
CEO_age	+	0.27
		(0.001)
CEO_tenure	−	0.00
		(0.886)
Size	−	-0.16
		(0.001)
N_firm	+	0.19
		(0.001)
Likelihood ratio		577.1
(p-value)		(0.001)

Table 4 CEO turnover–performance sensitivity: Robustness check

This table reports four sensitivity tests of the CEO turnover-performance sensitivity with additional controls (Column (1)) or using different performance measures (Columns (2), (3) and (4)). Alternative performance measures are: the average market-adjusted stock returns in the last three years (Column (2)), volatility-adjusted returns (Column (3)), and return on assets (Column (4)). The sample includes 3,472 firm-years (2,948 firm-years in Column (1)) in the period 1996-1999. The p-values (in the parentheses) are based on one-sided tests for directional predictions and on two-sided tests otherwise.

	Predicted Signs	(1) Governance measures	(2) 3-year average returns	(3) volatility-adj. returns	(4) Return on assets
Intercept	?	-15.34	-16.05	-19.17	-8.35
		(0.001)	(0.001)	(0.001)	(0.001)
Performance	−	**-2.90**	**-4.93**	**-0.20**	**-5.69**
		(0.001)	**(0.001)**	**(0.001)**	**(0.001)**
Performance ×D_FamilyCEO	+	**3.58**	**4.19**	**0.20**	**5.47**
		(0.001)	**(0.003)**	**(0.002)**	**(0.003)**
Performance ×D_NonFamily	+	**1.53**	**1.95**	**0.11**	**3.47**
		(0.008)	**(0.056)**	**(0.035)**	**(0.032)**
D_FamilyCEO	−	-3.47	-2.85	-3.23	-1.58
		(0.001)	(0.001)	(0.001)	(0.001)
D_NonFamily	−	-0.86	-0.72	-0.77	-0.68
		(0.001)	(0.003)	(0.001)	(0.001)
CEO_age	+	0.25	0.25	0.27	0.14
		(0.001)	(0.001)	(0.001)	(0.001)
CEO_tenure	−	0.03	0.01	0.00	0.00
		(0.992)	(0.224)	(0.852)	(0.995)
Size	−	-0.17	-0.13	-0.02	-0.16
		(0.001)	(0.003)	(0.645)	(0.001)
N_firm	+	0.16	0.19	0.09	0.11
		(0.002)	(0.001)	(0.074)	(0.004)
D_Board indep.	+	0.38			
		(0.040)			
Inst. Ownership	+	0.01			
		(0.009)			
D_Blockholder	+	-0.11			
		(0.732)			
G-score	−	-0.15			
		(0.001)			
Dual class	−	-0.00			
		(0.497)			
Return volatility	+			17.72	
				(0.001)	
Likelihood ratio		477.5	567.6	600.4	116.7
(p-value)		(0.001)	(0.001)	(0.001)	(0.001)
Additional tests					
Turnover-performance sensitivity for family CEO firms		0.68	-0.74	0.00	-0.22
($\alpha_1+\alpha_{1a}$)		(0.273)	(0.310)	(0.993)	(0.855)
Turnover-performance sensitivity for non-family firms		-1.37	-2.98	-0.09	-1.22
($\alpha_1+\alpha_{1b}$)		(0.001)	(0.001)	(0.001)	(0.020)
Difference in sensitivity between family CEO		2.05	2.24	0.09	2.00
and non-family firms ($\alpha_{1a}-\alpha_{1b}$)		(0.001)	(0.012)	(0.102)	(0.109)

Table 4 CEO turnover–performance sensitivity: Robustness check (Cont'd)

Notes to Table 4:
The variables are defined as follows:

Volatility-adj. returns	= annual market-adjusted stock returns scaled by return volatility;
Return on assets	= firm return on assets minus value-weighted industry return on assets;
D_Board indep.	= 1 if independent board members make up over 60% of the board, and 0 otherwise;
Inst. ownership	= percentage of outstanding shares held by institutional investors;
D_Blockholder	= 1 if there is at least one blockholder other than the founding family;
G-score	= count of anti-takeover measures developed by Gompers, Ishii, and Metrick (2003);
Dual class	= 1 if the company has dual-class share structure, and 0 otherwise;
Return volatility	= the standard deviation of monthly market-adjusted stock returns.

See the notes to Table 2 for measurement of other variables. All explanatory variables are measured in the year before CEO turnover is measured.

Table 5 Forced CEO turnover–performance sensitivity

This table reports results from the following regression:

$$\begin{aligned}\Pr(Forced\,CEO\_turnover = 1) = {} & \alpha_0 + \alpha_1 Performance \\ & + \alpha_{1a} Performance \times D\_FamilyCEO \\ & + \alpha_{1b} Performance \times D\_NonFamily \\ & + \alpha_2 D\_FamilyCEO + \alpha_3 D\_NonFamily \\ & + \alpha_4 CEO\_tenure + \alpha_5 Size + \alpha_6 N\_firm + \varepsilon,\end{aligned} \tag{1′}$$

A CEO turnover is classified as a forced turnover if the CEO is fired, demoted or forced to resign, or if the CEO is 60 or younger at the time of leaving the position. Please see Table 2 for the measurement of other variables. The sample includes 3,472 firm-years in the period 1996–1999. The p-values (in the parentheses) are based on one-sided tests for directional predictions and on two-sided tests otherwise. The last column reports the implied change in probability of CEO turnover due to a change in the corresponding variable and see Table 2 for the estimation approach.

	Predicted Signs	Estimate (p-value)	Marginal effect
Intercept	?	-1.64 (0.001)	
Performance	−	**-2.22 (0.001)**	**-10.9%**
Performance×D_FamilyCEO	+	**2.07 (0.001)**	**10.7%**
Performance×D_NonFamily	+	**1.11 (0.027)**	**8.3%**
D_FamilyCEO	−	-1.39 (0.001)	-9.8%
D_NonFamily	−	-0.84 (0.001)	-7.2%
CEO_tenure	−	-0.02 (0.090)	-0.6%
Size	−	-0.20 (0.001)	-2.5%
N_firm	+	0.32 (0.001)	4.1%
Likelihood ratio (p-value)		116.7 (0.001)	
Additional tests			
Turnover-performance sensitivity for family CEO firms ($\alpha_1+\alpha_{1a}$)		-0.15 (0.651)	-0.2%
Turnover-performance sensitivity for non-family firms ($\alpha_1+\alpha_{1b}$)		-1.11 (0.001)	-2.6%
Difference in sensitivity between family CEO and non-family firms ($\alpha_{1a}-\alpha_{1b}$)		0.96 (0.028)	2.4%

Table 6 Valuation differential across firm types

This table reports the difference in firm value across firm types from the following regression:

$$Tobin's\ Q = \alpha_0 + \alpha_1 D\_FamilyCEO + \alpha_2 D\_NonFamily + \beta\, Control\ Variables + \gamma\, Industry\ Dummies + \delta\, Year\ Dummies + \varepsilon \quad (2)$$

We report results for the poor performance period, other periods, and the full sample separately. The poor performance period refers to firm-years with market-adjusted returns falling into the bottom quartile of the sample distribution, and other periods include all other firm-years. The results for industry and year dummies are not reported for the sake of brevity. The full sample includes 2,734 firm-years in the period 1996–1999. The sample size is smaller than that in Table 2 because financial and utility companies are excluded following prior research (e.g., Anderson and Reeb, 2003). The p-values (in the parentheses) are based on one-sided tests for the coefficients on *D_FamilyCEO* and *D_NonFamily* during the poor performance period, which are predicted to be negative by H3 and H4, and are based on two-sided tests otherwise.

	(1) Poor Performance Period	(2) Other periods	(3) Full sample
Intercept	2.141	2.543	2.227
	(0.001)	(0.001)	(0.001)
D_FamilyCEO	**-0.235**	**0.118**	**0.063**
	(0.006)	**(0.330)**	**(0.504)**
D_NonFamily	**-0.151**	**-0.152**	**-0.138**
	(0.043)	**(0.191)**	**(0.132)**
Size	0.019	-0.042	-0.007
	(0.374)	(0.122)	(0.730)
Growth	1.037	1.596	1.243
	(0.001)	(0.001)	(0.001)
Return volatility	0.256	-2.288	-1.155
	(0.632)	(0.014)	(0.064)
Leverage	-0.785	-2.694	-2.143
	(0.001)	(0.001)	(0.001)
D_Board Indep.	-0.026	0.110	0.063
	(0.857)	(0.588)	(0.684)
Blockholding	-0.006	-0.012	-0.010
	(0.003)	(0.001)	(0.001)
CEO equity comp.	0.003	0.008	0.007
	(0.001)	(0.001)	(0.001)
Stock returns	1.141	1.736	1.736
	(0.001)	(0.001)	(0.001)
Number of observations	684	2,050	2,734
Adj. R^2	0.389	0.479	0.490
Additional tests:			
Difference in Tobin's Q between family CEO firms and non-family firms	-0.084	0.270	0.201
	(0.153)	(0.001)	(0.002)

Table 6 Valuation differential across firm types (Cont'd)

Notes to Table 6:
The variables are measured as follows:

Tobin's Q	= the ratio of a firm's market value of assets to its book value of assets at year-end;
D_FamilyCEO	= 1 for family firms with a member from the founding family as the CEO, and 0 otherwise;
D_NonFamily	= 1 for non-family firms, and 0 otherwise;
Size	= firm size, measured as log transformation of total assets (in millions);
Growth	= R&D/total assets;
Return volatility	= the standard deviation of monthly market-adjusted stock returns;
Leverage	= long-term debt/total assets;
D_Board indep.	= 1 if independent board members make up over 60% of the board and 0 otherwise;
Blockholding	= percentage of outstanding shares held by blockholders other than the founding family;
CEO equity comp.	= the value of the CEO's annual stock and option grants divided by total CEO pay;
Stock return	= annual market-adjusted stock return.

Table 7 Reconciliation with prior studies of family firm premium

This table reports results that reconcile firm valuation findings reported in Table 6 with those documented in prior studies. Panel A focuses on the overall family firm value premium over non-family firms, and Panel B separately examines founder premium and descendant discount. For each panel, we report results for the full sample, the poor performance period, and other periods separately. The full sample includes 2,734 firm-years in the period 1996–1999. The sample size is smaller than that in Table 2 because financial and utility companies are excluded, as in prior research (Anderson and Reeb, 2003). The poor performance period refers to firm-years with market-adjusted returns falling into the bottom quartile of the sample distribution, and other periods include all other firm-years.

Panel A Family firm premium over non-family firms

This panel reports results from the following regression:

$$Tobin's\ Q = \alpha_0 + \alpha_1 D\_FamilyFirm + \boldsymbol{\beta}\, ControlVariables + \boldsymbol{\gamma}\, IndustryDummies + \boldsymbol{\delta}\, YearDummies + \varepsilon \quad (3)$$

D_FamilyFirm is 1 for family firms, and 0 otherwise. See Table 6 for the measurement of other variables. The results for industry and year dummies are not reported for the sake of brevity. The p-values (in the parentheses) are based on two-sided tests.

	(1)	(2)	(3)
	Full sample	Poor Performance Period	Other periods
Intercept	2.092	2.012	2.384
	(0.001)	(0.001)	(0.001)
D_FamilyFirm	**0.184**	**-0.036**	**0.247**
	(0.002)	**(0.516)**	**(0.002)**
Size	-0.008	0.017	-0.042
	(0.708)	(0.440)	(0.116)
Growth	1.248	1.005	1.577
	(0.001)	(0.001)	(0.001)
Return volatility	-1.129	0.154	-2.293
	(0.070)	(0.773)	(0.013)
Leverage	-2.143	-0.788	-2.697
	(0.001)	(0.001)	(0.001)
D_Board Indep.	0.063	-0.031	0.127
	(0.686)	(0.829)	(0.530)
Blockholding	-0.010	-0.006	-0.012
	(0.001)	(0.002)	(0.001)
CEO equity comp.	0.007	0.003	0.008
	(0.001)	(0.001)	(0.001)
Stock returns	1.737	1.153	1.777
	(0.001)	(0.001)	(0.001)
Number of observations	2,734	684	2,050
Adj. R^2	0.491	0.384	0.481

Table 7 Reconciliation with prior studies of family firm premium (Cont'd)

Panel B Founder CEO premium and descendant CEO discount over non-family firms

This panel reports results from the following regression:

$$Tobin's\ Q = \alpha_0 + \alpha_1 D\_FounderCEO + \alpha_2 D\_DescendantCEO + \alpha_3 D\_ProfessionalCEO + \boldsymbol{\beta}\, ControlVariables + \boldsymbol{\gamma}\, IndustryDummies + \boldsymbol{\delta}\, YearDummies + \varepsilon \quad (4)$$

D_FounderCEO (D_DescendantCEO, D_ProfessionalCEO) is 1 for family firms run by founders (descendants, professional CEOs), and 0 otherwise. See Table 6 for the measurement of other variables. The results for industry and year dummies are not reported for the sake of brevity. The p-values (in the parentheses) are based on two-sided tests.

	(1)	(2) Poor Performance	(3)
	Full sample	Period	Other periods
Intercept	2.176	2.067	2.447
	(0.001)	(0.001)	(0.001)
D_FounderCEO	**0.279**	**-0.034**	**0.362**
	(0.001)	**(0.578)**	**(0.001)**
D_DescendantCEO	**-0.166**	**-0.373**	**-0.063**
	(0.084)	**(0.002)**	**(0.680)**
D_ProfessionalCEO	**0.113**	**0.127**	**0.134**
	(0.217)	**(0.065)**	**(0.249)**
Size	-0.010	0.015	-0.042
	(0.623)	(0.483)	(0.117)
Growth	1.208	1.007	1.537
	(0.001)	(0.001)	(0.001)
Return volatility	-1.323	0.135	-2.449
	(0.034)	(0.800)	(0.008)
Leverage	-2.162	-0.789	-2.723
	(0.001)	(0.001)	(0.001)
D_Board Indep.	0.014	-0.046	0.073
	(0.930)	(0.746)	(0.720)
Blockholding	-0.010	-0.006	-0.012
	(0.001)	(0.001)	(0.001)
CEO equity comp.	0.007	0.003	0.008
	(0.001)	(0.001)	(0.001)
Stock returns	1.732	1.170	1.766
	(0.001)	(0.001)	(0.001)
Number of observations	2,734	684	2,050
Adj. R^2	0.493	0.396	0.483

Table 8 Valuation differential across firm types: Robustness check

This table reports sensitivity tests of H3 and H4: valuation differentials across firm types after the poor performance period. The basic regression model is:

$$Tobin's\ Q = \alpha_0 + \alpha_1 D\_FamilyCEO + \alpha_2 D\_NonFamily + \beta\, Control\ Variables + \gamma\, Industry\ Dummies + \delta\, Year\ Dummies + \varepsilon \quad (2)$$

See Table 6 for variable measurement. The poor performance period refers to firm-years with market-adjusted returns (industry-adjusted return on assets) falling into the bottom quartile of the sample distribution in Columns (1) (Column (2)). In Column (1), we use lagged firm-type dummies, rather than the firm-type dummies defined for the same year as Tobin's Q. In all regressions, we include industry and year dummies; for the sake of brevity, the results for these dummies are not reported. The p-values (in the parentheses) are based on one-sided tests for the coefficients on *D_FamilyCEO* and *D_NonFamily*, which are predicted to be negative by H3 and H4, and are based on two-sided tests otherwise.

	(1) Using lagged firm-type dummies	(2) Using ROA to define the poor performance period
Intercept	1.886	1.752
	(0.001)	(0.001)
D_FamilyCEO	**-0.199**	**-0.235**
	(0.018)	**(0.004)**
D_NonFamily	**-0.120**	**-0.151**
	(0.045)	**(0.042)**
Size	0.022	0.013
	(0.307)	(0.523)
Growth	0.852	3.268
	(0.001)	(0.001)
Return volatility	0.062	-0.268
	(0.906)	(0.578)
Leverage	-0.565	-0.489
	(0.001)	(0.002)
D_Board Indep.	-0.052	-0.062
	(0.713)	(0.656)
Blockholding	-0.005	-0.006
	(0.008)	(0.001)
CEO equity comp.	0.003	0.003
	(0.001)	(0.001)
Stock return	1.061	0.255
	(0.001)	(0.368)
Number of observations	596	684
Adj. R^2	0.405	0.570