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TWO ESSAYS ON CORPORATE FINANCE

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TWO ESSAYS ON CORPORATE FINANCE

DISSERTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in the
College of Business and Economics
at the University of Kentucky

By
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Lexington, Kentucky

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ABSTRACT OF DISSERTATION

TWO ESSAYS ON CORPORATE FINANCE

This dissertation consists of two essays on corporate finance. The first essay investigates the relationship between dual-class shares and firm's risk-taking. While costs associated with dual-class shares are widely documented, the benefits are seldom studied in the literature. We attempt to fill this gap and find that dual-class firms tend to have fewer business segments, higher volatilities in their cash flows, earnings, and investment opportunities compared to propensity-matched single-class firms. Business segments within a dual-class firm are also more positively correlated in their cash flows, earnings, or investment opportunities than those in single-class firms. The results are consistent with the hypothesis that dual-class shares can potentially shield insiders from short-term market pressure so they can focus on riskier projects to enhance long-term shareholder value. To provide a possible channel through which dual-class firms can increase corporate risk-taking, we examine one of the most important corporate investment decisions: mergers and acquisitions (M&As). Dual-class firms are more likely to engage in M&As, especially nondiversifying M&As. Corporate risks increase following M&As, and the increase is more for dual-class firms than for single-class firms.

The second essay shows how CEO skills affect operating performance using a sample of 109 spin-offs from 1994 to 2009. Since a variety of studies indicate that firms in need of external financing are more likely to engage in spin-offs, we hypothesize that parent firms prefer to appoint financial experts as CEOs at spun-off units around spin-off transactions. We find that appointing spun-off unit CEOs with financial expertise brings significant and positive wealth effects. Furthermore, the CEOs with financial expertise significantly improve firms' access to capital markets and subsequent operating performance. Conversely, we do not observe positive wealth effects at the spin-off announcement or improved operating performance following spin-offs when parent firms decide to assign non-financial experts as spun-off unit CEOs.

KEYWORDS: dual class shares, risk-taking, mergers and acquisitions,
spin-off, CEO styles

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April 20, 2015

Date

TWO ESSAYS ON CORPORATE FINANCE

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April 20, 2015

I dedicate this dissertation to my family
for their constant support and unconditional love.

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Chapter One: Corporate Risk-Taking in Dual-Class Firms

1. Introduction

Agency costs associated with antitakeover provisions in general and dual-class shares in particular are widely documented in the literature. For example, Masulis, Wang, and Xie (2009) find that, in dual-class firms, as the wedge between insiders' voting rights and cash flow rights increases, corporate cash holdings are worth less, CEOs receive higher compensation, and managers make more value-destroying acquisitions. Gompers, Ishii, and Metrick (2010) find that dual-class firms trade at lower valuations than single-class firms.

However, dual-class shares, along with other antitakeover provisions, are still very prevalent in the corporate world. For example, Gompers, Ishii, and Metrick (2003) find that both the mean and median of the number of antitakeover provisions in their sample are around nine. Bebchuk, Cohen, and Wang (2013) document that about half of the over 3,000 public companies tracked by FactSet Research Systems have a staggered board. Gompers, Ishii, and Metrick (2010) report that about 6% of all Compustat firms are dual-class firms, including many prestigious corporations (e.g., Google, Nike, Comcast, and Berkshire-Hathaway).

Some studies argue that dual-class shares have their benefits. The ability of dual-class shares to shield managers from short-term market pressure so that management can focus on creating long-term value for investors has been recognized by some researchers. Stein (1988) argues that antitakeover provisions may benefit shareholders by mitigating managerial myopia because antitakeover provisions reduce a firm's exposure to takeover threats, which in turn encourage managers to undertake long-term and risky

investments. Chemmanur and Jiao (2012) argue that dual-class shares may increase long-term firm value in the hands of high ability managers, even though it may increase agency costs and destroy firm value in the hands of low ability managers. They argue that the dual-class share structure allows high ability managers to create value for the firm by investing in risky, long-term projects without worrying about losing control of the firm.

Empirically, however, very few studies have focused on the benefits of dual-class shares. We attempt to fill this gap by examining how dual-class firms differ from single-class firms in corporate risk-taking. We find that dual-class firms exhibit higher firm risks. Specifically, dual-class firms have fewer business segments than propensity-matched single-class firms. While dual-class firms on average have 1.115 segments, the propensity-matched single-class firms have an average of 1.234 segments. Dual-class firms also have higher volatilities in their cash flows, earnings, and investment opportunities, and they have higher cross-segment correlations in cash flows, earnings, and investment opportunities. These results indicate that dual-class firms tend to have higher firm risks than single-class firms.

Among dual-class firms, there are significant variations in the wedge between the percentage of voting rights controlled by insiders and the percentage of cash flow rights controlled by insiders. We find that corporate risks as measured by volatilities and cross-segment correlations in cash flows, earnings, and investment opportunities are positively related to this wedge, while the number of business segments is negatively related to the wedge, within the sample of dual-class firms. The results are consistent with the notion that dual-class shares insulate managers from short-term market pressure so that they can take greater corporate risks.

To provide a channel through which dual-class firms engage in corporate risk-taking, we examine mergers and acquisitions (M&As) in our sample period. M&As are one of the most important corporate investment decisions firms have to make, and they greatly affect firm risks. We find that dual-class firms engage in more M&As than single-class firms. Further, dual-class firms are more likely to engage in nondiversifying M&As, and less likely to engage in diversifying M&As. Because nondiversifying M&As tend to increase corporate risks more than diversifying M&As, this is consistent with the idea that dual-class firms are more likely to increase firm risks than single-class firms. We then look at changes in firm risks around M&As, and find that dual-class firms indeed have a greater change in risks than single class firms, as measured by volatilities and cross-segment correlations in cash flows, earnings, and investment opportunities.

Our study contributes to the literature in several ways. First, we provide evidence on how the dual-class share structure affects corporate investment decisions. By documenting that dual-class firms engage in more risk-taking, we show that dual-class shares may indeed be beneficial to shareholders because they allow managers to take on risky but value-increasing projects. Second, our study contributes to the literature on dual-class share structure. While existing studies on dual-class firms examine firm value (Gompers et al., 2010), managerial compensation and investment behavior (Masulis et al., 2009), mispricing of dual-class shares (Schulz and Shive, 2010), capital structure (Dey, Nikolaev, and Wang, 2009), board structure (Jiang, 2010), earnings management activities (Nguyen and Xu, 2010), corporate payout policies (Jordan, Liu, and Wu, 2014), stock issuance (Gokkaya, 2011), and short-term market pressure (Jordan, Kim, and Liu, 2015),

the benefits of dual-class shares have not been examined in depth. Our study attempts to fill this gap.

The remainder of the paper is organized as follows. We discuss the related literature in Section 2. Sample selection and some descriptive statistics are reported in Section 3. Empirical results based on dual-class and single-class firms and results within dual-class firms based on the wedge between insiders' voting rights and cash flow rights are reported in Section 4. Section 5 reports results using the M&A sample. Section 6 concludes the paper.

2. Related literature

We investigate how dual-class shares affect firms' risk-taking behavior. Naturally, our study is related to two strands of literature: studies on the dual-class share structure and studies related to firms' risk-taking behavior.

Some studies suggest that the dual-class share structure can potentially enhance shareholder value. For example, Stein (1988) argues that the dual-class share structure and other antitakeover provisions may mitigate managerial myopia. Chemmanur and Jiao (2012) argue that dual-class shares may increase long-term firm value in the hands of high ability managers. However, other studies associate dual-class share structure with lower firm values and higher agency problems (Masulis et al., 2009; Gompers et al., 2010). Bebchuk and Weisbach (2010) suggest that the main governance problem for firms with controlling shareholders (which is the case for most dual-class firms; e.g., Gompers et al., 2010, find that insiders in dual-class firms have on average 60% of voting rights) is the expropriation of wealth by controlling shareholders at the expense of minority

shareholders. Many recent studies examine how dual-class shares affect different aspects of corporate financing decisions, such as firm value (Gompers et al., 2010), managerial compensation and investment behavior (Masulis et al., 2009), mispricing of dual-class shares (Schulz and Shive, 2010), capital structure (Dey, Nikolaev, and Wang, 2009), board structure (Jiang, 2010), earnings management activities (Nguyen and Xu, 2010), corporate payout policies (Jordan, Liu, and Wu, 2014), stock issuance (Gokkaya, 2011), and short-term market pressure (Jordan, Kim, and Liu, 2015).

For corporate risk-taking, many studies investigate how managerial risk choices in investment decisions affect firm's growth and productivity. Actually, the question consists of two parts: examining the determinants of firm's risk-taking behavior and the relationship between taking risky projects and maximizing shareholder wealth.

First, for the determinants of firm's risk-taking behavior, the majority of studies look at how certain firm characteristics affect managerial risk-taking in investment decisions. Holmstron (1979) shows that increasing compensation sensitivity to firm performance reduces managers' risk-reducing activities. Coles et al. (2006) also show that a sensitivity to stock volatility in the managerial compensation (i.e. vega) is positively associated with R&D expenditures and firm leverage, which means that executives with higher vega are more likely to invest in risker assets and implement aggressive debt policy. However, Hayes et al. (2012) provide evidence that stock-based compensation does not provide incentives for risk-taking by mangers. Specifically, they show that managerial stock option schemes are mostly driven by accounting benefits based on changes in the accounting treatment of stock option under FAS 123R.

There are also studies that investigate how the ownership structure are related to corporate risk-taking. Boubakri et al. (2013) suggest that since social stability is a major priority for government policies, newly privatized firms (NPFs) owned by governments tend to have constraints on undertaking risky projects. However, NPFs mostly controlled by foreign owners are more likely to implement risky projects, resulting in increased earnings volatility. Faccio at al. (2011) show that diversified large shareholders are more likely to make firms undertake risky investment than nondiversified large shareholders, resulting in significantly increased volatility of firm-level profitability. Additionally, other studies look at the relationship between managerial traits or experience and corporate investment decisions. Faccio et al. (2014) shows that firms run by female CEOs have lower leverage and volatility in earnings than firms run by male CEO. Firms that changed a CEO from male to female experience significant reduction in corporate risk-taking. Cain and McKeon (2015) provide evidence that firms run by CEOs with private pilot's licenses, proxy for personal risk-taking, show higher equity return volatility.

Some studies examine how external governance affects firms' risk-taking behavior. John et al. (2008) investigate how risk choices in corporate investments are affected by country-level investor protection. Since investor protection as monitors of managerial behaviors weaken the pursuit of manager's private benefits, it leads to a positive relationship between investor protection and corporate risk-taking. In addition, Kim and Lu (2011) find that weak external governance measured by industry concentration ratio induces manager's risk-reducing activities, especially when CEOs have high wealth-performance sensitivity and the majority of control rights.

Second, many studies examine the relationship between undertaking risky projects and enhancing shareholder wealth. In general, these studies consider M&A activities and the number of business segments as important channels through which investment decisions can increase firms' risks (Graham, Harvey and Puri, 2014; Cain and McKeon, 2015; Coles et al, 2006). Hermalin and Katz (2000) explain that diversification decisions appear to have negative impact on shareholders wealth. This is because diversification decisions might split managers' given level of efforts among multiple projects, consequently reducing the probability that any given project will succeed. In addition, John, Litov, and Yeung (2008) suggest that the volatility of firm-level profitability has a positive impact on long-term firm growth. For acquisition activities, Malmedier and Tate (2003) suggest that overconfident or risk-seeking CEOs are more likely to execute value-destroying acquisitions. However, Cain and McKeon (2015) document that there is no evidence of value-destroying M&As led by CEOs who possess private pilot's licenses, proxy for personal risk-taking.

3. Data and key variables

In this section, we explain the process of data construction and key variables in this study and report sample distributions by year and descriptive statistics. We will also compare firm risks between dual-class and single-class firms.

3.1. Dual-class and single-class firms

To construct the sample of dual-class firms, we first identify dual-class firms from the sample used by Gompers et al (2010) and Smart and Zutter (2003). Additionally, we supplement the sample by hand-collecting dual-class firms as follows. If a firm has more

than 5% difference in its number of shares outstanding in Compustat and CRSP, we consider it a potential dual-class firm because Compustat reports the number of shares in all share classes, whereas CRSP reports the number of shares of a specific class of common stock. Next, we look at the firm's annual financial statement (Form-10K) to confirm whether the firm is actually a dual-class firm. Additionally, we exclude 19 cases of dual-class recapitalization that changes from single-class to dual-class structure and 105 cases of share unification that eliminates dual-class shares and merges into single-class shares during our sample period from 1994 to 2011. We exclude financial firms (SIC codes 6000 – 6999) and utility firms (SIC code 4900 – 4999) from our sample.

In order to address potential endogeneity concerns, we use a propensity score matching method to find a matching single-class firm for each dual-class firm. We estimate the following logistic model for all dual- and single-class firms in the IPO year (Dey et al.,2009; Gompers et al., 2012):

$$Prob(Dual=1)=\alpha_0+\beta_1 Name+\beta_2 Media+\beta_3 StateLaw+\beta_4 SalesRank+ \beta_5 ProfitRank+\beta_6 \%Firms+\beta_7 \%Sales+\beta_8 \%RegionSales+ \beta_9 Lgsz+IndustryDummies+IPOYearDummies+\mu_{it}. \quad (1)$$

Dual is equal to 1 if firm *i* is a dual-class firm at IPO; 0 otherwise. *Name* is a dummy variable with value 1 if the firm's name at IPO contains a person's name; 0 otherwise. *Media* equals 1 if the firm is a media company, and 0 otherwise.[1] *StateLaw* is the state law antitakeover index from Gompers, Ishii, and Metrick (2003). *SalesRank* is the percentile ranking of the IPO-year sales of the firm relative to other firms with the same IPO year. *ProfitRank* is the percentile ranking of the IPO-year profits of the firm relative to other

[1] Media companies have SIC codes 2710-11, 2720-21, 2730-31, 4860, 4832-33, 4840-41, 7810, or 7820.

firms with the same IPO year. *%Firms* is the percentage of all Compustat firms located in the same metropolitan or metropolitan statistical area (MSA) as firm *i* in the year before the firm's IPO. *%Sales* is the percentage of sales from firms in the same MSA as firm *i* in the year before the firm's IPO. *%RegionSales* is the ratio of firm *i*'s sales to the sales of all firms in the same MSA. *Lgsz* is the log of the firm's total assets.

In Table 1.1, we present the number of dual-class, unmatched single-class, and propensity-matched single-class firms during the period of 1994 to 2011. An average of 215 dual-class firms exist during the period with a maximum of 285 firms in 1997 and a minimum of 159 firms in 2011. Although it appears to show a decreased number of dual-class firms after 2000, the proportion of dual-class to single-class firms is quite consistent throughout the period at around 12%. Additionally, our sample contains only about 25% of single-class firms in Compustat due to segment, correlation, and volatility measurement restrictions, as we will explain in sections 3.2 and 3.3.

3.2. Segment and mergers and acquisitions (M&As) information

We use the number of segments as one measure of corporate risk-taking behavior. For firms' segment information, we use Compustat's segment files, specifically focusing on firm's business segments and using only the latest source year of each segment-year observation. We then filter the sample by dropping the following firms; (i) firms with missing sales or SIC codes in at least one segment, (ii) firms with at least one segment operating in the financial (SIC codes of 6000-6999) or utility sector (SIC codes 4900-4999), and (iii) firms with market capitalizations less than $10 million. We also exclude firms if the sum of segment sales differs 1% or more from the total net sales of the firm (Berger and Ofek, 1995). After imposing the restrictions on the segment data, a firm is

defined as a single-segment firm if it has only one segment and a multi-segment firm otherwise. For the industry definitions, we use 4-digit SIC codes and require each industry to have at least five single-segment firms and each firm in the industry to have at least $10 million in sales over the last 10 years. (Amit, 2013; Jordan, Liu and Wu, 2015).

To investigate the difference in corporate risk-taking between dual- and single-class firms, we also examine how dual-class firms' mergers and acquisitions (M&As) activities differ from single-class firms. We use the Securities Data Company's (SDC) U.S. Mergers and Acquisitions Database to construct a sample of M&As. We use domestic M&As where a U.S public firm acquires a U.S public target with execution dates between 1994 and 2011. In addition, we exclude M&A deals that acquiring firms owned more than 50% of the target's stock prior to the acquisitions or own less than 50% after the acquisition. We further require the minimum deal value of the acquisition to be $10 million in constant 2007 dollars. An acquisition is defined as a diversifying M&A if the acquirer and the target have different 4-digit SIC codes; otherwise, it is defined as a nondiversifying M&A.

3.3. Measures of firm risks

To measure the outcomes of corporate risk-taking behavior, we construct several variables: volatilities and cross-segment correlations in investment opportunities, cash flows, and earnings. Investment opportunity is measured by Tobin's Q, cash flow is the ratio of earnings less interest and taxes to assets, and earnings is the earnings per share (EPS) from Compustat.

To measure cross-segment correlations and volatilities, we rely on annual average of Tobin's Q, cash flow, and earnings across all single-segment firms based on 4-digit SIC codes. Additionally, we require at least five years of non-missing data in Q, cash flow, and

earnings over the past 10 years. For the cross-segment correlation of investment opportunities, we estimate a pair-wise correlation between all segments using prior 10-year average industry Tobin's Q based on single-segment firms in the industry as follows (Jordan, Liu, and Wu, 2015):

$$Q\ Corr = \sum_{p=1}^{n} \sum_{q=1}^{n} w_{ip(j)}\, w_{iq(k)} Corr_{[t-10,t-1]}(j,k) \qquad (2)$$

where $w_{ip(j)}$ is the sales share of segment p of firm i operating in industry j, $w_{iq(k)}$ is the sales share of segment q of firm i operating in industry k, and $Corr_{[t-10,t-1]}(j,k)$ is the estimated correlation of Tobin's Q between industries j and k over the past ten years. The Correlation in cash flow and earnings are constructed similarly, except that we use cash flow and earnings instead of Tobin's Q. For pure play firms, correlations are 1 since the firm has only one segment so all Q, cash flows, and earnings are in the same industry by definition. Next, to define the volatility in investment opportunity, we follow Duchin (2010) and estimate the following measure for all firms in our sample:

$$\sigma(Q)_{t,k} = \sqrt{\sum_{i=1}^{N} \sum_{j=1}^{N} w_i w_j \rho(Q)_{i,j} \sigma(Q)^{i}_{t,k} \sigma(Q)^{j}_{t,k}} \qquad (3)$$

where $\sigma(Q)^{i}$ denotes the standard deviation of Tobin's Q of segment i and $\rho(Q)_{i,j}$ is the correlation of Tobin's Q between industries to which segments i and j belong.

3.4. Univariate tests of firm risks between dual-class and single-class firms

We hypothesize that dual-class firms take more risks in their firms' operation than single-class firms. This is because dual-class share structures insulate managers from short-term market pressure (Jordan, Kim, and Liu, 2015). Thus, we expect dual-class firms to take on more firm risk and operate in one or two lines of business instead of many different sectors. That is, we expect dual-class firms to have fewer business segments than single-class firms. Consequently, we expect dual-class firms to have higher correlations and

volatilities in Tobin's Q, cash flows, and earnings than single-class firms. In Table 1.2, we compare the mean difference in these measures of corporate risk between dual-class and single-class firms.

Results in Table 1.2 support our hypothesis that dual-class firms take more risks than single-class firms. Dual-class firms have fewer segments than single-class firms. The average number of segments for dual-class firms is 1.115, while that that for single-class firms is 1.209, and the difference is statistically significant at the 1% level. Because the number of segments for a firm is highly correlated over time for the same firm, we first calculate the difference in the average number of segments between dual- and single-class firms, and then calculate the average difference over time and the associated t-values based on Newey-West standard errors with one-year lag.[2] We calculate the statistical significance in other measures of corporate risk-taking similarly. The correlations and volatilities of Tobin's Q, cash flows, and earnings are all higher for dual-class firms than for single-class firms.

In the right three columns in Table 1.2, we compare measures of corporate risks between dual-class and propensity-matched single-class firms. We find similar results as in the first three columns. Dual-class firms have fewer number of segments, and higher values of correlations and volatilities in Tobin's Q, cash flow, and earnings than single-class firms.

3.5. Comparison of firm characteristics between dual- and single-class firms

Univariate tests in Table 1.2 shows that dual-class firms appear to have higher corporate risks than single-class firms. However, it is plausible that factors other than the

[2] Results are unchanged if we use two or three years lag.

dual-class share structure also affect corporate risk-taking. Thus, we control firms' other characteristics on multi-variate regression models in later sections to see whether dual-class shares per se actually affect firm risks. For example, we control for firm size measured as the firm's market capitalization of equity because young and small firms tend to have fewer number of segments and higher correlations and volatilities than large and mature firms.[3] We also control for the book-to-market ratio of the firm because firms with low book-to-market ratios tend to show similar tendencies with small firms. Other firm characteristics are stock returns, leverage, dividends, and the number of shares that are commonly used in previous studies (see Appendix for details). Table 1.3 describes the various variables employed as control variables in this study.

Difference (1) in Table 1.3 shows that dual-class firms differ significantly from single-class firms in Compustat in many dimensions. Specifically, single-class firms are significantly smaller than dual-class firms in market capitalization and total assets. The average market capitalization is $1,303.78 million and $851.23 million for dual-class and single-class firms, respectively. Dual-class firms tend to have higher leverage, are more likely to pay dividends, and have higher ROA. The number of shareholders for dual-class firms (7.6 thousand) is significantly lower than single-class firms (31.38 thousand), likely because many of the super-voting shares of dual-class firms are untradeable or illiquid. Difference (2) in Table 1.3 compares dual-class and propensity-matched single-class firms. In general, the descriptive statistics in Table 1.3 are similar to those in previous studies

[3] For dual-class firms with non-tradeable super-voting shares, we do not have a market price for super-voting shares. The market value of equity for these firms is defined as the price of the inferior-voting shares multiplied by the total number of shares outstanding (i.e. the sum of the number of inferior-voting shares and super-voting shares). The market value of equity for other dual-class firms is the sum of the market value of inferior-voting shares and the market value of superior-voting shares.

(e.g., Jordan, Kim, and Liu, 2015) although we drop more than 70% of single-class firms in Compustat due to sample restrictions, as explained in section 3.2 and 3.3.

4. Results based on dual-class and single-class firms

To investigate dual-class firms' risk-taking behavior, this section shows regression results of how dual-class shares affect the number of segments and correlation and volatility in Q, cash flow, and earnings, after controlling for other variables described in section 3.5. In addition, we explore how the wedge between insiders' voting rights and cash flow rights affects dual-class firms' risk-taking behavior.

4.1. Results based on dual-class and single-class firms

To estimate the effect of dual-class share structure on corporate risk-taking, we use multi-variate regression models and present results in Table 1.4. Specifically, Panel A of Table 1.4 reports regression results on how the number of segments and correlations and volatilities of Q, cash flow, and earnings are related to the dual-class share structure based on the sample of dual-class and single-class firms from Compustat. After controlling all other factors that may affect firm's risk-taking behavior, coefficients on the dual-class dummy in all seven models are statistically significance at the 1% level. The results indicates that dual-class firms tend to have fewer number of segments and higher correlations and volatilities than single-class firms.

For example, the coefficient for the dual-class dummy is -0.119 in model (1). The coefficient indicates that for dual-class firms we expect the number of segments to be fewer by an average of 0.119 than single-class firms. Additionally, the coefficient for the dual-class dummy is 3.67 dollars in model (7), which means that on average, earnings volatility

of dual-class firms is 3.67 dollars higher compared to single-class firms. The results in Panel B are qualitatively similar based on dual-class and propensity-matched single-class firms.

4.2. Results based on dual-class firms only

To provide further evidence in support of our hypothesis that dual-class firms are able to take on more risky projects because insiders in these firms are insulated from short-term market pressures, we also identify situations where there are significant differences between voting rights and cash flow rights within firms with dual-class shares. For the within sample tests, our variable of interest is the wedge variable (*VOratio*). We follow previous studies (e.g., Harvey, Lins, and Roper, 2004; Masulis et al., 2009) and define *VOratio* as the ratio of the percentage of a firm's voting rights controlled by insiders to the percentage of cash flow rights controlled by insiders. Because the higher the value of the wedge variable, the more insulated insiders are from short-term market pressure and thus can choose risky projects among efficient investment opportunities, we expect *VOratio* to be negatively related to the firm's number of segments and positively related to correlation and volatility in Q, cash flow, and earnings.

Table 1.5 shows the results that the effect of *VOratio* on the number of segments is negative and statistically significant at the 1% level (model (1)). We also observe a positive effect of *VOratio* on correlations and volatilities in all six measures and the effect is statistically significant at the 0.01 or 0.05 level in model (2) through (7).

5. A possible mechanism of corporate risk-taking: mergers and acquisitions (M&As)

So far, our results support the hypothesis that dual-class firms tend to take on more corporate risks, resulting in fewer number of segments and higher volatility and cross-segment correlation in Q, cash flows, and earnings than single-class firms. In this section, we provide further evidence for our hypothesis using the M&A sample. M&As are one of the most important investment decisions made by firms. Our previous results show that dual-class firms have higher risks than single-class firms. The M&A sample can potentially provide a mechanism through which dual-class firms tend to have higher risks: they may make more M&As and take on riskier M&As than single-class firms.

5.1. Univariate tests of the frequency of M&As

Panel A in Table 1.6 reports a time profile of the number of M&As for dual-class and single-class firms by year during the sample period 1994 -2011. Further, each acquisition is defined as a diversifying M&A if the acquirer and the target have the same 4-digit SIC code; otherwise, it is defined as a nondiversifying M&A. For dual-class firms, the number of M&As varies during the sample period: a low of 15 in 2010 and a high of 67 in 1999. The number of acquisitions for single-class firms appears to show similar patterns with dual-class firms.

Since Panel A consists of dual-class and all Compustat single-class firms, the total number of M&As for dual-class firms is significantly fewer (664 versus 9343). However, if we look at the proportion of nondiversifying and diversifying M&As to the total number of acquisition activities, dual-class firms tend to have more nondiversifying and less diversifying acquisitions than single-class firms. This tendency is clearly shown in Panel B based on dual-class and propensity-matched single-class firms. For example, dual-class

firms have 516 M&As and the propensity-matched single-class firms have 390 M&As. In addition, 63 % of dual-class firms' acquisitions are classified as nondiversifying M&As, whereas single-class firms have 48% of nondiversifying M&As. To investigate whether this finding is also statistically significant across all years, we have univariate tests in Table 1.7.

In Table 1.7, we compare the probability of M&As between dual-class and single-class firms. We also examine the probability of nondiversifying and diversifying M&As between dual-class and single-class firms. The sample in Table 1.7 consists of dual-class and single-class firms regardless of whether or not firms have M&A activities. Specifically, the probability of M&As is the ratio of the total number of M&As to the total number of dual-class or single-class firms in a given year. In addition, the probability of nondiversifying (diversifying) M&As is the ratio of the total number of nondiversifying (diversifying) M&As to the total number of dual-class or single-class firms' M&A activities. Diversifying and nondiversifying M&As are classified based on acquiring and target firms' 4, 3, and 2-digit SIC code. Difference (1) and (2) show the difference between dual-class and single-class firms and between dual-class and propensity-matched single-class firms, respectively.

In difference (1), dual-class firms have an average 11.5% chance of engage in an M&A in a given year while single-class firms in Compustat have an average chance of 7.2%. The difference is statistically significant at the 1% level. At the same time, dual-class firms are more likely to make nondiversifying acquisitions than single-class firms across all industry classifications based on 4-, 3-, or 2- digit SIC codes. For example, based on 4-digit SIC codes classification, 47.3% of dual-class firms' acquisitions are

nondiversifying M&As, significantly higher by 13% than single-class firms' nondiversifying M&As. Difference (2) in Table 1.7 also shows that dual-class firms have significantly higher probability of M&A activities and are more likely to have nondiversifying acquisitions than propensity-matched single-class firms. In summary, the finding in Table 1.7 supports our hypothesis that dual-class firms appear to be more likely to engage in nondiversifying M&As and less likely to engage in diversifying M&As than single-class firms.

5.2. Logit regression analysis of M&As

The univariate tests in Table 1.7 show that dual-class firms tend to have significantly fewer number of diversifying and greater number of nondiversifying acquisitions than single-class firms. At the same time, the total number of M&As for dual-class firms is significantly greater than single-class firms. This finding is consistent with our hypothesis that dual-class firms have a strong tendency to take risky projects in general. However, there are many other factors that may affect the firm's risk-taking behavior, and we want to test whether dual-class shares still affect a firm's M&A decision, especially a diversifying or a nondiversifying acquisition after controlling for other factors: firm size, book-to-market ratio, leverage, dividend, turnover, and stock returns (see Appendix for details).

In Table 1.8, we run logit models, with the M&A dummy as the dependent variable, which takes value 1 if a firm completes an M&A in year t and 0 otherwise. In addition, we have two more dependent variables as nondiversifying and diversifying M&A dummy. The sample includes dual-class and all single-class firms in models (1)-(3) and dual-class and propensity-matched single-class firms in models (4)-(6). Since use panel data, we use

standard errors clustered at the firm level and at the year level (2-way clustering). We also include the year dummies to capture the year fixed effects. Table 1.8 shows that after controlling for firm size, book-to-market ratio, 1-year prior stock return, leverage, dividend, and stock turnover, the dual-class firms are more likely to engage in M&As. At the same time, acquisitions made by dual-class firms are more likely to be non-diversified. This is true whether we look at dual-class and single-class firms or dual-class and propensity-matched single-class firms.

5.3. Changes in firm risks around M&As

We show that dual-class firms have higher frequency of M&A activities than single-class firms. In addition, the acquisitions of dual-class firms are more likely to be nondiversifying acquisitions. Our interpretation for this finding is that insiders of dual-class firms are more willing to take risky projects because they are insulated from short-term market pressure. So, if our hypothesis is correct, then we expect dual-class firms' number of segment to increase less and correlations and volatilities to increase more than single-class firms after mergers and acquisitions. Thus, in this section, we compare the change in the number of segments and correlation and volatility in Q, cash flow and earnings between dual- and single-class firms. Specifically, we measure changes as differences in the value eight quarters (i.e. two years) before M&As and the value eight quarters (i.e. two years) after M&As.

Table 1.9 presents the results of how changes in the number of segments, correlations, and volatilities differ around M&A between dual-class and single-class firms in difference (1) and between dual-class and matching single-class firms in difference (2). After acquisitions, the number of segments for dual-class firms increases by 0.09, while

the number of single-class firms increases by 0.30 and the difference (-0.21) is statistically significant at the 0.01 level. These results are in line with our previous finding that dual-class firms are more likely to have nondiversifying M&As. Additionally, single-class firms' negative changes in correlation and volatility in Q, cash flow, and earnings support our previous finding that single-class firms are more likely to have diversifying acquisitions (i.e. less risky projects), resulting in increased number of segments after acquisitions. For example, while earnings volatility for single-class firms decreases by an average of 27.80 dollars, dual-class firms' earnings volatility increases by an average of 23.52 dollars after M&As.

5.4. Regression analyses explaining changes in firm risks around M&As

To estimate the causal effect, we perform regression of changes in the number of segments, correlations and volatilities on dual-class share structure, using the sample of dual-class and single-class firms that completed mergers and acquisitions during the period of 1994-2011. Specifically, Panel A and B in Table 1.10 include the sample of dual-class and single-class firms and dual-class and propensity-matched single-class firms, respectively. In regression models, dependent variables are differences between an average of the number of segments, correlations and volatilities in eight quarters (i.e. two years) before and after M&As. We also use the ratio of a target firm's market value to an acquirer's market value (i.e. relative size) as one of control variables. Other control variables are the same as those we used in previous regression models.

Across all samples in Panels A and B, coefficients on dual-class share dummy are negative in model (1) and statistically significant, suggesting that dual-class firms are more likely to engage in nondiversifying acquisitions. The negative coefficient on the dual-class

dummy in model (1) does not mean that the number of segments for dual-class firms actually decreases after acquisitions. It means that single-class firms have a relatively high proportion of diversifying M&As compared to dual-class firms as shown in Table 1.9 (that is, the number of segments increase less compared to single-class firm M&As). Additionally, we also see positive and statistically significant coefficient on the dual-class shares in models (1) – (7) in both Panels A and B. These results indicate that after M&As, dual-class firms experience a significantly increased correlation and volatilities in investment opportunity, cash flow, and earnings.

6. Conclusion

While costs associated with dual-class shares are widely documented, the benefits are seldom studied in the literature. We attempt to fill this gap and find that dual-class firms tend to have fewer business segments, higher volatilities in their cash flows, earnings, and investment opportunities compared to propensity-matched single-class firms. Business segments within the firm are also more positively correlated in their cash flows, earnings, or investment opportunities. The results are consistent with the hypothesis that dual-class share can potentially shield insiders from short-term market pressure so that they can focus on riskier projects to enhance long-term shareholder value. To address endogeneity concerns and to provide a possible channel through which dual-class firms can increase corporate risk-taking, we examine one of the most important corporate investment decisions: mergers and acquisitions (M&As). Dual-class firms are more likely to engage in M&As, especially nondiversifying M&As. Corporate risks increase following M&As, and the increase is more for dual-class firms than for single-class firms.

Table 1.1: Distribution of dual-class and single-class firms by year

This table presents the number of dual-class and single-class firms during our sample period from 1994 to 2011 in Compustat. The sample firms with dual-class shares are collected from Gompers et al. (2010), Smart and Zutter (2003), and firms' annual financial reports (Form 10-K). The third and last columns report the number of all Compustat single-class firms and the number of propensity-matched single-class firms, respectively. We restrict single-class firms based on segments, correlation, and volatility measurement explained in section 3. In addition, we find a matching single-class firm for each dual-class firm based on a propensity score matching method, similar to Armstrong et al. (2010), Dey et al. (2009) and Gompers et al. (2010).

Year	Number of dual-class firms	Number of single-class firms	%	Number of propensity-matched single-class firms
1994	218	1,982	0.11	209
1995	251	2,039	0.12	209
1996	277	2,146	0.13	202
1997	285	2,227	0.13	227
1998	277	2,135	0.13	234
1999	265	1,808	0.15	225
2000	260	1,675	0.16	245
2001	230	1,673	0.14	200
2002	211	1,654	0.13	198
2003	203	1,671	0.12	186
2004	198	1,673	0.12	179
2005	188	1,623	0.12	184
2006	182	1,516	0.12	175
2007	172	1,393	0.12	165
2008	166	1,332	0.12	146
2009	161	1,288	0.13	153
2010	162	1,255	0.13	148
2011	159	1,200	0.13	145
Total	3,865	30,290	0.13	3,430

Table 1.2: Univariate test between dual-class and single-class firms

This table reports the difference in the number of segments and volatility and cross-segment correlation in Tobin's Q, cash flow, and earnings between dual-class and single-class firms. Additionally, the last column shows differences between dual-class and propensity-matched single-class firms. We calculate the difference in each year and then report the average difference over time and the associated *t*-values based on Newey-West standard errors with one year lag. Asterisks indicate significance at the 0.01(***), 0.05(**), and 0.01(*) levels. All variables are described in detail in the appendix.

	Dual- and single- class firms			Dual- and propensity-matched single-class firms		
	Dual-class firms	Single-class firms	Difference (1)	Dual-class firms	Single-class firms	Difference (2)
Number of segments	1.115	1.209	-0.094***	1.115	1.234	-0.119***
			[-8.81]			[-7.18]
Q correlation	0.989	0.984	0.005***	0.989	0.985	0.004*
			[3.14]			[1.93]
Q volatility	0.588	0.497	0.090***	0.588	0.454	0.134***
			[13.26]			[14.35]
Cash flow correlation	0.988	0.981	0.007***	0.988	0.980	0.008***
			[4.32]			[3.32]
Cash flow volatility	0.241	0.150	0.090***	0.241	0.153	0.088**
			[3.44]			[2.02]
Earnings correlation	0.985	0.978	0.007***	0.985	0.974	0.011***
			[3.82]			[3.17]
Earnings volatility	6.225	2.213	4.011***	6.225	2.649	3.576***
			[26.69]			[10.87]

Table 1.3: Summary statistics

This table compares firm characteristics between dual-class and single-class firms for 1994 to 2011. Dollar values are expressed in 2007 dollars. Variables are measured at the end of the fiscal year. *Total assets* is the fiscal year-end total assets. *Firm size* is calculated by multiplying the shares outstanding by the closing price at the end of fiscal year. *StockReturn* is the cumulative stock return over the last 12 months. *Leverage* is the ratio of book value of total debt to book value of total assets. *Turnover* is the average of monthly ratios of the number of shares traded to the number of shares outstanding during the last 12 months. *Return on assets* (ROA) is the ratio of earnings before interest, taxes, depreciation, and amortization to the book value of total assets. *Dividend* equals 1 if the firm pays dividends and 0 otherwise. In tests for differences, we first calculate the difference each year and then report the average over time and the associated *t*-values based on Newey-West standard errors with one year lag. Statistical significance at the 1%, 5%, and 10% levels are indicated by ***, **, and *, respectively. All variables are described in detail in the appendix.

	Dual- and single-class firms			Dual- and propensity-matched single-class firms		
	Dual-class firms	Single-class firms	Difference (1)	Dual-class firms	Single-class firms	Difference (2)
Total assets (millions of dollars)	1,303.783	851.226	452.557***	1,177.834	997.190	180.644**
Size (millions of dollars)	1,250.927	855.627	395.300***	1,121.883	950.443	171.441**
Book-to-market	0.737	0.720	0.017***	0.748	0.733	0.014
Stock return	0.184	0.179	0.005	0.179	0.187	-0.008
Leverage	0.281	0.249	0.033***	0.250	0.254	-0.004
Dividends (dummy)	0.516	0.339	0.176***	0.504	0.365	0.139**
Turnover	0.116	0.233	-0.117***	0.121	0.232	-0.111*
Number of shareholders (thousands)	7.629	31.378	-23.749***	6.617	44.632	-38.015*

Table 1.4: Regression analyses on dual-class firms

This table shows regression results of the number of segments and correlation and volatility in Tobin's Q, cash flow, and earnings on dual class share and company characteristics. Panel A and B include dual-class and all single-class firms and dual-class and propensity-matched single class firms, respectively. The number of segments for each firm is the number of business segments from Compustat's industry segment files for 1994 to 2011. Volatility is the volatility of firm-level Q, cash flow, and earnings over the past 10 years (Duchin, 2010). Correlation is a sales-weighted portfolio correlation in Q, cash flow, and earnings for multi-segment firms (Hann et al., 2013). Each of correlation in Q, cash flow, and earnings is one for single-segment firms. Cash flow is the ratio of cash flow to total assets and earnings is the earnings per share (EPS) in Compustat. Dual class share is a dummy variable equal to one if a firm has a dual class share structure and zero otherwise. Each regression includes the year fixed effects and the standard errors are clustered at firm-year level. Asterisks indicate significance at the 0.01(***), 0.05(**), and 0.01(*) levels. All control variables are described in detail in the appendix.

Panel A: Dual-class and all single-class firms

	(1) Number of segments	(2) Q correlation	(3) Q volatility	(4) Cash flow correlation	(5) Cash flow volatility	(6) Earnings correlation	(7) Earnings volatility
Dual class share	-0.119***	0.008***	0.139***	0.010***	0.119***	0.010**	3.672***
(dummy)	[-4.60]	[2.65]	[12.34]	[2.91]	[5.05]	[2.48]	[5.60]
ln(Firm size)	0.024***	-0.001**	-0.012***	-0.001**	-0.021***	-0.002**	0.480***
	[4.52]	[-2.41]	[-4.04]	[-2.17]	[-3.27]	[-2.23]	[8.40]
Book-to-market	-0.109***	0.007***	-0.419***	0.010***	-0.076	0.007**	2.010***
	[-4.36]	[3.05]	[-20.49]	[3.99]	[-1.64]	[2.06]	[5.34]
Leverage	-0.049**	0.003	-0.139***	0.005*	0.045	0.004	1.683***
	[-2.22]	[1.35]	[-4.91]	[1.78]	[1.18]	[1.54]	[3.70]
Dividends	0.008	-0.005**	-0.134***	-0.003*	-0.045**	-0.004*	-0.180
(dummy)	[0.56]	[-2.50]	[-11.36]	[-1.84]	[-2.25]	[-1.95]	[-0.80]
Turnover	-0.049*	0.010***	0.037**	0.010***	0.034	0.009***	1.463***
	[-1.79]	[3.23]	[2.05]	[2.94]	[0.92]	[2.66]	[3.71]
Stock returns	0.004	-0.001	0.004	-0.001*	-0.006***	-0.001*	-0.128**
	[0.57]	[-1.59]	[0.69]	[-1.91]	[-3.26]	[-1.65]	[-2.29]
Observations	34,155	34,155	34,155	34,155	34,155	34,155	34,155
Adjusted R-squared	0.023	0.012	0.178	0.015	0.004	0.014	0.037
Intercept/ Year fixed effect	YES	YES	YES	YES	YES	YES	YES
Cluster	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year

Panel B: Dual-class and propensity-matched single-class firms

	(1) Number of segments	(2) Q correlation	(3) Q volatility	(4) Cash flow correlation	(5) Cash flow volatility	(6) Earnings correlation	(7) Earnings volatility
Dual class share	-0.109***	0.008***	0.147***	0.011***	0.084*	0.012**	2.963***
(dummy)	[-3.47]	[3.46]	[9.58]	[4.38]	[1.80]	[2.29]	[5.84]
ln(Firm size)	0.025***	-0.002***	-0.007	-0.002**	-0.013	-0.002	0.541***
	[2.67]	[-3.00]	[-1.55]	[-2.29]	[-0.91]	[-1.01]	[3.47]
Book-to-market	-0.060*	0.000	-0.267***	0.001	-0.098	-0.000	1.855**
	[-1.69]	[0.14]	[-11.15]	[0.32]	[-1.08]	[-0.01]	[2.42]
Leverage	-0.037	0.001	-0.162***	0.002	0.056	0.009	3.028***
	[-0.90]	[0.35]	[-7.03]	[0.58]	[0.52]	[1.08]	[2.83]
Dividends	0.001	-0.001	-0.097***	0.001	0.002	0.001	-0.132
(dummy)	[0.06]	[-0.34]	[-9.26]	[0.43]	[0.03]	[0.30]	[-0.34]
Turnover	0.010	0.009**	0.015	0.008*	0.043	0.007	0.953
	[0.15]	[2.03]	[0.75]	[1.93]	[0.64]	[1.13]	[1.37]
Stock returns	0.010	-0.001	-0.000	-0.002	-0.004	-0.001	-0.130
	[1.40]	[-1.28]	[-0.17]	[-1.62]	[-0.95]	[-1.42]	[-1.39]
Observations	6,860	6,860	6,860	6,860	6,860	6,860	6,860
Adjusted R-squared	0.025	0.010	0.170	0.012	0.003	0.013	0.033
Intercept/ Year fixed effect	YES	YES	YES	YES	YES	YES	YES
Cluster	Firm & Year	Firm &Year	Firm &Year	Firm & Year	Firm & Year	Firm & Year	Firm &Year

Table 1.5: Regression analyses on wedge between insiders' voting rights and cash flow rights

This table shows regressions of the number of segments and correlation and volatility in Q, cash flow, and earnings on dual-class firms' wedges in voting rights and cash flow rights. The wedge variable (VOratio) is the ratio of the percentage of insiders' voting rights to the percentage of insiders' cash flow rights at dual-class firms (Harvey et al., 2004; Masulis et al., 2009). The number of segments for each firm is the number of business segments from Compustat's industry segment files for 1994 to 2011. Volatility is the volatility of firm-level Q, cash flow, and earnings over the past 10 years (Duchin, 2010). Correlation is a sales-weighted portfolio correlation in Q, cash flow, and earnings for multi-segment firms (Hann et al., 2013). Each of correlation in Q, cash flow, and earnings is one for single-segment firms. Cash flow is the ratio of cash flow to total assets and earnings is the earnings per share (EPS) in Compustat. Each regression includes the year fixed effects and the standard errors are clustered at firm-year level. Asterisks indicate significance at the 0.01(***), 0.05(**), and 0.01(*) levels. All control variables are described in detail in the appendix.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Number of segments	Q correlation	Q volatility	Cash flow correlation	Cash flow volatility	Earnings correlation	Earnings volatility
VOratio	-0.026***	0.002***	0.040**	0.002***	0.037**	0.003***	0.473**
	[-3.45]	[2.95]	[2.04]	[2.63]	[2.07]	[3.70]	[2.35]
ln(Firm size)	0.037***	-0.004***	0.009*	-0.004***	0.003	-0.005***	1.073***
	[3.32]	[-2.71]	[1.86]	[-2.63]	[1.02]	[-2.66]	[2.81]
Book-to-market	0.025	-0.003	-0.103***	-0.005	-0.030*	-0.003	2.415
	[0.40]	[-0.68]	[-4.80]	[-1.01]	[-1.91]	[-0.46]	[1.15]
Leverage	-0.029	0.001	-0.096***	0.000	0.008	-0.004	4.171
	[-0.50]	[0.23]	[-3.69]	[0.04]	[0.44]	[-0.46]	[1.50]
Dividends	-0.001	-0.001	-0.038***	0.002	-0.021*	-0.002	-1.312*
(dummy)	[-0.02]	[-0.39]	[-2.92]	[0.40]	[-1.82]	[-0.51]	[-1.66]
Turnover	0.088	0.009	0.003	0.008	0.004	0.011	0.995
	[1.53]	[1.19]	[0.13]	[1.12]	[0.33]	[1.19]	[0.72]
Stock returns	0.007	-0.002	0.002	-0.002	0.001	-0.002	-0.213
	[0.99]	[-1.32]	[1.08]	[-1.20]	[0.78]	[-1.26]	[-1.37]
Observations	3,865	3,865	3,865	3,865	3,865	3,865	3,865
Adjusted R-squared	0.011	0.022	0.081	0.018	0.034	0.021	0.011
Intercept/ Year fixed effect	YES	YES	YES	YES	YES	YES	YES
Cluster	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year

Table 1.6: Distribution of mergers and acquisitions (M&As) by year

This table reports the distribution of the number of M&As by year for the period 1994 to 2011. The M&As sample consists of all completed mergers by U.S. public companies recorded in the SDC Mergers and Acquisition database between January 1994 to December 2011. Panel A and B include dual-class and all single-class firms and dual-class and propensity-matched single-class firms, respectively. Specifically, each firm's M&A is classified as nondiversifying and diversifying M&As. Nondiversifying M&As are when an acquiring and a target firm are in the same industry based on 4-digit SIC code. If a target and an acquiring firm's 4-digit SIC codes are different, then it is defined as diversifying M&As.

Panel A: Dual-class and all single-class firms

	Dual-class firms					Single-class firms				
Year	Number of M&As	Nondiversifying M&As	%	Diversifying M&As	%	Number of M&As	Nondiversifying M&As	%	Diversifying M&As	%
1994	16	12	0.75	4	0.25	303	156	0.51	147	0.49
1995	34	24	0.71	10	0.29	425	246	0.58	179	0.42
1996	48	39	0.81	9	0.19	612	308	0.50	304	0.50
1997	54	36	0.67	18	0.33	718	370	0.52	348	0.48
1998	63	46	0.73	17	0.27	842	411	0.49	431	0.51
1999	67	41	0.61	26	0.39	782	391	0.50	391	0.50
2000	57	42	0.74	15	0.26	777	389	0.50	388	0.50
2001	38	28	0.74	10	0.26	510	248	0.49	262	0.51
2002	45	31	0.69	14	0.31	459	250	0.54	209	0.46
2003	30	22	0.73	8	0.27	423	215	0.51	208	0.49
2004	35	21	0.60	14	0.40	500	266	0.53	234	0.47
2005	42	21	0.50	21	0.50	491	235	0.48	256	0.52
2006	31	16	0.52	15	0.48	551	286	0.52	265	0.48
2007	27	17	0.63	10	0.37	577	286	0.50	291	0.50
2008	26	19	0.73	7	0.27	407	227	0.56	180	0.44
2009	14	8	0.57	6	0.43	236	135	0.57	101	0.43
2010	15	12	0.80	3	0.20	346	184	0.53	162	0.47
2011	22	10	0.45	12	0.55	384	181	0.47	203	0.53
Total	664	445	0.67	219	0.33	9343	4784	0.51	4559	0.49

Panel B: Dual-class and propensity-matched single-class firms

	Dual-class firms					Propensity-matched single-class firms				
Year	Number of M&As	Nondiversifying M&As	%	Diversifying M&As	%	Number of M&As	Nondiversifying M&As	%	Diversifying M&As	%
1994	15	11	0.73	4	0.27	17	6	0.35	11	0.65
1995	27	19	0.70	8	0.30	13	9	0.69	4	0.31
1996	39	31	0.79	8	0.21	24	15	0.63	9	0.38
1997	43	27	0.63	16	0.37	48	24	0.50	24	0.50
1998	40	26	0.65	14	0.35	38	18	0.47	20	0.53
1999	58	34	0.59	24	0.41	30	12	0.40	18	0.60
2000	37	26	0.70	11	0.30	33	6	0.18	27	0.82
2001	25	17	0.68	8	0.32	28	18	0.64	10	0.36
2002	38	25	0.66	13	0.34	14	7	0.50	7	0.50
2003	23	15	0.65	8	0.35	16	7	0.44	9	0.56
2004	23	13	0.57	10	0.43	11	9	0.82	2	0.18
2005	35	16	0.46	19	0.54	26	8	0.31	18	0.69
2006	26	11	0.42	15	0.58	14	5	0.36	9	0.64
2007	20	13	0.65	7	0.35	13	8	0.62	5	0.38
2008	24	17	0.71	7	0.29	14	9	0.64	5	0.36
2009	11	6	0.55	5	0.45	6	4	0.67	2	0.33
2010	15	12	0.80	3	0.20	17	8	0.47	9	0.53
2011	17	6	0.35	11	0.65	28	14	0.50	14	0.50
Total	516	325	0.63	191	0.37	390	187	0.48	203	0.52

Table 1.7: Univariate tests of the probability of M&As in a given year

This table compares the probability of M&As, diversifying M&As, and nondiversifying M&As in a given year between dual-class and all single-class firms. Specifically, the probability of M&As is the ratio of the total number of M&A activities to the total number of firms in a given year based on either dual-class or single-class firms. In addition, the probability of nondiversifying M&As is the total number of nondiversifying M&As to the total number of M&As in a given year. Diversifying and nondiversifying M&As are classified based on acquiring and target firms' 4, 3, and 2-digit SIC codes. The M&As sample consists of all completed mergers by U.S. public companies recorded in the SDC Mergers and Acquisition database between January 1994 to December 2011. We calculate the difference in each year and then report the average difference over time and the associated *t*-values based on Newey-West standard errors with one year lag. Statistical significance at the 1%, 5%, and 10% levels are indicated by ***, **, and *, respectively. All variables are described in detail in the appendix.

	Dual- and single- class firms			Dual- and propensity-matched single-class firms		
	Dual-class firms	Single-class firms	Difference (1)	Dual-class firms	Single-class firms	Difference (2)
Probability of M&As in a given year	0.115	0.072	0.043***	0.107	0.087	0.021**
			[7.05]			[2.31]
Probability of nondiversifying M&As (4 digit SIC)	0.473	0.343	0.130***	0.427	0.345	0.082**
			[3.57]			[2.27]
Probability of diversifying M&As (4 digit SIC)	0.527	0.657	-0.130***	0.573	0.655	-0.082**
			[-3.57]			[-2.27]
Probability of nondiversifying M&As (3 digit SIC)	0.672	0.55	0.123***	0.641	0.538	0.103***
			[5.22]			[2.68]
Probability of diversifying M&As (3 digit SIC)	0.328	0.450	-0.123***	0.359	0.462	-0.103***
			[-5.22]			[-2.68]
Probability of nondiversifying M&As (2 digit SIC)	0.783	0.670	0.114***	0.767	0.684	0.073**
			[5.32]			[1.96]
Probability of diversifying M&As (2 digit SIC)	0.216	0.330	-0.114***	0.233	0.306	-0.073**
			[-5.32]			[-1.96]

Table 1.8: Logit regression analysis of M&As on dual- and single-class firms

This table reports coefficients from logit models of firms' M&As. The M&As sample consists of all completed mergers by U.S. public companies recorded in the SDC Mergers and Acquisition database between January 1994 to December 2011. Dependent variable equals to one if a firm completed M&As, has diversifying or nondiversifying M&As. Specifically, diversifying and nondiversifying M&As are classified based on acquiring and target firms' 4-digit SIC code. Each regression includes the year fixed effects and Z-scores clustered at firm-year level are in brackets. Statistical significance at the 1%, 5%, and 10% levels are indicated by ***, **, and *, respectively. All control variables are described in detail in the appendix.

	Dual- and single- class firms			Dual- and propensity-matched single-class firms		
	(1)	(2)	(3)	(4)	(5)	(6)
	M&A = 1	Nondiversifying M&A = 1	Diversifying M&A = 1	M&A = 1	Nondiversifying M&A = 1	Diversifying M&A = 1
Dual class share	0.285**	0.196**	-0.395***	0.308**	0.270**	-0.318**
(dummy)	[2.00]	[1.97]	[-3.54]	[2.15]	[2.02]	[-2.44]
ln(Firm size)	0.855***	0.603***	0.600***	0.504***	0.620***	0.461***
	[20.61]	[33.26]	[38.24]	[15.78]	[13.18]	[9.12]
Book-to-market	-0.109	-0.100	0.140	-0.076	-0.117	-0.262
	[-0.59]	[-1.08]	[1.39]	[-0.43]	[-0.60]	[-1.45]
Leverage	-0.224	-0.432***	-0.364**	-0.039	0.001	-0.447*
	[-1.00]	[-2.68]	[-2.22]	[-0.25]	[0.20]	[-1.73]
Dividends	-0.390***	-0.395***	-0.161***	-0.086	-0.230*	0.088
(dummy)	[-4.99]	[-6.35]	[-2.91]	[-0.75]	[-1.86]	[0.58]
Turnover	-0.002	-0.096	-0.872***	-0.076	0.314**	-0.670*
	[-0.22]	[-0.68]	[-4.18]	[-0.23]	[2.28]	[-1.78]
Stock returns	-0.058	-0.001	-0.038	-0.057	-0.033	-0.055
	[-0.52]	[-1.57]	[-0.75]	[-1.61]	[-0.67]	[-0.67]
Observations	34,155	34,155	34,155	6,714	6,714	6,714
Pseudo R-squared	0.168	0.130	0.132	0.092	0.101	0.085
Intercept/ Year fixed effect	YES	YES	YES	YES	YES	YES
Cluster	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year	Firm & Year

Table 1.9: Univariate tests of differences in risk-taking propensity around M&As

This table shows changes in the number of segments, correlation, and volatility in Q, cash flow, and earnings around firms' M&As. Specifically, this analysis only includes dual-class and single-class firms that completed M&As from 1994 to 2011. We define all changes in the table as differences between the average number of segments, correlation and volatility in Q, cash flow and earnings in eight quarters (i.e. two years) before and after M&As. Cash flow is the ratio of cash flow to total assets and earnings is the earnings per share (EPS) in Compustat. *t*-statistics are given in brackets. Statistical significance at the 1%, 5%, and 10% levels are indicated by ***, **, and *, respectively. All variables are described in detail in the appendix.

	Dual- and single- class firms			Dual- and propensity-matched single-class firms		
	Dual-class firms	single-class firms	Difference (1)	Dual-class firms	Single-class firms	Difference (2)
Δ Number of Segments	0.091	0.304	-0.214***	0.133	0.322	-0.189***
			[-5.27]			[-2.69]
Δ Q correlation	0.000	-0.010	0.010***	-0.003	-0.008	0.005**
			[3.20]			[1.96]
Δ Q volatility	0.037	-0.088	0.125***	0.030	-0.089	0.119***
			[6.67]			[4.94]
Δ Cash flow correlation	0.001	-0.010	0.011***	0.002	-0.007	0.009*
			[3.81]			[1.72]
Δ Cash flow volatility	0.043	-0.015	0.058*	0.042	0.001	0.042***
			[1.85]			[5.66]
Δ Earnings correlation	-0.002	-0.011	0.009***	0.004	0.003	0.001**
			[2.78]			[2.28]
Δ Earnings volatility	23.368	3.139	20.229**	23.526	-27.805	51.332**
			[1.98]			[1.97]

Table 1.10: Regression analyses explaining changes in risk-taking propensity around M&As

This table reports regression results of the effect of dual-class on changes in the number of segments and correlation and volatility in Q, cash flow and earnings. Specifically, this analysis only includes dual-class and single-class firms that completed M&As from 1994 to 2011. Panel A and B consist of dual-class and single-class firms and dual-class and propensity-matched single-class firms, respectively. We define all changes in the table as differences between the average number of segments, correlation and volatility in Q, cash flow and earnings in eight quarters (i.e. two years) before and after M&As. Cash flow is the ratio of cash flow to total assets and earnings is the earnings per share (EPS) in Compustat. Control variables are obtained from the previous fiscal year-end of M&A year. The *t*-values used for significance tests are based on robust standard errors and are in brackets. Asterisks indicate significance at the 0.01(***), 0.05(**), and 0.01(*) levels. All control variables are described in detail in the appendix.

Panel A: Dual-class and all single-class firms

	(1) Δ Number of segments	(2) Δ Q correlation	(3) Δ Q volatility	(4) Δ Cash flow correlation	(5) Δ Cash flow volatility	(6) Δ Earnings correlation	(7) Δ Earnings volatility
Dual class share	-0.236***	0.010***	0.086***	0.012***	0.040***	0.009**	19.948*
(dummy)	[-5.93]	[3.10]	[7.83]	[3.77]	[5.41]	[2.42]	[1.91]
ln(Firm size)	0.006	-0.001	0.023***	-0.000	0.052	0.000	-3.766
	[0.77]	[-1.16]	[4.46]	[-0.77]	[0.95]	[0.32]	[-0.58]
Book-to-market	-0.054	0.001	0.005	-0.002	0.196	-0.000	-2.552
	[-1.32]	[0.30]	[0.22]	[-0.86]	[0.93]	[-0.02]	[-0.09]
Leverage	0.154***	-0.001	0.101***	-0.003	-0.417	-0.002	-35.124
	[3.56]	[-0.35]	[3.50]	[-0.89]	[-0.92]	[-0.82]	[-0.99]
Dividends	0.020	0.003**	0.052***	-0.001	0.002	-0.001	31.339**
(dummy)	[0.97]	[2.09]	[5.76]	[-0.53]	[0.27]	[-0.38]	[2.13]
Turnover	-0.151***	0.005*	-0.181***	0.002	-0.148	-0.002	-16.787
	[-3.66]	[1.76]	[-4.79]	[0.52]	[-0.90]	[-0.80]	[-0.69]
Stock returns	-0.003	0.001	0.052***	0.001*	-0.005	-0.000	-3.324
	[-0.44]	[1.00]	[2.61]	[1.77]	[-1.45]	[-0.28]	[-0.95]
Relative size	-0.000***	0.000	0.000***	0.000	-0.000	0.000	-0.009***
	[-2.74]	[0.93]	[3.23]	[0.14]	[-0.93]	[0.23]	[-18.27]
Stock M&A	0.001	-0.000	-0.044**	0.000	-0.127	0.003	-4.530
	[0.05]	[-0.09]	[-2.27]	[0.02]	[-0.99]	[1.25]	[-0.23]
Cash M&A	-0.043**	-0.000	-0.006	-0.003*	-0.022	0.001	-4.936
	[-1.98]	[-0.27]	[-0.71]	[-1.88]	[-0.97]	[0.35]	[-0.28]
Observations	6,403	6,403	6,403	6,403	6,403	6,403	6,403
Intercept	YES	YES	YES	YES	YES	YES	YES
R-squared	0.009	0.003	0.064	0.004	0.008	0.002	0.001

Panel B: Dual-class and propensity-matched single-class firms

	(1) Δ Number of segments	(2) Δ Q correlation	(3) Δ Q volatility	(4) Δ Cash flow correlation	(5) Δ Cash flow volatility	(6) Δ Earnings correlation	(7) Δ Earnings volatility
Dual class share	-0.227***	0.005**	0.097***	0.009*	0.044***	0.012**	42.093*
(dummy)	[-3.09]	[2.00]	[4.33]	[1.77]	[5.64]	[2.33]	[1.73]
ln(Firm size)	0.072**	-0.002	0.020**	0.000	-0.001	0.001	3.112
	[2.07]	[-0.85]	[1.97]	[0.12]	[-0.24]	[0.90]	[0.55]
Book-to-market	0.168	-0.006	0.051	0.005	0.022	0.013*	-118.856*
	[0.99]	[-0.82]	[0.94]	[0.69]	[1.35]	[1.83]	[-1.71]
Leverage	-0.057	0.012	0.107*	-0.014**	-0.023	-0.005	-61.096
	[-0.44]	[1.49]	[1.92]	[-2.34]	[-1.20]	[-0.88]	[-0.65]
Dividends	-0.064	0.001	0.049**	0.002	0.000	-0.009*	28.691*
(dummy)	[-0.85]	[0.16]	[1.99]	[0.35]	[0.07]	[-1.88]	[1.65]
Turnover	-0.429**	0.015	-0.120	0.001	0.047	0.003	-274.818
	[-2.57]	[1.45]	[-1.08]	[0.08]	[1.32]	[0.31]	[-1.56]
Stock returns	-0.014	0.002	0.076***	-0.001	-0.017***	0.001	8.367
	[-0.35]	[0.64]	[3.50]	[-0.22]	[-3.28]	[0.55]	[0.84]
Relative size	-0.000***	0.000	0.000*	-0.000	0.000	-0.000	-0.010***
	[-2.66]	[0.82]	[1.71]	[-0.60]	[0.10]	[-1.29]	[-22.87]
Stock M&A	0.084	-0.005	-0.020	0.006	0.000	0.002	12.477
	[0.47]	[-0.96]	[-0.35]	[0.92]	[0.00]	[0.19]	[0.45]
Cash M&A	0.004	0.008	0.028	0.005	-0.002	-0.003	-32.653
	[0.06]	[1.36]	[1.37]	[0.86]	[-0.25]	[-0.51]	[-1.07]
Observations	524	524	524	524	524	524	524
Intercept	YES	YES	YES	YES	YES	YES	YES
R-squared	0.030	0.009	0.125	0.010	0.091	0.019	0.057

Chapter Two: CEO Appointment in Corporate Spin-Offs

1. Introduction

Many studies show that different CEO styles or characteristics affect corporate decisions and performance. Our study provides new evidence on the topic. Specifically, using a sample of spin-offs, we look at how CEOs with certain expertise affect shareholder wealth and operating performance. If CEOs with financial expertise are appointed at the spun-off units, there are positive abnormal announcement returns, higher amounts of external financing and better operating performance after spin-offs.

Spin-offs are unique events that provide many opportunities to examine corporate finance issues such as a firm's investment policy and restructuring of the firm's assets. The majority of spin-off studies focus on the consequences of spin-offs in which a firm separates one or more of its subsidiary(s), creating a publicly traded firm. For instance, since a conglomerate's diversification discount is attributable to its inefficient investment policies, refocusing through spin-offs significantly increases the firm's investment efficiency (Ahn and Denis, 2004; Burch and Nanda, 2003; Ahn and Walker, 2007).

However, we still know very little about how corporate governance structure changes around spinoff transactions. In practice, existing firms (referred to as parent firms) determine large aspects of the spin-off dynamic, such as signaling which unit will be spun off, and the selection of the unit's management team (Wachtell et al., 2013). In most spin-offs, parent firms choose one of their executives or promote a division manager as the spun-off unit's CEO[4]. We hereafter refer to these as parent firm CEOs and division CEOs,

[4] Wruck and Wruck (2002) classified the CEOs of spun-off units as insiders and outsiders. The insiders are spun-off unit CEOs with long tenure at parent firms and the outsiders are spun-off unit CEOs hired as executives at parent firm fewer than three years before the spin-off announcement. In our sample, we only have eight outsiders based on Wruck and Wruck (2002) classification and their average tenure at parent firm

respectively. Wruck and Wruck (2002) study the cross-sectional variation in terms of restructuring top management at spun-off units. Specifically, they find that when one of the parent firm's executives is assigned as top management of the spun-off unit, there is a significant wealth effect at the spin-off announcement. They explain that this occurs because executives at parent firms might be governance experts or perhaps possess more management experience compared to division heads.

However, it is still not clear what kind of expertise is related to the value creation of spin-offs if they have any. On the other hand, it is also possible that parent firms search for specific expertise for spun-off unit CEO candidates regardless of whether they are parent executives or division heads. So, in this study, we investigate corporate spin-offs in terms of changes in governance structure, specifically, in the selection of CEOs at spun-off units.

A variety of studies show that one of the most important reasons of spin-offs is to enhance accessibility to capital markets following spin-offs in order to accelerate spun-off units' growth opportunities. For example, Krishnaswami and Subramaniam (1999) empirically show that since spin-offs mitigate information asymmetry, a firm with weak cash flow is more likely to engage in a spin-off if its subsidiary has potential stand-alone growth opportunities. Thus, we hypothesize that parent firms prefer to assign CEOs with financial expertise at spun-off units if firms in need of external financing are more likely to engage in spin-offs.

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is 2.86 years before the spin-off announcement. Since we are interested in rationale for parent firms' choice between parent firm CEOs and division CEOs, we classified these outsiders as parent firm CEOs in our sample.

In other words, we believe that spun-off unit CEOs with financial expertise can better utilize an in-depth understanding of external capital market resources compared to those without such financial expertise. Accordingly, we predict that shareholders' wealth significantly increase when parent firms appoint CEOs with financial expertise at spun-off units. This is affirmed by Miles and Rosenfeld (1983) who suggest that a spin-off announcement should result in a positive market reaction if investors expect increased future cash flows through the firm's divestiture. At the same time, we expect to see significantly increased external financing activities for firms with spun-off unit CEOs with financial expertise following the spin-off.

We find that the choice of spun-off unit CEOs explains a great deal of cross-sectional variation in the stock market reaction to spin-off announcements and operating performance, especially when CEOs with financial expertise are appointed at spun-off units. For instance, the stock market reaction to the spin-off announcement is significantly greater when financial experts are appointed at spun-off units as CEOs. Additionally, the considerable growth in external financing following spin-offs is mostly attributable to firms with spun-off unit CEOs possessing financial expertise. Consequently, the post-spinoff firm's operating performance significantly improves for firms with spun-off unit CEOs with financial expertise. When CEOs with non-financial expertise are chosen regardless of their position at parent firms, we observe zero or negligible stock price reaction at the spin-off announcement, and detect no significant changes in external financing activities or operating performance following spin-offs.

Our study contributes to the growing literature on CEOs' skills and their impact on operating performance. Using a sample of spin-offs, the evidence shows that CEOs with

financial expertise appear to improve firms' accessibility to external capital markets and consequently, enhance operating performance.

The remainder of the paper is organized as follows. Section 2 and 3 describe our data and report descriptive statistics. In section 4, we examine stock market reaction to spin-off announcement and post-transaction changes in external financing activities and operating performance based on spun-off unit CEOs with financial expertise. Section 5 concludes the study.

2. Data collection and sample formation

Our sample consists of 109 completed spin-offs between 1994 and 2009. The initial 431 spin-off samples are drawn from the Security Data Corporation (SDC)'s Merger and Acquisition database on spin-offs taking place between 1994 and 2009. Based on the deal synopsis from SDC, we exclude transactions from the initial sample if (a) it occurred as a result of parent firm's lawsuit or acquisition by another firm, (b) the spin-off occurred because of parent firm's merging with another firm or (c) either the parent firm or the spun-off unit was acquired by or merged with another firm in the year after the spin-off. After this procedure, we have 244 spin-off samples.

Of the 244 samples, we retain observations satisfying the following criteria. First, we include all successfully completed spin-offs in the United States. Second, we require the spin-offs to make a 100% distribution of the unit's stock to shareholders (i.e. the non-taxable spin-offs) to ensure that the spun-off unit is an independent firm. Third, we restrict the sample to firms having at least two years of financial data on COMPUSTAT and stock price information on CRSP before spin-offs for parent firms and after spin-offs for both

parent firms and spun-off units. Fourth, we retain 29 spin-offs in which the spun-off units are publicly traded at the time of spin-off announcement and exclude 13 deals involving carve-outs over the sample period. Additionally, we require parent firms and both the resulting parent firms and spun-off units to issue a proxy statement available in the year preceding the spin-off announcement and in the year succeeding the spin-off execution, respectively. Lastly, we exclude spun-off units operating in financial services and utilities (SIC 4900-4999, 6000-6999). This selection process leaves us with 109 spin-offs during the sample period. The number of our spin-off samples is similar to other recent studies in spin-offs. For example, Denis et al. (2012) have 93 spin-off samples from 1994 to 2003 and the number of our spin-offs is 95 during their aforementioned sample period.

In order to control for firm-specific characteristics in our analysis, we identify each parent firm's and spun-off unit's control firm from a universe of COMPUSTAT after excluding parent firms and spun-off units in our sample. Specifically, we identify parent firms' matching groups by applying the propensity score matching based on firm characteristics in the year preceding the spin-off announcement: the 48 Fama and French industry classifications (1997; hereafter FF 48 industry), firm size, firm age, the number of segments and other characteristics that are commonly used in spin-off studies . In order to identify matching firms for spun-off unit, we construct the initial pool of matching groups consisting of single segment firms. Additionally, we exclude firms older than five years in each year from the initial matching sample group for spun-off units. This age restriction ensures the reasonable maturity of matching firms (Patro, 2008). Next, we define matching firms for spun-off units by applying the propensity score matching based on firm characteristics in the year subsequent to the execution of the spin-off.

Panel A in Table 2.1 reports a time profile of spin-off announcement and the mean (median) segments of parent and matching firms by year. The number of spin-off announcements varies during the sample period: a low of one in 2006 and a high of 17 in 2000. Additionally, 87% (95 out of 109) of spin-off announcements occur from 1994 to 2003. Untabulated results show that there are no specific industry patterns based on the FF 48 industry classification in spin-off decision. In Panel B, we show the number of spin-off executions by year during the sample period. Further, we classify 109 spin-offs based on whether the CEOs of spun-off units were one of the parent firm's executives (i.e. Parent firm CEOs) or a former division head (i.e. Division CEOs). Additionally, each of CEOs in the 109 spun-off units is classified as a financial expert if the CEO has served as a director on the audit committee or in a financial institution before the spin-off announcement or had prior financial industry experience for current or past employment in financial firms (SIC 6000-6999) suggested by Fracssi and Tate (2012) and Guner et al. (2008). We check CEOs' backgrounds based on CEO profiles in the proxy statement of parent firms and spun-off units. Specifically, we classify the following types of parent firm CEOs and division CEOs as financial experts: directors serving on audit committees or directors of financial institutions in the five years before spin-offs. We exclude academic backgrounds, since Anderson et al. (2004) suggest that it is ambiguous to identify financial expertise according to academic background.

Of the 109 spin-offs, 30 (28%) spun-off units are division CEOs and 79 (72%) spun-off units are parent firm CEOs. Wruck and Wruck (2002) classified the CEOs of spun-off units as insiders and outsiders. The insiders are spun-off unit CEOs with long tenure at parent firms and the outsiders are spun-off unit CEOs hired as executives at parent

firm fewer than three years before the spin-off announcement. In our sample, we only have eight outsiders based on Wruck and Wruck (2002) classification and their average tenure at parent firm is 2.86 years before the spin-off announcement, and we classify these outsiders as parent firm CEOs in our sample. In addition, 57 spun-off unit CEOs (53%) in our 109 spin-off samples are classified as financial experts: 43% of division CEOs (13 out of 30) and 56% of parent firm CEOs (44 out of 79).

3. Descriptive statistics

Table 2.2 reports descriptive statistics for the sample firms. In Panel A of Table 2.2, we compare spin-offs to non-spin-offs in terms of firm characteristics. We find a matching non-spin-off firm as a control group for each spin-off firm based on each firms' characteristics. Appendix A defines all variables. Specifically, we estimate the following logistic model:

$$
\begin{aligned}
&Prob(Spin-off=1)\\
&\quad = \propto_0 + \beta_1 Firm\ Size + \beta_2 Firm\ Age + \beta_3 Segments\\
&\quad + \beta_4 Information\ Asymmetry + \beta_5 Board\ Size\\
&\quad + \beta_6 Outside\ Block\ Ownership + \beta_7 Product\ Market\ Concentration\\
&\quad + \beta_8\ Leverage + \beta_9\ Industry\ Dummies\ (FF48) + \beta_{10}\ Spin\\
&\quad - off\ Year\ Dummies + \mu_{it.}
\end{aligned}
$$

Panel B compares parent firm CEOs to division CEOs in terms of their parent firm characteristics. The parent and the matching firms' information in Table 2.2 are obtained

for the fiscal year ending just prior to the spin-off announcement. The spun-off unit's size equals total assets at the first fiscal year subsequent to the execution of spin-off.

Panel A of Table 2.2 indicates that, on average, spin-off firms and non-spin-off firms look quite similar. Following Dierkens (1991) and Krishnaswami and Subramaniam (1999), the information asymmetry is measured as the standard deviation of the three-day abnormal returns for all quarterly earnings announcements in the five years preceding the spin-off announcement. The mean (median) R&D intensity is 0.049 (0.000) and 0.041 (0.000) for spin-off firms and non-spin-off firms, and the difference is not statistically significant. The R&D intensity of spin-off firms is higher than previous studies in spin-offs. Specifically, Patro (2008) reports the mean (median) R&D intensity of spin-off firms is 0.036(0.000) during the sample period from 1981 to 2000. The higher R&D intensity in our samples from 1994 to 2009 reflects the increase in R&D spending over time in U.S. industry (Franzen et al., 2007). Spin-off firms have slightly higher operating cash flow and cash and investment than their matching non-spin-off firms, but the difference is not statistically significant. Ahn and Walker (2007) report that, during their sample period from 1981 to 1997, the mean Tobin's Q of spin-offs and non-spin-offs is 1.857 and 1.616 and similar to our samples: 1.734 for spin-offs and 1.613 for non-spin-offs. Board characteristics for spin-offs are also quite similar to non-spin-off firms such as board size and the portion of outside directors and non-busy director. Compared to previous studies, these numbers are not significantly different. For example, Coles et al. (2008) show that the mean (median) board size is 10.4 (10) and the median fraction of outside directors is 0.84 during their sample period from 1992 to 2001.

In Panel B of Table 2.2, we report the comparison results of firm characteristics between parent firm CEOs and division CEOs. The firm size of parent firm CEOs is smaller than that of division CEOs; the mean difference is -60324.30 (= 26586.87 – 33734.43), while the median difference is 167.31 (=2581.44 – 2748.76), both statistically significant at the 10 percent level. At the same time, parent firm CEOs retain lower cash and generate lower operating cash flow than division CEOs. Relatively small firm size and low cash holdings for parent firm CEOs appear to be related to their financial constraints. These results are supported by earlier research on financial constraints that defines financially constrained firms as small firms or firms with poor credit ratings (Campello et al., 2010). For board characteristics, parent firm CEOs have a considerably higher proportion of outside block ownerships and non-busy directors than division CEOs. For relative size between parent firms and spun-off units, we apply two different methods: relative size 1 based on the market value of total assets and relative size 2 based on the book value of total assets. It indicates that two groups have a similar relative size 2.

4. Empirical results

In this section, we investigate whether parent firms appoint spun-off unit CEOs with financial expertise in order to maximize the units' potential growth and improve access to capital markets regardless of spun-off unit CEOs' previous position as parent executives or division heads. Specifically, we examine the stock market reaction to firms' choice between parent firm CEOs and division CEOs, and between financial expert CEOs and non-financial experts in section 5-1. We also investigate changes in external financing

activities prior to and following spin-offs between parent firm CEOs and division CEOs, and between financial experts CEOs and non-financial experts in later sections.

4.1. Wealth effect of parent firm CEOs

Panel A of Table 2.3 reports the abnormal returns on the spin-off announcement for full-sample with 109 spin-offs and 109 non-spin-offs. Our analysis focuses on the cumulative three-day announcement returns (i.e. CAR (-1,+1)) starting the day before the spin-off announcement. Additionally, cumulative abnormal returns are adjusted by market model, Fama-French three factors and the four factor model. Previous studies in spin-offs report that spin-off announcement abnormal returns are significantly positive, ranging from 2.6% to 5.8% (Schipper and Smith, 1983; Daley et al., 1997; Krishnaswami and Subramaniam, 1999; Chemmanur et al., 2010). In our sample, the average abnormal return on the spin-off announcement date is approximately 3.4% and is significantly different from zero across all three different return adjustment models.

In Panel B of Table 2.4, we investigate the difference of CAR (-1, +1) between spin-offs with parent firm CEOs and division CEOs. When a spin-off firm chooses one of its executives as a spun-off unit's CEO, Panel B indicates that CAR (-1, +1) is around 4% and significantly different from zero across all adjusted excess returns. CAR (-1, +1) for spin-offs with division CEOs is around 2% and also significantly different from zero. At the same time, Panel C shows how the market reacts on the announcement of appointing financial experts and non-financial experts as CEOs at the spun-off units. On average, there are 5% and 1.3% cumulative three-day announcement returns for appointing financial expert CEOs and non-financial expert CEOs at spun-off units, respectively, and both of the excess returns are statistically significant at the 5 percent or the 10 percent level. Even

though different groups of spun-off unit CEOs in Panel B and C show positive and significant abnormal returns on spin-off announcement dates, the difference of CAR (-1,+1) between financial expert CEOs and non-financial expert CEOs is twice as high as the difference of CAR (-1,1) between parent firm CEOs and division CEOs. These results suggest that the positive excess returns to spin-off announcement in Panel A are mostly attributable to financial expert CEOs at spun-off units in Panel C.

However, there are other factors that may affect abnormal returns on spin-off announcement, especially when parent firms decide to appoint financial experts as spun-off unit CEOs. To see if our results of univariate tests in Table 2.3 are driven by factors other than the appointment of financial expert CEOs at spun-off units, we perform multiple regression to control for these factors. In Table 2.4, we test that any positive consequence associated with the appointment of financial expert CEOs will be most pronounced regardless of spun-off unit CEOs' previous position as parent executives or division heads. Table 2.4 presents six different regression models including independent variables for parent firm CEOs, division CEOs, and financial expert CEOs and interaction terms between parent firm CEOs and financial expert CEOs (i.e. PE × FE) and between division CEOs and financial expert CEOs (i.e. DE × FE). Specifically, two interaction terms (i.e. PE × FE and DE × FE) capture the incremental effect of spun-off unit CEOs with financial expertise in increasing shareholders' wealth. Specifically, we expect to see the positive and statistically significant coefficient on the interaction terms between division CEOs and financial expert CEOs if the appointment of financial expert CEOs is the most important factor affecting positive and significant market reaction to firms' spin-off announcement.

First, positive and significant coefficients on financial expert CEOs across all columns in Table 2.4 add support to the univariate tests in Table 2.4 that demonstrate how appointing spun-off unit CEOs with financial expertise brings significant positive wealth effect. Moreover, the stock market reaction to appointing division CEOs with financial expertise (i.e. DE × FE) is positive and statistically significant at the 5% confidence level in column (2), (4), and (6). These results confirm our findings of univariate tests in Table 2.4 that the expected benefits of spun-off unit CEOs with financial expertise are significantly positive regardless of the CEOs previous position as parent executives or division managers. However, it does not directly support our hypothesis that parent firms appoint financial experts as CEOs at spun-off units to increase external funding, to maximize investment opportunities, and ultimately to improve operating performance. Therefore, in the next sections we investigate how the appointment of spun-off unit CEOs with financial expertise affects changes in external financing activities and operating cash flows before and after spin-off executions.

4.2. Abnormal changes in capital raising activities

Since we believe that spun-off unit CEOs with financial expertise have in-depth knowledge of capital markets, we examine, in this section, whether financial expert CEOs have better access to capital markets than the different types of spun-off unit CEOs such as parent firm CEOs or division CEOs. Specifically, we look into the dollar amount changes in external financing involving spin-offs. To perform these analyses, we compute the combined amount of external financing following spin-offs by adding the net increase in external financing of post-parent and spun-off units. We define the amount of external financing of matching non-spin-off firms in a similar way.

In Table 2.5, we compare the dollar amounts of external financing[5], equity and debt, raised by spin-offs to non-spin-offs and parent firm CEOs to division CEOs in Panel A and B, respectively. The last two columns, (5) and (6), in Panel A and B present the changes and average two-year changes of external financing prior to and following spin-offs. Additionally, Panel C shows the changes in the amount of external financing around spin-off between financial expert CEOs and non-financial expert CEOs, and concurrently between parent firm CEOs and division CEOs.

First, we apply the univariate test to analyze the changes in external financing activities prior to and following spin-offs for a sample of 109 spin-offs and non-spin-offs. Panel A of Table 2.6 shows that spin-off firms' external financing activities are significantly increased after spin-offs compared to non-spin-off firms. In the first and second year following the transactions, the abnormal amount of capital raised by spin-off firms equals $150.97 and $174.99 million dollars and is statistically significant at the 5% level. Specifically, equity financing accounts for 40% of changes in the total abnormal financing involving spin-off executions. This is consistent with the findings of Krishnaswami and Subramaniam (1999) that considerably increased equity financing is due to the reduced asymmetric information for spin-off firms. They explain that the reduced asymmetric information helps increase the firm's share price and eventually makes equity financing less costly than before the spin-off (Nanda and Narayanan, 1997).

Second, we test the difference in external financing between 79 parent firm CEOs and 30 division CEOs. As shown in the difference in Panel B, parent firm CEOs raise significantly higher amounts of external financing than division CEOs. Specifically,

[5] In order to measure the amount of net equity and the net debt issued, we follow the methods suggested by Hovakimian et al (2001, 2004).

column (5) in Panel B indicates that the one-year changes (-1, +1) of abnormal external financing raised by parent firm CEOs and division CEOs are $178.55 million and $78.33 million and statistically significant at the 10% level. Next, in Panel C, we look closely into whether financial expertise has a significant impact on the increased external financing that we show in Panel A and B of Table 2.6. If spun-off unit CEOs with financial expertise possess an in-depth understanding of capital markets, we expect that these financial experts raise significantly more external financing than non-financial experts in the sample.

Panel C of Table 2.6 indicates that 55% of parent firm CEOs (44 out of 79) and 43% of division CEOs (13 out of 30) are classified as financial experts. The changes in one-year and average two-year dollar amounts of raised capital by financial experts are significantly higher than non-financial experts by $93.62 million (= $195.63 m – $102.01) and by $97.63 million (= $221.09 m – $124.46) and both differences are statistically significant at the 5% level. Moreover, parent firm CEOs with financial expertise raise $205.58 million of external financing, significantly higher than the amount of external financing raised by parent firm CEOs with non-financial expertise.

Having financial expertise for division CEOs also makes significant differences in external financing activities following spin-off executions. In two-year average changes of abnormal external capital financing, division CEOs with financial expertise raise $194.47 million and division CEOs with non-financial expertise only raise $9.97 million. These results suggest that even though parent firm CEOs' non-measurable characteristics might improve firms' accessibility to external capital markets as shown in Panel B, financial experts significantly enhance firms' access to capital markets regardless of spun-off unit CEOs' position prior to spin-offs.

Lastly, we perform multiple regression of the change in abnormal external financing activities around spin-off on parent firm CEOs, division CEOs and financial expert CEOs with other control variables. The results in Table 2.6 also confirm our results in Panel C of Table 2.5. In column (2), (3) and (4) in Panel A and B, the positive and statistically significant coefficients on financial experts suggest that considerable amounts of external financing are raised by spun-off unit CEOs with financial expertise after spin-offs. At the same time, in column (4) in Panels A and B, the coefficients on division CEOs with financial expertise (i.e. DM × FE) suggest that financial expertise has positive and statistically significant effect on the abnormal changes in external financing regardless of spun-off unit CEOs' previous positions at parent firm prior to spin-offs. These results in Table 2.5 and 2.6 are in line with Krishnaswami and Subramaniam (1999) findings that firms in need of external financing are more likely to engage in spin-offs. If all these results are driven by proper assumptions and models, we expect to see thereafter significantly improved operating performance for spin-off firms with spun-off unit CEOs with financial expertise.

4.3 Abnormal changes in operating cash flows

In this section, we test how operating performance changes around spin-off transactions by looking at different groups of spun-off unit CEOs: parent firm CEOs, division CEOs and spun-off unit CEOs with financial expertise. In Panel A of Table 2.7, we compare the abnormal changes in operating cash flows of spin-off firms with non-spin-off firms. Panel B reports the difference in operating cash flows between spin-offs with parent firm CEOs and division CEOs prior to and following the transactions. Additionally, Panel C shows

changes in operating cash flows between financial experts and non-financial experts and between parent firm CEOs and division CEOs at the same time.

Firm's performance equals its operating cash flow returns as suggested by other spin-off studies (Daley et al. (1997); Desai and Jain (1999); Chemmanur et al. (2010)). Specifically, firm's operating cash flows are measured in two different ways suggested by Denis and McKoen (2012) as Operating Cash Flow (1) and Chemmanur et al. (2010) as Operating Cash Flow (2) and each firm's operating cash flow is scaled by its total assets. For this analysis, we construct a hypothetical combined entity (i.e. pro-forma firm) that includes a parent firm and its spun-off unit in proportion to year-end market value. Matching non-spin-off firms are also constructed in a similar fashion after defining a matching firm for each parent firm and spun-off unit based on propensity matching scores.

Panel A of Table 2.7 shows that spin-off firms' performance following the transactions significantly improved compared to non-spin-off firms. For instance, abnormal operating cash flow returns (1) and (2) for spin-off firms are improved by 0.015 and 0.013 in the one year before and after spin-offs, year (-1, +1) and the changes are significantly different from zero at the 5% confidence level. Panel B indicates that even though the differences of changes in abnormal cash flow returns between parent firm CEOs and division CEOs are statistically significant, abnormal changes in cash flow returns for each of the parent firm CEOs and division CEOs are positive and statistically significant.

On the other hand, Panel C shows that regardless of spun-off unit CEOs' position prior to spin-off, appointing spun-off unit CEOs possessing financial expertise significantly improves operating performance after spin-off transactions. Specifically, even though both

spun-off unit CEOs with and without financial expertise show improved post-transaction performance, financial experts' changes in operating cash flow returns (1) and (2) are 2.22 (= 0.020/0.009) and 2.10 (=0.021/0.010) times higher than non-financial experts in a one year duration, year (-1, +1). Moreover, the positive changes in operating cash flow returns are statistically significant only for spun-off unit CEOs with financial expertise.

In Table 2.8, the multiple regression results are also consistent with the univariate tests in Panel C of Table 2.7. Specifically, all positive and significant coefficients on financial experts (i.e. FE) and on the interaction term between financial expert and division CEOs (i.e. DM × FE) in Panel A and B indicate that after controlling for all other factors, appointing spun-off unit CEOs with financial expertise has a considerable impact on the enhanced spin-off firms' performance following spin-off regardless of spun-off unit CEOs' previous position at parent firm as executive or division manager. We therefore conclude that consistent with our hypothesis, spun-off unit CEOs' expertise in external capital markets is one of most important factors that significantly improve the spin-off firm's performance following spin-off.

5. Conclusion

In this study, we document that parent firms' selection of spun-off unit CEOs is associated with value created by spin-off announcements and post-transaction changes in operating performance based on a sample of 109 spin-offs from 1994 to 2009. Previous studies on spin-offs show that one of the most important reasons for a spin-off is to enhance accessibility to capital markets following spin-off in order to accelerate spun-off units' growth opportunities. Thus, we hypothesize that parent firms prefer to assign CEOs with

financial expertise at spun-off units if firms in need of external financing are more likely to engage in spin-offs. We find spun-off unit CEOs with financial expertise possess in-depth knowledge of capital markets and considerably increase external financing activities and improve operating cash flows following the transaction.

Table 2.1: Distribution of sample spin-offs by year

This table presents a frequency summary of the sample firms that completed a spin-off from 1994 to 2009. The spin-off data is obtained from SDC platinum. There are 109 completed tax-free spin-offs. Panel A reports the spin-off samples by announcement year. Panel A also reports the number of mean (median) segments before the announcement year for spin-off and control firms. The control firms are defined by the propensity score matching based on the 48 Fama and French (1997) industry classifications, firm size, firm age, the number of segments, and all other characteristics from spin-off literatures. In Panel B, the spin-off samples are distributed by spin-off execution year. Further, the samples are portioned on the basis of whether the CEOs of spun-off unit were parent executives (i.e. Parent firm CEOs) or former division heads (i.e. Division CEOs) and whether the parent firm CEOs and division CEOs is a financial expert or a non-financial expert. Specifically, each CEO in the spun-off unit is classified as a financial expert if the CEO was a director serving on the audit committee or in a financial institution before the spin-off announcement or has financial industry experience for current or past employment in financial firms (SIC 6000-6999) suggested by Fracassi and Tate (2012) and Guner et al.(2008).

Panel A: Distribution of spin-off announcements

			Spin-off firms	Non spin-off firms
Year	N	Percentage of sample	Mean (Median) of Segments	Mean (Median) of Segments
1994	6	5.5 %	2.6 (2)	2.8 (3)
1995	12	11.0 %	3.5 (3)	3.2 (3)
1996	10	9.2 %	3.7 (3)	3.1 (3)
1997	15	13.8 %	3.6 (3)	3.2 (3)
1998	11	10.1 %	3.2 (3)	3.3 (3)
1999	8	7.3 %	4.1 (4)	3.5 (3)
2000	17	15.6 %	5.9 (5)	4.4 (4)
2001	5	4.6 %	5.0 (5)	5.5 (6)
2002	4	3.7 %	4.8 (5)	5.3 (6)
2003	7	6.4 %	6.6 (7)	7.2 (7)
2004	3	2.8 %	7.3 (5)	7.3 (5)
2005	3	2.8 %	7.7 (9)	5.7 (6)
2006	1	0.9 %	5.0 (5)	6.0 (6)
2007	5	4.6 %	4.0 (4)	4.8 (4)
2008	2	1.8 %	5.5 (5)	6 .0 (6)
Total	109	100 %	4.48 (4)	4.16 (3.8)

Panel B: Distribution of spin-off executions

Year	N	% of sample	Division (Financial expert) CEOs	Parent firm (Financial expert) CEOs
1994	2	1.8 %	2 (1)	0 (0)
1995	7	6.4 %	2 (2)	5 (3)
1996	17	15.6 %	6 (2)	11 (7)
1997	11	10.1 %	1 (0)	10 (7)
1998	13	11.9 %	5 (2)	8 (4)
1999	6	5.5 %	1 (0)	5 (2)
2000	14	12.8 %	2 (0)	12 (8)
2001	11	10.1 %	2 (1)	9 (2)
2002	5	4.6 %	1 (1)	4 (0)
2003	5	4.6 %	0 (0)	5 (5)
2004	6	5.5 %	2 (0)	4 (2)
2005	3	2.8 %	2 (2)	1 (0)
2006	1	0.9 %	0 (0)	1 (1)
2007	5	4.6 %	2 (1)	3 (2)
2008	1	0.9 %	0 (0)	1 (1)
2009	2	1.8 %	2 (1)	0 (0)
Total	109	100 %	30 (13)	79 (44)

Table 2.2: Summary statistics

The table presents means and medians of key variables for a sample of 109 spin-offs and non-spin-offs in Panel A and 79 parent firm CEOs and 30 division CEOs in Panel B from 1994 to 2009. Dollar values are expressed in 2004 dollars. Accounting and segment data are from COMPUSTAT. Firm board structure and stock ownership by executives, directors and institutional investors are obtained from yearly proxy statements. In Table 2.2, key variables are taken at the end of the prior fiscal year of the spin-off announcement (year -1). Additionally, in Panel B the spun-off unit's size is the total assets at the first fiscal year subsequent to the execution of spin-off. Two-sample t-tests (Wilcoxon-Mann-Whitney tests) are conducted to compare the difference of means (medians) of samples. Statistical significance at the 1%, 5%, and 10% level is indicated by ***,**, and *, respectively. Appendix A defines all variables.

Panel A: Comparison of spin-offs and matching firms

	Full Sample (N = 218)		Spin-off firms (N = 109)		Non-spin-off firms (N = 109)	
	Mean	*Median*	Mean	*Median*	Mean	*Median*
Leverage	0.266	*0.257*	0.261	*0.262*	0.271	*0.251*
Operating cash flow / Assets	0.136	*0.131*	0.142	*0.137*	0.130	*0.131*
Cash & Investment / Assets	0.159	*0.114*	0.165	*0.114*	0.154	*0.114*
Payout ratio	0.519	*0.407*	0.503	*0.375*	0.535	*0.392*
R&D intensity (%)	0.045	*0.000*	0.049	*0.000*	0.041	*0.000*
PPE intensity (%)	0.322	*0.255*	0.313	*0.256*	0.331	*0.255*
Capital expenditure / Sales	0.068	*0.048*	0.065	*0.052*	0.070	*0.049*
Cash / Assets	0.109	*0.048*	0.109	*0.047*	0.108	*0.051*
Firm Size	28,561.20	*3,573.04*	28,554.09	*3,619.28*	28,568.32	*3,210.98*
Board size	10.131	*10.000*	10.266	*10.000*	9.995	*9.500*
Outside directors (%)	0.781	*0.818*	0.783	*0.800*	0.780	*0.824*
Non-busy directors (%)	0.657	*0.700*	0.668	*0.667*	0.647	*0.714*
Insider ownership	10.564	*4.065*	9.387	*4.000*	11.741	*4.090*
Outside block ownership	23.824	*12.285*	32.415	*11.200*	15.233*	*12.470*
CEO total compensation	3,314,797	*1,287,344*	3,226,066	*1,448,884*	3,403,529	*1,218,379* *
Director age	57.83	*59*	57.418	*60*	58.25	*59*
Segments	4.248	*3.9*	4.486	*4*	4.16	*3.8*
Information asymmetry	0.235	*0.125*	0.239	*0.123*	0.232	*0.131*
Product market concentration	0.613	*0.452*	0.624	*0.504*	0.593	*0.434*
Tobin's Q (year -1)	1.673	*1.400*	1.734	*1.483*	1.613	*1.344*
Return on Assets (year -1)	0.177	*0.148*	0.161	*0.157*	0.193	*0.135*
Market to Book ratio	2.042	*1.484*	2.125	*1.567*	1.959	*1.411*

Panel B: Comparison of parent firm CEOs and Division CEOs

	Full Sample (N = 109)		Parent firm CEOs (N = 79)		Division CEOs (N = 30)	
	Mean	Median	Mean	Median	Mean	Median
Number of financial experts	57		44		13	
Leverage	0.261	0.262	0.261	0.279	0.260	0.256
Operating cash flow / Assets	0.142	0.137	0.141	0.137	0.144	0.137
Cash & Investment / Assets	0.165	0.114	0.162	0.116	0.173	0.113
Payout ratio	0.503	0.375	0.446	0.356	0.652	0.462
R&D intensity (%)	0.049	0.000	0.050	0.000	0.047	0.000
PPE intensity (%)	0.313	0.256	0.333	0.259	0.263	0.239
Capital expenditure / Sales	0.065	0.052	0.067	0.051	0.062	0.056
Cash / Assets	0.109	0.047	0.103	0.047	0.124	0.048
Firm Size: Parent	28,554	2,619	26,586	2,581	33,734*	2,748
Firm Size: spun-off unit (year +1)	6,539	666	6,015	652	7,918	701
Relative size 1 (Market value of assets)	0.383	0.272	0.423	0.294	0.273 *	0.253*
Relative size 2 (Total assets)	0.229	0.254	0.226	0.253	0.235	0.255
Board size	10.266	10.000	10.228	9.000	10.367	11.000
Outside directors (%)	0.783	0.800	0.781	0.818	0.788	0.793
Non-Busy directors (%)	0.668	0.667	0.706	0.667	0.565	0.575
Insider ownership	9.387	4.000	10.078	4.000	7.567	3.840
Outside block ownership (%)	13.172	11.200	15.224	14.900	7.769***	5.850
CEO total compensation	3,226,066	1,448,884	2,524,740	1,304,867	5,072,891*	1,846,924
Segments	4.486	4	4.304	4.3	4.966	4.0
Distance	647.1	309.0	639.5	231.0	667.3 *	404.0 **
Publicly traded units b/f spin-offs	29		18		11	
Product market concentration (spun-off unit)	0.622	0.502	0.654	0.533	0.575	0.443
Information asymmetry	0.239	0.208	0.236	0.206	0.240	0.211
Tobin's Q (year -1)	1.734	1.483	1.709	1.556	1.801	1.393
Return on Assets (year-1)	0.161	0.157	0.157	0.160	0.172	0.152
Market to Book ratio	2.125	1.567	2.009	1.667	2.428	1.478
Same industry spin-off (FF 48)	20		15		5	
Same industry spin-off (SIC 3)	28		20		8	

Table 2.3: Abnormal returns on spin-off announcement

This table presents the three-day cumulative abnormal returns, CAR (-1, +1), where day 0 is the spin-off announcement date for a sample of 109 firms that completed spin-offs over the sample period from 1994 to 2009. The cumulative abnormal returns are adjusted by three different models: market model, Fama-French three factors and the Fama-French three factors and momentum factor model. Panel A compares spin-off firms' abnormal returns on spin-off announcement to non-spin-off firms. Panel B shows the mean (median) of abnormal spin-off announcement returns for 79 parent firm CEOs and 30 division CEOs. In Panel C, CEOs at spun-off units are classified as financial and non-financial experts. There are 57 financial expert CEOs and 52 non-financial experts. Two-sample t-tests are conducted to compare the difference of means of samples in Panel A and Panel B. Statistical significance at the 1%, 5%, and 10% level is indicated by ***,**, and *, respectively.

Panel A: spin-off announcement returns for spin-offs firms and non-spin-offs

	CAR (-1,1)	CAR (-1,1) Fama-French	CAR (-1,1) Fama-French & Momentum
Spin-off firms (N=109)			
Mean	3.649 **	3.511 **	3.371 **
Median	2.840 **	2.390 **	2.435 **
Non spin-off firms (N=109)			
Mean	0.762	0.632	0.599
Median	0.001	0.001	0.001
Difference			
Mean	2.923 **	2.879 **	2.772 **

Panel B: spin-off announcement returns for parent firm CEOs and division CEOs

	CAR (-1,1)	CAR (-1,1) Fama-French	CAR (-1,1) Fama-French & Momentum
Parent firm CEOs (N=79)			
Mean	4.256 **	4.062 **	3.870 **
Median	3.744 *	2.804 *	2.929 *
Division CEOs (N=30)			
Mean	2.051*	2.059*	2.057*
Median	1.259*	1.201*	1.114*
Difference			
Mean	2.205*	2.003*	1.813*

Panel C: spin-off announcement returns for financial expert CEOs and non-financial expert CEOs

	CAR (-1,1)	CAR (-1,1) Fama-French	CAR (-1,1) Fama-French & Momentum
Financial Expert CEOs (N=57)			
Mean	5.879 **	5.758 **	5.499 **
Median	3.625 **	3.026 **	2.985 **
Non-Financial Expert CEOs (N=52)			
Mean	1.203 **	1.048 *	1.038 *
Median	0.986 *	0.906 *	0.900 *
Difference			
Mean	4.675 **	4.710 **	4.460 **

Table 2.4: Regression of parent firm CEOs, division CEOs, and financial experts on abnormal returns on spin-off announcement

This table reports regression estimates of the impact of parent firm CEOs, division CEOs and financial expert CEOs on spin-off announcement abnormal returns. Dependent variable is the cumulative abnormal announcement returns (i.e.CAR (-1,+1)). Spun off units' growth opportunities are the ratio of research and development expenditure to the book value of assets at year-end (R&D) during the three years preceding the spin-off announcement. t-statistics based on robust standard errors and clustered by year and firm are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is indicated by ***,**, and *, respectively.

	CAR (-1,1)		CAR (-1,1) Fama-French		CAR (-1,1) Fama-French & Momentum	
	(1)	(2)	(3)	(4)	(5)	(6)
Parent firm CEOs (PE)	0.022*		0.024*		0.023*	
	(1.82)		(1.75)		(1.70)	
Financial Expert (FE)	0.005**	0.021**	0.006**	0.019**	0.010**	0.020**
	(2.18)	(2.03)	(2.21)	(2.08)	(2.38)	(2.07)
PE × FE	-0.026		-0.025		-0.030	
	(-0.92)		(-0.92)		(-0.90)	
Division CEOs (DM)		-0.022*		-0.024*		-0.023*
		(-1.82)		(-1.75)		(-1.70)
DM × FE		0.026**		0.025**		0.030**
		(2.22)		(2.22)		(2.10)
Growth opportunities- R&D	0.002*	0.002*	0.003**	0.003**	0.002*	0.002*
	(1.75)	(1.75)	(2.29)	(2.29)	(1.88)	(1.88)
Information asymmetry	-0.006	-0.006	0.010	0.010	-0.022	-0.022
	(-0.09)	(-0.09)	(0.13)	(0.13)	(-0.37)	(-0.37)
Average changes in Tobin's Q (-2)	0.029	0.029	0.029	0.029	0.029	0.029
	(1.25)	(1.25)	(1.27)	(1.27)	(1.31)	(1.31)
Same industry spin-off (FF 48)	-0.009	-0.009	-0.015	-0.015	-0.013	-0.013
	(-0.69)	(-0.69)	(-1.29)	(-1.29)	(-1.06)	(-1.06)
Independent directors (%)	0.053	0.053	0.048	0.048	0.049	0.049
	(1.37)	(1.37)	(1.17)	(1.17)	(1.21)	(1.21)
Non-busy directors (%)	0.015	0.015	0.013	0.013	0.010	0.010
	(0.84)	(0.84)	(0.79)	(0.79)	(0.63)	(0.63)
Insider ownership	0.002	0.002	0.002	0.002	0.002	0.002
	(1.52)	(1.52)	(1.62)	(1.62)	(1.66)	(1.66)
Outside block ownership	0.000**	0.000**	0.000***	0.000***	0.000***	0.000***
	(2.45)	(2.45)	(3.23)	(3.23)	(3.18)	(3.18)
Segment	0.045**	0.045**	0.045**	0.045**	0.041**	0.041**
	(1.98)	(1.98)	(2.10)	(2.10)	(2.01)	(2.01)
Publicly traded units b/f spin-offs	-0.009	-0.009	-0.002	-0.002	-0.006	-0.006
	(-0.37)	(-0.37)	(-0.09)	(-0.09)	(-0.28)	(-0.28)
Relative size 1	0.010	0.010	0.008	0.008	0.010	0.010
	(0.70)	(0.70)	(0.51)	(0.51)	(0.60)	(0.60)
Leverage	-0.042	-0.042	-0.040	-0.040	-0.033	-0.033
	(-0.86)	(-0.86)	(-0.74)	(-0.74)	(-0.66)	(-0.66)
PPE intensity (%)	-0.043	-0.043	-0.034	-0.034	-0.035	-0.035
	(-1.56)	(-1.56)	(-1.27)	(-1.27)	(-1.23)	(-1.23)
R&D intensity (%)	0.096	0.096	0.091	0.091	0.086	0.086
	(1.73)	(1.73)	(1.55)	(1.55)	(1.38)	(1.38)
Intercept	-0.111	-0.059	-0.117	-0.064	-0.106	-0.053
	(-2.63)	(-1.47)	(-2.58)	(-1.56)	(-2.56)	(-1.52)
Adjusted R2	0.09	0.09	0.109	0.109	0.105	0.105
N	109	109	109	109	109	109
Cluster Year/firm	Yes	Yes	Yes	Yes	Yes	Yes

Table 2.5: Univariate tests of changes in external financing

This table reports the difference of and changes in abnormal external financing activities in a sample of 109 spin-offs and non-spin-offs in Panel A and 79 parent firm CEOs and 30 division CEOs in Panel B. Panel C shows the difference in dollar amount of external financing by financial experts in our sample. In order to measure the amount of net equity and the net debt issued, we follow the methods suggested by Hovakimian et al. (2001, 2004). The last two columns, (5) and (6), in Panel A and B present the changes and average two-year changes of external financing before and after spin-offs. The mean and median dollar amount of equity and debt are specified in millions of dollars. We classify the following types of parent firm CEOs and division CEOs as financial experts: directors serving on the audit committees or in financial institutions before the spin-off announcement and financial industry experience for current or past employment in a financial firm (SIC 6000-6999) suggested by Fracassi and Tate (2012) and Guner et al. (2008). Two-sample t-tests are conducted to compare the difference of means between samples. Statistical significance at the 1%, 5%, and 10% level is indicated by ***,**, and *, respectively.

Panel A: Differences in external capital raised by between spin-off and its matching firms

		(1)	(2)	(3)	(4)	(5)	(6)
	Year	-2	-1	1	2	Δ(-1, +1)	Δ (-2, +2)
Spin-offs	Equity	27.250	30.581	99.391	51.627	68.810*	46.594*
N =109	Debt	163.599	144.106	248.291	324.885	104.185**	132.735**
	Total	190.849	174.686	347.681	376.512	172.995 **	179.329 **
Non –spin-offs	Equity	36.904	28.132	34.351	14.044	6.219	-8.321
N =109	Debt	186.411	153.166	168.972	195.920	15.806	12.657
	Total	223.315	181.298	203.322	209.963	22.024	4.336
Difference	Equity	-9.654	2.448	65.040**	37.584*	62.591**	54.914**
	Debt	-22.812	-9.060	79.319**	128.965**	88.379**	120.078**
	Total	-32.466	-6.612	144.359**	166.549**	150.971 **	174.993 **

Panel B: Differences in external capital raised by between parent firm CEOs and division CEOs

		(1)	(2)	(3)	(4)	(5)	(6)
		-2	-1	1	2	Δ (-1, +1)	Δ (-2, +2)
Parent firm CEOs N = 79	Equity	-9.923	1.736	70.365	54.245	68.629*	66.398*
	Debt	-23.504	-10.690	99.235	148.369	109.925*	140.899*
	Total	-33.426	-8.954	169.600	202.614	178.554*	207.297*
Division manager CEOs N =30	Equity	-8.946	4.324	21.017	-6.291	56.693	24.674*
	Debt	-20.990	-4.769	26.874	77.867	31.643*	65.250*
	Total	-29.937	-0.445	77.890	71.576	78.336*	89.924*
Difference	Equity	-0.976	-2.578	19.348	60.536	21.936	41.724
	Debt	-2.513	-5.921	72.361	70.502	78.283*	75.649*
	Total	-3.490	-8.509	91.710	131.038	100.218*	117.373*

Panel C: The amount of external capital raised by financial and non-financial experts

Δ Year (-1,1)

	Total external financing		Equity financing		Debt financing	
	Financial expert CEOs	Non-financial expert CEOs	Financial expert CEOs	Non-financial expert CEOs	Financial expert CEOs	Non-financial expert CEOs
Parent firm CEOs	N = 44	N = 35	N = 44	N = 35	N = 44	N = 35
	205.581**	144.577	82.325**	38.839	113.256**	105.738
Division manager CEOs	N =13	N =17	N =13	N =17	N =13	N =17
	161.975*	14.376	51.546	42.982	110.429**	-28.606
Total	195.636**	102.011	83.025*	40.194	112.611**	61.818

Δ Year (-2,2)

	Total external financing		Equity financing		Debt financing	
	Financial expert CEOs	Non-financial expert CEOs	Financial expert CEOs	Non-financial expert CEOs	Financial expert CEOs	Non-financial expert CEOs
Parent firm CEOs	N = 44	N = 35	N = 44	N = 35	N = 44	N = 35
	228.953**	180.072	80.632*	48.504	148.321	131.568
Division manager CEOs	N =13	N =17	N =13	N =17	N =13	N =17
	194.479*	9.971	51.258*	4.345	143.221**	5.625
Total	221.091**	124.462	73.933**	34.068	147.158**	90.395

Table 2.6: Regression of financial expertise on abnormal changes in external capital

This table reports regression estimates of the impacts of financial expertise on abnormal changes in external financing activities. Full sample consists of 109 firms that completed spin-offs in the period 1994 to 2009 including 79 parent firm CEOs and 30 division CEOs. The dependent variable is the change in industry-adjusted external financing before and after spin-off. Industry-adjusted external financing is the difference between 109 spin-off and non-spin-offs. T-statistics based on robust standard errors and clustered by year and firms are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is indicated by ***,**, and *, respectively.

Panel A: Abnormal changes in external financing activities ($); ΔYear (-1, +1)

	(1)	(2)	(3)	(4)
Parent firm CEOs (PE)	1.775**		2.021*	
	(2.25)		(2.24)	
Financial Expert (FE)		2.593**	4.665**	1.880**
		(2.32)	(2.00)	(2.02)
PE × FE			-2.785	
			(-0.44)	
Division CEOs (DM)				-2.021**
				(-2.12)
DM × FE				2.785**
				(2.46)
Growth opportunities- R&D	0.176	0.368	0.277	0.277
	(1.16)	(1.38)	(1.28)	(1.33)
Information asymmetry	0.141	0.841	0.697	0.697
	(0.26)	(0.63)	(0.59)	(0.34)
Average changes in Tobin's Q (-2)	1.178	1.175	1.237	1.237
	(1.10)	(1.01)	(1.03)	(1.31)
Same industry spin-off (FF 48)	-0.448	-0.518	-0.545	-0.545
	(-0.28)	(-0.35)	(-0.36)	(-0.48)
Independent directors (%)	3.337	4.373*	4.421*	4.421**
	(1.42)	(1.69)	(1.71)	(2.07)
Non-busy directors (%)	0.238	0.191	0.409	0.409
	(0.28)	(0.22)	(0.39)	(0.48)
Insider ownership	-0.022	-0.024	-0.022	-0.022
	(-0.80)	(-1.17)	(-1.02)	(-0.76)
Outside block ownership	0.002**	0.002**	0.002**	0.002**
	(2.54)	(2.18)	(2.14)	(2.20)
Segment	-1.021	-1.322	-1.098	-1.098
	(-1.09)	(-1.28)	(-1.08)	(-1.09)
Publicly traded units b/f spin-offs	-1.263	-1.286	-1.32	-1.32
	(-1.26)	(-1.10)	(-1.13)	(-1.47)
Relative size 1 (Market Value assets)	1.023	1.063	0.94	0.94
	(1.50)	(1.40)	(1.23)	(1.28)
Leverage	-0.549	-0.721	-1.269	-1.269
	(-0.23)	(-0.33)	(-0.61)	(-0.60)
PPE intensity (%)	0.433	-0.224	-0.308	-0.308
	(0.18)	(-0.09)	(-0.12)	(-0.15)
R&D intensity (%)	2.692	2.004	2.243	2.243
	(0.75)	(0.49)	(0.55)	(0.58)
Intercept	0.291	0.029	-1.616	0.045
	(0.09)	(0.01)	(-0.52)	(0.14)
Adjusted R2	0.026	0.077	0.09	0.09
N	109	109	109	109
Robust	Yes	Yes	Yes	Yes
Cluster Year/firm	Yes	Yes	Yes	Yes

Panel B: Abnormal changes in external financing activities ($); ΔYear (-2, +2)

	(1)	(2)	(3)	(4)
Parent firm CEOs (PE)	1.384**		1.614**	
	(1.97)		(2.11)	
Financial Expert (FE)		2.437**	4.474**	1.786**
		(2.29)	(2.07)	(1.96)
PE × FE			-2.688	
			(-0.21)	
Division CEOs (DM)				-1.614*
				(-1.74)
DM × FE				2.688**
				(2.44)
Growth opportunities- R&D	0.42	0.893*	0.667	0.667*
	(1.32)	(1.70)	(1.52)	(1.71)
Information asymmetry	0.817	0.973	0.844	0.844
	(0.00)	(0.80)	(0.63)	(0.76)
Average changes in Tobin's Q (-2)	2.305	2.068	2.238	2.238
	(1.49)	(1.40)	(1.39)	(1.59)
Same industry spin-off (FF 48)	-1.082	-1.09	-1.139	-1.139
	(-0.84)	(-0.86)	(-0.87)	(-1.06)
Independent directors (%)	2.743	3.177	3.242	3.242
	(0.82)	(0.93)	(0.94)	(1.29)
Non-busy directors (%)	0.778	0.311	0.795	0.795
	(0.78)	(0.39)	(0.71)	(0.82)
Insider ownership	-0.022	-0.024	-0.019	-0.019
	(-1.09)	(-1.10)	(-0.90)	(-0.52)
Outside block ownership	0.000	0.001	0.000	0.000
	(1.52)	(1.82)	(1.19)	(1.17)
Segment	0.253	0.008	0.400	0.400
	(0.21)	(0.01)	(0.35)	(0.32)
Publicly traded units b/f spin-offs	0.251	0.12	0.099	0.099
	(0.16)	(0.08)	(0.06)	(0.07)
Relative size 1 (Market Value assets)	0.382	0.734	0.436	0.436
	(0.41)	(0.72)	(0.44)	(0.54)
Leverage	-2.239	-2.143	-3.081	-3.081
	(-0.92)	(-0.95)	(-1.37)	(-1.17)
PPE intensity (%)	1.863	2.082	1.813	1.813
	(0.89)	(1.11)	(0.81)	(0.73)
R&D intensity (%)	4.752	4.433	4.841	4.841
	(1.02)	(0.86)	(0.97)	(0.87)
Intercept	0.426	-0.021	-1.306	0.309
	(0.15)	(-0.01)	(-0.45)	
Adjusted R2	0.013	-0.049	0.019	0.019
N	109	109	109	109
Robust	Yes	Yes	Yes	Yes
Cluster Year/firm	Yes	Yes	Yes	Yes

Table 2.7: Univariate tests of changes in operating cash flow returns

This table presents the difference and the changes in operating cash flows returns for 109 spin-offs and non-spin-offs in Panel A and 79 parent firm CEOs and 30 division CEOs in Panel B. Panel C shows the difference and the changes in operating cash flows returns by spun-off unit CEOs with financial expertise in our sample. Operating cash flows are measured by two different methods suggested by Denis and McKoen (2012) as Operating Cash Flow (1) and Chemmanur et al. (2010) as Operating Cash Flow (2) and each firm's operating cash flow is scaled by its total assets. Years -1 and -2 are measured relative to the year of spin-off announcement, while Year +1 and +2 are measured relative to the year of spin-off execution. Year (-1, +1) and Year (-2, +2) present the changes in one-year and in average two-years of operating cash flows around spin-offs. Two-sample t-tests (Wilcoxon-Mann-Whitney tests) are conducted to compare the difference of means (medians) of samples. Statistical significance at the 1%, 5%, and 10% level is indicated by ***,**, and *, respectively.

Panel A: Operating cash flow return between spin-off firms and non-spin-off firms

Operating Cash Flow (1) / Assets

	Year -2	Year -1	Year +1	Year +2	Δ Year (-1, +1)	Δ Year (-2, +2)
Spin-off firms						
Mean	0.112	0.111	0.122	0.124	0.011**	0.012*
Median	0.108	0.108	0.134	0.125	0.020**	0.019**
N = 109						
Non-spin-off firms						
Mean	0.110	0.110	0.106	0.106	-0.004	-0.004
Median	0.111	0.110	0.101	0.106	-0.009*	-0.007
N = 109						
Difference						
Mean	0.002	0.001	0.016**	0.018*	0.015**	0.015*

Operating Cash Flow (2) / Assets

	Year -2	Year -1	Year +1	Year +2	Δ Year (-1, +1)	Δ Year (-2, +2)
Spin-off firms						
Mean	0.133	0.135	0.144	0.145	0.009**	0.011*
Median	0.130	0.134	0.149	0.147	0.015*	0.016*
N = 109						
Non-spin-off firms						
Mean	0.132	0.134	0.130	0.132	-0.004	-0.002
Median	0.133	0.137	0.129	0.130	-0.009*	-0.006
N = 109						
Difference						
Mean	0.001	0.001	0.014*	0.013**	0.013**	0.013*

Panel B: Operating cash flow returns between parent firm CEOs and division CEOs

Operating Cash Flow (1) / Assets

	Year -2	Year -1	Year +1	Year +2	Δ Year (-1, +1)	Δ Year (-2, +2)
Parent firm CEOs						
Mean	0.003	0.001	0.019	0.022	0.018*	0.018*
Median	0.002	-0.001	0.010	0.010	0.011*	0.010*
N = 79						
Division CEOs						
Mean	-0.001	0.001	0.008	0.007	0.007*	0.007*
Median	0.000	-0.001	0.004	0.003	0.005	0.003
N = 30						
Difference						
Mean	0.003	0.000	0.011	0.015*	0.011*	0.011*

Operating Cash Flow (2) / Assets

	Year -2	Year -1	Year +1	Year +2	Δ Year (-1, +1)	Δ Year (-2, +2)
Parent firm CEOs						
Mean	0.001	0.001	0.017	0.017	0.016*	0.016*
Median	0.001	0.000	0.012	0.012	0.012*	0.010*
N = 79						
Division CEOs						
Mean	0.001	-0.001	0.004	0.003	0.005*	0.003
Median	0.000	0.001	0.003	0.002	0.002	0.002
N = 30						
Difference						
Mean	0.000	0.002	0.014*	0.014**	0.011*	0.013*

Panel C: Operating cash flow returns between financial experts and non-financial experts

Δ Year (-1,1)

	Operating Cash Flow / Assets (1)		Operating Cash Flow / Assets (2)	
	Financial expert	Non-financial expert	Financial expert	Non-financial expert
Parent firm	N = 44	N = 35	N = 44	N = 35
CEOs	0.021**	0.014	0.020**	0.011
Division	N = 13	N =17	N =13	N =17
CEOs	0.016*	0.000	0.010*	0.001
Total	0.020 **	0.009	0.018 *	0.008

Δ Year (-2,2)

	Operating Cash Flow / Assets (1)		Operating Cash Flow / Assets (2)	
	Financial expert	Non-financial expert	Financial expert	Non-financial expert
Parent firm	N = 44	N = 35	N = 44	N = 35
CEOs	0.022**	0.014	0.019*	0.012
Division	N =13	N =17	N =13	N =17
CEOs	0.016*	0.001	0.008*	0.000
Difference	0.021 **	0.010	0.016 *	0.010

Table 2.8: Regression of parent firm CEOs' impact on abnormal changes in operating cash flows returns

This table presents the results of OLS regression of changes in abnormal operating cash flows on parent firm CEOs and other controls. Full sample consists of 109 firms that completed spin-offs in the period 1994 to 2009, including 79 firms assigning one of its executives as CEO of the spun-off unit (i.e. parent firm CEOs) and 30 firms appointing former division head as CEO of the spun-off unit (i.e. division CEOs). In addition, 109 spin-off samples are classified as spun-off unit CEOs with financial expertise and non-financial expertise. Dependent variable is the change in abnormal operating cash flow returns measured in two different ways suggested by Denis and McKeon (2012) as OCF (1) and Chemmanur et al. (2010) as OCF (2). Abnormal operating cash flows are the difference between spin-offs' and matching non-spin-offs' operating cash flows. T-statistics based on robust standard errors and clustered by year and firms are reported in parentheses. Statistical significance at the 1%, 5%, and 10% level is indicated by ***,**, and *, respectively.

Panel A: Parent firm CEOs' impact on abnormal changes in operating cash flow (1) returns

	Δ Operating Cash Flow / Assets (-1, +1)		Δ Operating Cash Flow / Assets (-2, +2)	
	(1)	(2)	(3)	(4)
Parent firm CEOs (PE)	0.091**		0.089**	
	(1.96)		(1.99)	
PE × FE	-0.119		-0.108	
	(-0.72)		(-0.69)	
Financial Expert (FE)	0.054*	0.066*	0.047**	0.061*
	(1.74)	(1.67)	(1.97)	(1.64)
Division CEOs (DM)		-0.091**		-0.089**
		(-1.96)		(-1.99)
DM × FE		0.119*		0.108**
		(1.92)		(1.99)
Growth opportunities- R&D	0.002	0.002	0.003	0.003
	(0.42)	(0.42)	(0.68)	(0.68)
Information asymmetry	-0.037	-0.037	-0.079	-0.079
	(-0.15)	(-0.15)	(-0.30)	(-0.30)
Average changes in Tobin's Q (-2)	-0.015	-0.015	-0.004	-0.004
	(-0.14)	(-0.14)	(-0.04)	(-0.04)
Same industry spin-off (FF 48)	-0.089	-0.089	-0.093	-0.093
	(-1.30)	(-1.30)	(-1.34)	(-1.34)
Independent directors (%)	0.071	0.071	0.092	0.092
	(0.50)	(0.50)	(0.61)	(0.61)
Non-busy directors (%)	0.024	0.024	0.024	0.024
	(0.24)	(0.24)	(0.23)	(0.23)
Insider ownership	-0.005	-0.005	-0.005	-0.005
	(-0.93)	(-0.93)	(-0.92)	(-0.92)
Outside block ownership	0.000	0.000	0.000	0.000
	(-0.27)	(-0.27)	(0.88)	(0.88)
Segment	0.019	0.019	0.027	0.027
	(0.46)	(0.46)	(0.67)	(0.67)
Publicly traded units b/f spin-offs	-0.038	-0.038	-0.048	-0.048
	(-0.38)	(-0.38)	(-0.50)	(-0.50)
Relative size 1	-0.202	-0.202	-0.210	-0.210
	(-0.90)	(-0.90)	(-0.95)	(-0.95)
Leverage	0.218	0.218	0.161	0.161
	(0.76)	(0.76)	(0.57)	(0.57)
PPE intensity (%)	-0.053	-0.053	-0.043	-0.043
	(-0.64)	(-0.64)	(-0.52)	(-0.52)
R&D intensity (%)	0.127	0.127	0.236	0.236
	(0.53)	(0.53)	(1.10)	(1.10)
Intercept	-0.052	0.039	-0.050	0.039
	(-0.30)	(0.26)	(-0.27)	(0.23)
Adjusted R2	0.027	0.027	0.04	0.04
N	109	109	109	109
Cluster Year/firm	Yes	Yes	Yes	Yes

Panel B: Parent firm CEOs' impact on abnormal changes in operating cash flow (2) returns

	Δ Operating Cash Flow / Assets (-1, +1)		Δ Operating Cash Flow / Assets (-2, +2)	
	(1)	(2)	(3)	(4)
Parent firm CEOs (PE)	0.122*		0.123*	
	(1.92)		(1.91)	
PE × FE	-0.189		-0.160	
	(-0.88)		(-0.72)	
Financial Expert (FE)	0.100*	0.088*	0.074*	0.086*
	(1.71)	(1.89)	(1.65)	(1.64)
Division CEOs (DM)		-0.122*		-0.089**
		(-1.92)		(-1.99)
DM × FE		0.189**		0.108**
		(1.98)		(1.99)
Growth opportunities- R&D	0.002	0.002	0.004	0.003
	(0.33)	(0.33)	(0.58)	(0.68)
Information asymmetry	-0.024	-0.024	-0.041	-0.079
	(-0.07)	(-0.07)	(-0.12)	(-0.30)
Average changes in Tobin's Q (-2)	-0.051	-0.051	-0.042	-0.004
	(-0.45)	(-0.45)	(-0.36)	(-0.04)
Same industry spin-off (FF 48)	-0.110	-0.110	-0.109	-0.093
	(-1.32)	(-1.32)	(-1.28)	(-1.34)
Independent directors (%)	0.126	0.126	0.115	0.092
	(0.94)	(0.94)	(0.81)	(0.61)
Non-busy directors (%)	0.047	0.047	0.042	0.024
	(0.40)	(0.40)	(0.37)	(0.23)
Insider ownership	-0.004	-0.004	-0.004	-0.005
	(-0.70)	(-0.70)	(-0.65)	(-0.92)
Outside block ownership	0.000	0.000	0.000	0.000
	(0.29)	(0.29)	(0.89)	(0.88)
Segment	0.073	0.073	0.079	0.027
	(1.40)	(1.40)	(1.45)	(0.67)
Publicly traded units b/f spin-offs	-0.050	-0.050	-0.060	-0.048
	(-0.46)	(-0.46)	(-0.55)	(-0.50)
Relative size 1	-0.210	-0.210	-0.220	-0.21
	(-0.85)	(-0.85)	(-0.91)	(-0.95)
Leverage	0.119	0.119	0.068	0.161
	(0.36)	(0.36)	(0.21)	(0.57)
PPE intensity (%)	-0.040	-0.040	-0.023	-0.043
	(-0.45)	(-0.45)	(-0.25)	(-0.52)
R&D intensity (%)	0.284	0.284	0.307	0.236
	(1.07)	(1.07)	(1.19)	(1.10)
Intercept	-0.185	-0.063	-0.161	0.039
	(-0.82)	(-0.33)	(-0.72)	(0.23)
Adjusted R2	0.019	0.019	0.022	0.04
N	109	109	109	109
Cluster Year/firm	Yes	Yes	Yes	Yes

Appendix: Definition of variables

Total assets - The fiscal year-end total assets.

Firm size - Multiplying the shares outstanding by the closing price at the end of fiscal year.

StockReturn - The cumulative stock return over the last 12 months.

Leverage - The ratio of book value of total debt to book value of total assets.

Turnover - The average of monthly ratios of the number of shares traded to the number of shares outstanding during the last 12 months.

Cash flow – The Ratio of earnings less interest and taxes to firm's book assets.

Leverage - The ratio of book value of total debt to book value of assets

Return on assets - The ratio of earnings before interest, taxes, depreciation, and amortization to the book value of total assets

Board size - The number of board directors in the proxy statement

Outside directors - The ratio of outside directors who are not employees of the firm to board size

Non-busy directors - The ratio of directors who holds less than three directorships at other firms to board size

Insider ownership - The fraction of outstanding shares held by directors and executive officers

Outside block ownership - The fraction of outstanding shares owned by institutional investors in the proxy statement. An institutional investor is defined as a shareholder who holds more than 5% of outstanding shares

CEO total compensation - The sum of cash pay and equity-based pay

Director age - The age in years when parent firms announce the spin-off

Information asymmetry - The standard deviation of the three-day abnormal returns around the announcement of quarterly earnings during the three years preceding the announcement of the spin-off

Product market concentration - Herfindahl index based on each firm's asset

Relative size 1 (2) - The market value of assets (total assets) of spun-off units measured in the year succeeding the spin-off execution (year +1) over parent firms' market value of assets (total assets) measured in year -1

Publicly traded units b/f spin-offs - The number of spun-off units that were already publicly traded before the spin-off announcement

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