Dual Ownership and Managerial Compensation Incentives

Tao Chen   Li Zhang   Qifei Zhu[*]

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Abstract

This paper studies how conflicts between equity holders and bond holders affect corporate managerial compensation structure. Firms with institutional investors who simultaneously hold equity and bond of the firm ("dual holders") implement compensation policies with lower sensitivities to stock price volatility ("vega"). We use mergers between financial institutions to identify the causal impact of dual ownership on compensation incentives. Furthermore, shareholder voting records reveal voting as an important channel through which dual ownership influences managerial contracts.

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[*]Nanyang Business School, Nanyang Technological University.

Financial economists have long recognized that shareholders and creditors have divergent preferences over how much risks a firm should take (Jensen and Meckling (1976); Myers (1977); Smith and Warner (1979)). In the good states of the world, shareholders capture most of the upside of risky investments. In the bad states, shareholders are protected by limited liabilities, and creditors disproportionally bear the costs. Such conflict of interest between shareholders and debt holders induces shareholders to increase firm risks by, for example, risk-shifting or asset substituting. This in turn elevates the ex ante cost of debt and reduces firm value.

Shareholders, however, typically do not decide and implement a firm's risk-taking policies directly; managers do. Because of their undiversified labor income risk, corporate managers may not be willing to seek risks (Smith and Stulz (1985). Therefore, shareholders may need to award equity-based compensation, especially stock options, to managers in order to induce risk-taking (Guay (1999); Coles, Daniel, and Naveen (2006); Low (2009); Gormley, Matsa, and Milbourn (2013)). Such convex compensation structure, however, is shown to negatively affect the value of bondholders (DeFusco, Johnson, and Zorn (1990)). Therefore, it is naturally to conjecture that, if creditors were given the opportunity to write a contract with managers, they would prefer a less risk-inducing managerial compensation than shareholders do.

Contracting with managers, of course, is within the purview of shareholders. However, many shareholders in today's financial market have exposure to the value of the firm's debt. An equity mutual fund, for example, usually belongs to a financial conglomerate (e.g., a mutual fund family) that also hold bond positions of the same firm through its subsidiaries. Such institutions are dubbed "dual holders" of the company (Jiang, Li, and Shao (2010)). Although individual mutual funds supposedly have fiduciary duty to their own investors, past studies have documented ample evidence that funds within a family cross-subsidize to maximize the value of the whole group (e.g., Gaspar, Massa, and Matos (2005); Bhattacharya, Lee, and Pool (2013)). In ad-

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dition, many asset managers, for example Blackrock and Vanguard, have centralized corporate governance team at the investment company-level, dedicated to handling voting and other corporate governance matters.[1]

If dual holders intend to maximize the value of their equity *and* debt holdings, we hypothesize that they prefer a less risk-inducing managerial contract than *pure* equity holders do. To empirically evaluate this hypothesis, this paper examines the relation between a firm's level of dual ownership and the structure of executive compensation. Since dual holders would prefer managers takes less risks than pure equity holders do, we expect a negative relation between dual ownership and the sensitivity of managerial compensation with respect to stock price volatility ("vega").

We classify financial institutions at the financial conglomerate level, following Bodnaruk and Rossi (2016). Financial conglomerates are the ultimate parent firms that an institution (such as a mutual fund) belongs to. When a financial conglomerate holds both equities and bonds of the same firm above a certain threshold, it is identified as a *significant dual holder* of the firm.[2] Using a sample of U.S. public companies between 2006 and 2016, we show that one additional significant dual holder decreases CEO vega, as defined in Core and Guay (2002), by 0.15 percentage point relative to the total compensation level, or 5 percent of the sample-average CEO vega. It also decreases the use of option grants by 0.82 percentage point relative to the annual total compensation. Moreover, the impact of dual holders seems to be proportional to the amount of equity and debt they hold, potentially reflecting their stronger voting power (in the case of equity holding) or stronger risk-reducing motives (in the case of debt holding). The impact of dual ownership on managerial compensation is particularly pronounced for firms that are closer to financial distress.

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[1] "BlackRock, Vanguard and State Street bulk up governance staff", January 29, 2017, *Financial Times*

[2] In the baseline specifications, We require significant dual holders to hold at least 0.5% of the firm's equity and at least 0.5% of the firm's bond. Our results are robust to alternative threshold levels.

These results are interesting in the light of a growing literature on dual owner-ship, which shows that the presence of dual holders reduces corporate risk-shifting by lowering equity payouts (Chu (2018)), increasing the probability of being acquired (Bodnaruk and Rossi (2016)), and cutting corporate innovation (Yang (2019)).[3] A question facing this nascent literature is through what channel do dual holders reduce corporate risk-taking? Many corporate policies, such as dividend payout or risky investments, are under the discretion of corporate managers. Our findings complement these studies by suggesting a channel of dual holders' influences: they tweak managerial incentives so that managers' interests are more align with creditors'.

One concern for interpreting the baseline results is that the ownership structure of a firm is endogenous. For example, equity holders may choose to simultaneously acquire bond positions knowing that the executive compensation has a low vega and discourages managerial risk-taking. To address such endogeneity concern, we exploit formations of dual holders that are induced by mergers of financial institutions, similar to Chu (2018). Consider a financial conglomerate that holds a substantial percentage of stocks of a firm but no bond. If this institution merges with another financial institution that holds a substantial percentage of bonds of the same firm (but no equity), the combined entity becomes a significant dual holder of the firm after the merger. The decisions of such mergers are usually dictated by the business synergy of the acquirer and target, and are plausibly exogenous to the fundamentals of the particular portfolio companies. If firms that gain significant dual holders in such mergers subsequently change the compensation structure, we can attribute the managerial incentive changes to the influence of dual holders.

A difference-in-differences analysis with control firms matched on several characteristics (Hong and Kacperczyk (2010); Chu (2018)) reveals that firms that gain significant dual holders during financial company mergers reduce their use of option

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[3]The literature also show that the mitigation in shareholder-creditor conflict also reduces the cost of debt and the use of covenants ex ante (Jiang et al. (2010); Chava, Wang, and Zou (2019)).

grants and CEO vega significantly after the mergers, as compared with control firms. Moreover, the results are mainly driven by an absolute decrease in CEO vega of the treatment firms rather than changes in that of control firms. These results suggest that the impact of dual ownership on managerial compensation is plausibly causal.

What is the channel through which dual holders affect executive compensation structure? We shed light on this question by examining shareholder voting records on proposals related to executive compensation. Since it is difficult to classify proposals as vega-increasing or vega-decreasing ex ante, we focus on the subset of proposals that are passed and classify them based on whether the compensation vega increases or decreases ex post. We then compare the voting pattern of mutual funds who are dual holders of the company with the voting pattern of other funds. If dual holders utilize shareholder voting as the main mechanism to influence executive incentives, we expect dual holders to be more likely to vote against vega-increasing proposals and vote for vega-decreasing proposals.

This is precisely what we find. Controlling for *proposal fixed-effects*, a mutual fund that belongs to significant dual holders are 0.7 percentage point *less* likely to vote in a pro-vega manner. This result also corroborates the causal interpretation of dual holders' impact: the proposal fixed-effects completely subsume the selection of firms and utilize only within-proposal heterogeneity across voters. Our findings suggest that dual holders wield their voting power to set the compensation structure of executives. As compared with pure equity holders, dual holders tend to vote to reduce vega in managerial contract to protect the value of their bond positions.

Our paper contributes to several strands of literature. First of all, it sheds new light on how conflict of interest between shareholders and bondholders shapes managerial compensation incentives. While the theory of shareholder-creditor conflicts has long been established (Jensen and Meckling (1976); Myers (1977); Smith and Warner (1979)), empirical evidence of how such conflict manifests in corporate poli-

cies is limited. Recently, a growing literature use institutions that are dual holders of a firm's equity and debt to study the impact of shareholder-creditor conflicts (Jiang et al. (2010); Bodnaruk and Rossi (2016); Chu (2018); Yang (2019)). Our paper is the first to link the degree of shareholder-bondholder conflict to managerial compensation structure. As managerial compensation encompasses many other corporate activities, the results in this paper provide a plausible channel for how dual holders affect corporate policies as documented in prior studies.

This paper also furthers our understanding of managerial compensations. While managerial compensation incentives mostly align the interest of managers with shareholders (e.g., Aggarwal and Samwick (1999); Guay (1999); Coles et al. (2006)), they have value implications for other stakeholders, such as creditors, as well. For example, DeFusco et al. (1990) documents that bond prices respond negatively to announcement of executive option plans. John and John (1993) provide a model under which shareholders use managerial compensation as a precommitment device to mitigate shareholder-creditor conflicts. Our evidence suggests that dual holders have different preferences over firm riskiness than pure equity holders, and would implement managerial contracts that are compatible with their risk preferences.

The findings in this paper also shed further light on how institutional investors shape the compensation structure of managerial contracts. Hartzell and Starks (2003) argue that institutional investors mitigate the agency problem of managers by increasing the pay-to-performance sensitivities of executive compensation. More recent studies show that institutional investors are heterogeneous in their abilities to monitor executives (e.g., Almazan, Hartzell, and Starks (2005); Chen, Harford, and Li (2007)). Our paper argues that financial institutions themselves may have divergent interests in how they set managerial incentives because of the level of their dual ownership in the firm.[4]

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[4]Antón, Ederer, Giné, and Schmalz (2018) argue that institutional investors' contracting incentives are also related to their common ownership in same-industry competitor firms.

Finally, our paper contributes to the mutual fund voting literature. Many studies have analyzed the voting patterns of mutual funds (Matvos and Ostrovsky (2010); Cai and Walkling (2011); Duan and Jiao (2016); Dimmock, Gerken, Ivković, and Weisbenner (2018); Brav, Jiang, and Li (2018)). The focus of these studies is how a mutual fund's shareholding in the company affects its voting decisions. In contrast, our analyses relate a mutual fund's dual holdings to its voting strategy. We show that dual holders tend to vote against vega-increasing compensation proposals in order to preserve the value of their debt positions. In a sense, our paper is closer to Matvos and Ostrovsky (2008) and Bodnaruk and Rossi (2016), which study cross ownership and dual ownership, respectively, on mutual funds' voting in mergers and acquisitions.

1 Hypotheses

The main premise of this paper is that dual holders, who have positions in both equity and bond of a firm, maximize the value of their combined holdings. In doing so, these institutions prefer a lower level of firm riskiness than pure equity holders do. To implement the desired level of corporate risk-taking, however, dual holders must align managerial incentives since many corporate policies are under the discretion of corporate managers. To the extent that managerial contracts with high sensitivities to stock price volatility (high "vega") effectively increase managerial risk-taking (Coles et al. (2006); Low (2009)), companies with a significant presence of dual holders are likely to write low-vega contracts with their managers.

However, one might argue that dual holders should *not* maximize the combined value of their holdings. Whereas a mutual fund family (or an investment company), such as Vanguard or Fidelity, have both equity and bond positions of a same firm, individual funds typically only hold either equity *or* bond positions. These individual funds have fiduciary duty to protect their investors' interest only. While academic

studies have documented cross-subsidization within fund families (e.g., Gaspar et al. (2005); Bhattacharya et al. (2013)), it is possible that equity funds with bond-holding siblings act to only maximize the value of equity. Therefore, the relation between dual ownership and managerial compensation incentives is an empirical issue.

Hypothesis 1. *Firms with significant dual holders have compensation policies that encourage less risk-taking.*

Moreover, the deviation of a dual holder's compensation preference relative to a pure equity holder should depend on the level of dual holder's equity holding and bond holding. Holding fixed her equity holding, a dual holder should have stronger incentives to reduce managerial risk-taking if she has a larger exposure to the bond value. Holding fixed a dual holder's bond holding, however, the relation between her equity holding and her desired managerial contract is ambiguous. Bondholders with larger equity positions may be more able to implement low-vega contracts, but they are also more aligned to pure equity holders.

Hypothesis 2. *The risk-taking incentives in a firm's managerial compensation are negatively related to dual holders' bond holding, and ambiguously related to dual holders' equity holding.*

If pure equity holders and dual holders have conflicts in the managerial compensation policies, their preferences should be reflected through their shareholder voting patterns. Specifically, if a managerial compensation proposal attempts to increase the CEO vega, dual holders are more likely to vote against it compared to pure equity holders. In contrast, if a managerial compensation proposal attempts to decrease the CEO vega, dual holders are more likely to vote for it.

Hypothesis 3. *Mutual funds whose parent financial conglomerates are significant dual holders of the firm are more likely to vote for proposals that discourage risk-taking and vote against proposals that encourage risk-taking.*

2 Data and sample construction

2.1 Data sources

We start constructing our sample by using managerial compensation information from the Execucomp database. The Execucomp covers the top five highest-paid executive for companies in the S&P 1500. For the purpose of our study, we focus on the compensation of CEOs. Our sample starts in 2006 and ends in 2016.[5]

We collect mutual fund equity holding data from Thomson Reuters Spectrum/CDA. The bond holdings of mutual funds come from Thomson Reuters eMAXX (formerly Lipper eMAXX). When we merge the managerial compensation of a firm with its bondholder information, we require a firm to have a positive amount of corporate bond outstanding at the point in time. Firm characteristics and industry classification are obtained from the Compustat. Past returns of a firm's stock is sourced from the CRSP. We exclude financial and utilities stocks. Our baseline sample includes 8,034 firm-years.

For our identification strategy, we make use of mergers between financial institutions that create dual holders. We extract M&A deals between financial firms from SDC in our sample period. For the analyses on mutual funds' voting behavior, we obtain the voting records of all mutual fund shareholders from ISS Voting Analytics.

2.2 Measuring dual ownership

We define dual holders of a firm as financial conglomerates that simultaneously hold stocks and bonds of the firm. Financial conglomerates are defined similarly as Bodnaruk and Rossi (2016), which are the ultimate parent firms of the financial institutions. The financial institutions that we mainly study in this paper are mutual

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[5]Hayes, Lemmon, and Qiu (2012) document that following the adoption of FAS 123R in 2005, companies significantly reduce their use of option-based compensation. To avoid confounding factors from the accounting rule change, we start our sample from 2006 (after the adoption of FAS 123R).

funds. We manually identify the financial conglomerate that each mutual fund family in Thomson Reuters Spectrum/CDA or Thomson Reuters eMAXX belongs to. The mutual funds from the same family share the same financial conglomerate. The manual identification process involves searching the firms information online through directory of investment advisers (www.adviserinfo.sec.gov), Morningstar's directory of mutual fund family (www.advisor.morningstar.com). Due to mergers and acquisitions between financial firms, a fund's parent conglomerate may change from time to time. We track such changes using M&A data from the SDC. A financial conglomerate typically have multiple funds that hold stocks of the same firm. In such cases, we aggregate them to obtain the conglomerate's stock holding of the firm for each quarter. Similarly, we aggregate a conglomerate's bond holding for a firm-quarter.

We start by identifying dual holders at investor level. Figure 1 shows an example. For a given firm (e.g., Verizon Communications, Inc), if a financial institution (e.g., T Rowe Price Associates) holds at least 0.5% of the firm's shares outstanding and at least 0.5% of the firm's bond outstanding through all its subsidiary funds, then the financial institution is defined as a *significant dual holder* of the company. We choose the threshold level to ensure that significant dual holders have both sufficient incentives to reduce firm risk and nontrivial voting power to change executive compensation.[6]

Next, at the firm level, we measure dual ownership of a firm in several ways: First, we define *num_dual* as the number of the firm's significant dual holders, as defined above. We also measure dual ownership by using the total equity ownership across all significant dual holders of the company (*dual_equity*) and the total bond ownership of significant dual holders (*dual_bond*). *dual_equity* is defined as the number of shares held by significant dual holders as a fraction of total shares outstanding. *dual_bond* is defined as the total par value of bond held by significant dual holders as a fraction of total par value of bond outstanding. For firms without significant dual holders, all

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[6]We employ alternative threshold levels such as 1% of equity and bonds. The results are qualitatively similar given there are enough observations of significant dual holders.

three measures are set to zero.

A caveat of our dual ownership measure is that we do not observe all the shareholders and creditors of a firm. Mutual funds are just a subset of investors in the equity and bond market. There are other institutions who hold stakes of the firm and might share the same parent financial conglomerate with the mutual funds in our sample. At the same time, we do not account for other forms of debt (for example, syndicated loans) that mutual funds may hold. In an ideal world, we would track the equity and debt holdings by any division of a financial conglomerate when determining its dual holding status, but we are bounded by the availability of data. In a sense, our dual ownership measures are underestimated relative to the true level of dual ownership. However, such shortcomings should bias us against finding the results.

2.3   Executive compensation

We examine the risk-taking incentives in managerial compensation by using both (i) the fraction of compensation derived by stock option grants and (ii) the sensitivity of CEO wealth to stock volatility (vega). Guay (1999) shows that stock options are much more sensitive to stock volatility than stock grants, hence the value of stock option granted to executives as a fraction of total compensation is a reasonable proxy for managers' risk-taking incentives. We take the fair value of option grant awarded in a given year (*option_award_fv* in Execucomp) scaled by total compensation in the same year (*tdc*1) as our option grant measure.

Vega is the change in dollar value of the executive's wealth for a one percentage point change in the annualized standard deviation of stock returns. The calculation of vega follows Guay (1999) and Core and Guay (2002) by using the Black-Scholes option model accounted for dividends. To compare the risk-taking incentives across firms with heterogeneous size, we standardize the dollar vega by the total value of

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compensation of a firm.

2.4 Summary statistics

In Table 1, we tabulate the summary statistics for executive compensation, dual ownership, and other characteristics for the firms in our main sample. On average 21.1% of CEO's annual compensation is awarded using option grants. There is also considerable variation across firms, as the standard deviation for option grants is 22.0%. In terms of vega, the average value is 3.1% of total compensation. This means when an average firm's annual stock volatility increases by one percentage point, the CEO's wealth would increase by 3.1% of her annual compensation. The average compensation delta for our sample firms is 12.4% of annual compensation. The summary statistics on executive compensation are consistent with past literature (e.g., Hayes et al. (2012)).

With regard to dual ownership, firms on average have 1.05 significant dual holders. If we further breaks down the sample, only 48% of the firm-years have at least one significant dual holders, and the 75th percentile of firm-year has 2 significant dual holders. Taking into account firms with no significant dual holders, a firm's significant dual holders on average hold 3.055% of firm equity and 6.151% of firm bond. If we instead conditional on firm-years with at least one significant dual holder, the average dual equity holding and bond holding are 6.3% and 12.7%, respectively.

3 Empirical findings

3.1 Baseline results

We test our first hypothesis that dual ownership is negatively related to the risk-taking incentives in a firm's managerial contract. Using the three measures of dual

ownership (*num_dual*, *dual_equity*, and *dual_bond*), we run the following regressions:

$$\frac{Option\ grants\ awarded_{i,t+1}}{Total\ compensation_{i,t+1}} = \alpha_t + \beta Dual_{i,t} + \theta Z_{i,t} + \epsilon_{i,t} \tag{1}$$

$$\frac{Vega_{i,t+1}}{Total\ compensation_{i,t+1}} = \alpha_t + \beta Dual_{i,t} + \theta Z_{i,t} + \epsilon_{i,t} \tag{2}$$

where $Z_{i,t}$ denotes a set of firm characteristics. Note that the right-hand-size variable is measure at the end of the previous fiscal year. Time fixed-effects are included since we are interested in cross-sectional variations. Our hypothesis predicts that β to be negative.

The first three columns of Table 2 display the results when the dependent variable is the option grant. On average, firms with more significant dual holders grant a smaller fraction of their total compensation in form of option grants, controlling for a host of firm characteristics. An increase of one significant dual holder reduces option grant awarded next year by 0.817 percentage point. This difference is statistically significant ($t = 2.95$) when the standard errors are clustered at firm level. This is consistent with Hypothesis 1 that firms with significant dual holders have compensation policies that encourage less risk-taking.

In Columns (2) and (3), we measure the dual ownership of a firm by using total equity and bond holdings of significant dual holders. In Column (2), a one standard deviation increase in *dual_equity* is associated with an decrease of option grant by 0.97 percentage point. In Column (3), a one standard deviation increase in *dual_bond* is associated with an decrease of option grant by 0.89 percentage point. The impact of dual equity holding and dual bond holding are both statistically significant and economically meaningful. These results suggest that the impact of dual holders on executive incentives is more pronounced when dual holders have more voting power of the company (higher *dual_equity*) and when dual holders' incentives are more aligned with bondholders (higher *dual_bond*). The effect of *dual_bond* has a clear

(negative) prediction because dual holders with a higher total bond holding are more align with creditors. The negative effect of *dual_equity* indicates that the impact of dual holders' increased voting power dominates the effect of their tighter alignment with shareholders.

In Columns (4) - (6), we use vega of CEO compensation, scaled by total compensation, as the dependent variable. An increase of one significant dual holder is associated with a decrease in CEO vega by 0.152 percentage point, with a t-statistics of 3.35 (Column (4)). This is also economically meaningful since the average CEO vega is 3.1% in our sample. In the final two columns, we use the equity holdings and bond holdings of significant dual holders to measure dual ownership, and in both cases a higher level of dual ownership is associated with a significantly lower compensation vega.

The relation between control variables and the risk-taking incentives in CEO compensation is largely consistent with prior literature (e.g., Guay (1999)). For example, book-to-market ratio is negatively related to risk-taking incentives, while R&D expenditure is positive related. This is consistent with the argument that firms with better investment opportunity set tend to use more convex contracts. We further control for total institutional equity ownership and bond ownership, two variables that are mechanically positively related to the dual ownership measure. Total equity ownership is shown to positively correlate with option grants, while institutional bond ownership seems to be uncorrelated with managerial compensation.

Furthermore, the conflict between shareholders and creditor are more acute when a firm is closer to financial distress (Smith and Warner (1979), Gilson and Vetsuypens (1993)). Therefore, it is potentially more important for dual holders in distressed firms to align the interest of managers by reducing the risk-taking incentives in managerial contracts. We conjecture that the negative relation between dual ownership and CEO vega is more pronounced for firms that are more likely in financial distress.

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To test this conjecture, in each year, we sort firms into high-leverage group ("High") and low-leverage group ("Low") by comparing their book leverage ratio with the cross-sectional median. For each subsample, we separately run the baseline regression in Equation 2 in which CEO vega is the dependent variable. The results are presented in Table 3. Consistent with our conjecture, the relation between managerial risk-taking incentives and dual ownership is negative and significant for firms in the high-leverage group. For example, an increase of one significant dual holder reduces CEO vega by 0.25 percentage point ($t = 3.80$). As a comparison, this relation is insignificant for low-leverage firms.

The results in this section confirms our main hypothesis that dual ownership is negatively associated with the risk-taking incentives in executive compensation. It suggests that dual holders have divergent preference from pure equity holders with regard to how much risks managers should be induced to take. The fact that the impact of dual holders on managerial risk-taking incentive is concentrated among high-leverage firms indicates that shareholder-creditor conflict drives the observed relation.

3.2 Dual ownership and compensation Delta

In contrast to the relation between dual ownership and the risk-taking incentives in managerial compensation, there is no prediction on how dual ownership should affect the average pay-to-performance sensitivity (i.e., delta). Holding the vega of the compensation constant, a contract with a high sensitivity to stock returns does not necessarily undermine bondholders' value. Therefore, we empirically examine the impact of dual ownership on amount of stock grants as a fraction of total compensation and on the compensation delta (as in Core and Guay (2002)).

We estimate the following equations:

$$\frac{Stock\ grants\ awarded_{i,t+1}}{Total\ compensation_{i,t+1}} = \alpha_t + \beta Dual_{i,t} + \theta Z_{i,t} + \epsilon_{i,t} \tag{3}$$

$$\frac{Delta_{i,t+1}}{Total\ compensation_{i,t+1}} = \alpha_t + \beta Dual_{i,t} + \theta Z_{i,t} + \epsilon_{i,t} \tag{4}$$

where $Dual_{i,t}$ represents one of the three measures of dual ownership (num_dual, $dual\_equity$, and $dual\_bond$).

Table 4 presents the results. As expected, dual ownership is not significantly related to the amount of stock grants awarded to the CEO. None of the three dual ownership measures predicts stock grants. Similarly, the delta of CEO compensation is also unrelated to the level of a firm's dual ownership.

Combined the findings in Table 4 with results in the previous section, we document that firms with a higher level of dual ownership reduce the CEO vega, but leave the delta of compensation unchanged. It suggests that the conflict between shareholders and creditors are more important for the risk-taking incentives in their managerial compensation than for the pay-for-performance sensitivity.

3.3 Identification strategy

The baseline results suggest an inverse relation between dual ownership and the risk-taking incentives embedded in executive compensations. However, the interpretation is subject to endogeneity concerns: Suppose a firm's managerial compensation is already in place, its shareholders and bondholders may select to dual-invest based on the risk-taking incentives in the compensation. For existing bondholders, an argument can be made that they are more likely to cross-invest in a firm's stock if they believe that risk-taking incentives of the managerial compensation is high. This is opposite of what we find in the baseline tests. For existing shareholders, they may invest in a firm's bond if the firm's managerial compensation encourages less risk-taking. This

selection issue may confound our results.

To address the endogeneity concern, we take advantages of mergers between financial institutions that increase dual ownership of their portfolio companies. Suppose that Financial Company A holds a significant share of *Innocent Inc.*'s stock but not its bond, while Financial Company B holds a significant share of *Innocent Inc.*'s bond but not its stock. When A and B merge to form a new financial institution AB, the new entity becomes a significant dual holder of *Innocent Inc.* The reason for the merger between financial institutions are plausibly exogenous to the shareholder-bondholder conflicts of their portfolio companies. Therefore, such a setting provides us a relatively clean shock to identify the causal effect of dual ownership on managerial compensation.

In order to identify mergers and acquisitions that create dual holders, we start by extracting M&A deals between financial firms from SDC from 2003 to 2012. We then select M&As where one party is a mutual fund family in the Thomson Reuters equity holdings dataset and the other party is a financial institution in the eMAXX bond holdings dataset. To ensure that our selected mergers materially shock the dual ownership of a firm, we require that, before the merger, the shareholder holds at least 0.5% of shares outstanding but no bond, and the bondholder holds at least 0.5% of bond outstanding but no equity. Hence, after the shareholder and the bond holder merge, they automatically become a significant dual holder.

We find 20 such M&A deals from 2004 to 2011 that create dual holders for 283 affected firms. Excluding firms in financial and utility industry and merging with Execucomp data, we end up with 150 treated firms. Table 5 tabulate the number of M&A deals and treated firms across our sample period. The merger deals are relatively evenly distributed across years, while the number of treated firms fluctuate based on the size of involved financial institutions. On average, each M&A affects 7.5 treated firms.

Next, we follow the procedure of Hong and Kacperczyk (2010) and Chu (2018) to match the control firms with the treatment firms. Specifically, we first rank all the firms into quintiles based on size, book-to-market ratio, and past performance. We require the control firms to be in the same quintiles as treatment firms. We then rank from the smallest to the largest the differences between the control firms and treatment firms in terms of size, book-to-market ratio, and past performance. We sort all candidate firms based on the total rank, and keep the two control firms with the smallest total rank.

We run the following regression on the sample of treatment and control firms:

$$\frac{Option\ grant_{i,t+1}}{TotalComp_{i,t+1}} = \alpha + \beta_1 treat_i * post_{i,t} + \beta_2 treat_i + \beta_3 post_{i,t} + \theta Z_{i,t} + \epsilon_{i,t} \quad (5)$$

$$\frac{Vega_{i,t+1}}{TotalComp_{i,t+1}} = \alpha + \beta_1 treat_i * post_{i,t} + \beta_2 treat_i + \beta_3 post_{i,t} + \theta Z_{i,t} + \epsilon_{i,t} \quad (6)$$

where $treat_i$ is a dummy that equals one for treatment firm and zero otherwise; $post_{i,t}$ is a dummy that equals one for treatment firms after the M&A takes place, and zero otherwise. For control firms, $post_{i,t}$ if also set to one after the treatment firm it matches with experiences the M&A. $Z_{i,t}$ is a set of firm characteristics.

If the effect of dual ownership on managerial compensation is causal, one should expect the treated firms, which have exogenously increased level of dual ownership, shift to a managerial compensation structure that encourages less risk-taking. If other words, the newly-formed dual holders in the treatment firms should attempt to adopt executive contracts with a smaller component in option grants and a lower vega. Therefore, we expect that β_1 in the above specification to be negative.

This is what we find in Table 6. Column (1) shows that, compared to control firms, firms that gain significant dual holders after the M&As of their holding companies reduce their use of option grants by 6.3 percentage points afterwards. After we absorb firm level heterogeneity by using firm FE, the relative reduction in option use

is estimated at 9.4 percentage points, and statistically significant ($t = 2.42$).

In Columns (3) and (4) Table 6, we further examine the CEO vega in the diff-in-diff setting. Compared to control firms, treatment firms' vega drops by 0.749 percentage point after the M&A events ($t = 2.02$). This difference widens to 1.122 percentage points ($t = 3.04$) after controlling for firm FE (Column (4)). Moreover, neither the coefficient on *post* and *treat* is statistically different from zero, suggesting the relative decline is driven by neither systematic differences between treatment and control firm nor general time trend.

The results from this section indicates that firms that experience an exogenous increase in the dual ownership subsequently reduce the risk-taking incentive in their executive compensation. This suggests that relation between dual ownership and vega is likely causal.

3.4   Voting patterns of dual holders

We have shown that dual ownership induces firms to adopt managerial contracts with a low vega. To put such incentive structure in place, dual holders have to exert their right as shareholders and voting on managerial compensation proposals. In this section, we examine the voting pattern of mutual funds on such proposals, and how dual holders and pure equity holders vote differently.

Equity-based compensation requires shareholder approval (Morgan and Poulsen (2001); Martin and Thomas (2005); Cai and Walkling (2011)). Most exceptions to such approval are eliminated after a 2002 SEC reform (Yermack (2010)). Voting represents a very direct mechanism through which shareholders (including dual holders) affect the structure of executive compensation. To be clear, we do not argue that voting is the *only* mechanism: investors can use private communication to persuade or pressure the board compensation committee in setting the managerial contracts. However, to make their pressure credible, investors must vote in a way that conveys

their preference.

The voting records of mutual funds come from ISS Voting Analytics. For every proposal of the Russell 3000 Index companies from 2003 to 2012, ISS maintains records of the firm name, ticker and CUISIP of the firm, meeting date, proposal sponsor, proposal content, ISS classified proposal type, ISS recommendation and management recommendation for the vote, and voting results (pass, fail, withdrawn, pending) of each proposal at each meeting. The actual vote is cast at individual fund level, as ISS provides information on the identity of mutual funds and their vote toward a given proposal. We match the mutual funds in the ISS data to the financial institutions they belong to in the Thomson Reuters and eMAXX datasets. Our focus is on management compensation proposals, which are coded by ISS as "M0522", "M0524", and "M0535". There are 3,353 such proposals in the database.

It is difficult to determine whether a proposal would increase or decrease the risk-taking incentives ex ante from the proposal content, as the proposals offer a comprehensive compensation package. Therefore, we have to take an indirect approach by only examining *approved* proposals: for every proposal that is approved, we compare the CEO vega (relative to total compensation) one year before the vote and one year after the vote. If the CEO vega increases after the vote, we classify the vote as vega-increasing; If the CEO vega decreases after the vote, we classify the vote as vega-decreasing. We do not utilize proposals that are rejected.

We code a mutual fund's voting action not by whether it votes for or against a given proposal, but by whether it votes to increase or decrease CEO vega. More specifically, if a mutual fund votes for a vega-increasing proposal or votes against a vega-decreasing proposal, it is defined as a "pro-vega" vote. In such a case, a binary outcome variable *pro_vega* is set to one. In our sample, 46.5% of the votes are pro-vega. Since some compensation proposals are vega-increasing and some are vega-decreasing, a fund's decision to cast a "pro-vega" or "anti-vega" vote is not con-

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founded by the fund's general tendency to vote for or against compensation proposals.

The voting setup allows us to explore the within-proposal variation across a firm's shareholders. To do so, we control for proposal fixed-effects throughout our specifications. Such fixed-effects should completely absorb heterogeneity across firm-time, alleviating selection concerns. A mutual fund is classified as a firm's dual holder if the mutual fund belongs to a financial conglomerate that is a significant dual holder of the firm (at least 0.5% of equity and 0.5% of bond). If our hypothesis stands that dual holders are more inclined to have a low-vega managerial compensation, we should expect that dual holder funds to vote in a less pro-vega way as compared to pure equity holders.

We run the following regression at for fund i and proposal j:

$$pro\_vega_{i,j} = \alpha_j + \beta_1 * dual_{i,j} + \theta * Z_{i,t} + \epsilon_{i,t} \tag{7}$$

Table 7 shows how dual ownership affects the voting pattern of mutual funds. In Column (1), we find that mutual funds that belong to a significant dual holder are 0.6 percentage point less likely to vote in a pro-vega way, as compared to pure equity holder. The difference is voting pattern is statistically significant at 1% level ($t = 3.07$). Although the economic magnitude of belonging to a significant dual holder seems small, it is obtained after control for all across-proposal variations, and the point estimate should serve as a lower bound of the true effect. In Columns (2) and (3), and the equity ownership and the bond ownership of a mutual fund's parent company, conditional on being a significant dual holder, are negatively related to the probability that the mutual fund votes in a pro-vega manner.

Columns (4) - (6) of Table 7 add fund fixed-effects to control for unobservable heterogeneity across mutual funds' voting behavior. Since most mutual funds vote as shareholders in multiple companies, we can exploit that fact that they might be

a dual holder in one company and a pure equity holder in another. We find that, for example in Column (4), mutual funds belonging to significant dual holders are 0.7 percentage point less likely to vote to increase vega ($t = 3.32$). Moreover, both the equity ownership and the bond ownership of a mutual fund's parent company are significantly negatively associated with the pro-vega voting probability

Overall, the findings in this section suggest that dual ownership significant affects mutual funds' voting pattern with respect to managerial compensation proposals. A dual holder is more likely to vote against vega-increasing proposals and vote for vega-decreasing proposals. This is consistent with our conjecture that dual holders maximize their total holdings value. It also establishes shareholder voting as an important channel through which dual holders implement low-vega executive compensations.

4 Conclusions

This paper examines how shareholder-creditor conflict affects the risk-taking incentives in executive compensation. In particular, we examine the impact of the presence of dual holders, institutions that hold more equity and bond of a company, on the compensation structure. We find that various measures of dual ownership is negatively related to both option grants as a fraction of total compensation and the vega (the sensitivity of CEO wealth to stock price volatility) of compensation. The findings suggest that a mitigation of shareholder-creditor conflict leads firms to adopt less convex executive contracts.

We take advantages of mergers between financial institutions that create significant dual holders of their portfolio companies as our identification strategy. Firms that experience such exogenous increase in their dual ownership subsequent reduce option grants and compensation vega relative to matched control firms. We further pin down voting on compensation proposals as a main channel through which dual

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holders influence managerial compensation structure. Compared with pure equity holders, dual holders are more likely to strike down proposals that increase CEO vega and vote for vega-decreasing proposals.

A growing literature document that firm with dual holders choose a set of less risky corporate policies (Jiang et al. (2010); Bodnaruk and Rossi (2016); Chu (2018); Yang (2019)). Our findings shed light on an important mechanism under which dual holders implement such policies.

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Figure 1. Example of a significant dual holder

T Rowe Price Associates, Inc.

T Rowe Price U.S. Large Core Fund

T Rowe Price Capital Opp Fund

....

T Rowe Price Corporate Income Fund

T Rowe Price Spectrum Income Fund

1.12% of Verizon's equity

1.86% of Verizon's bond
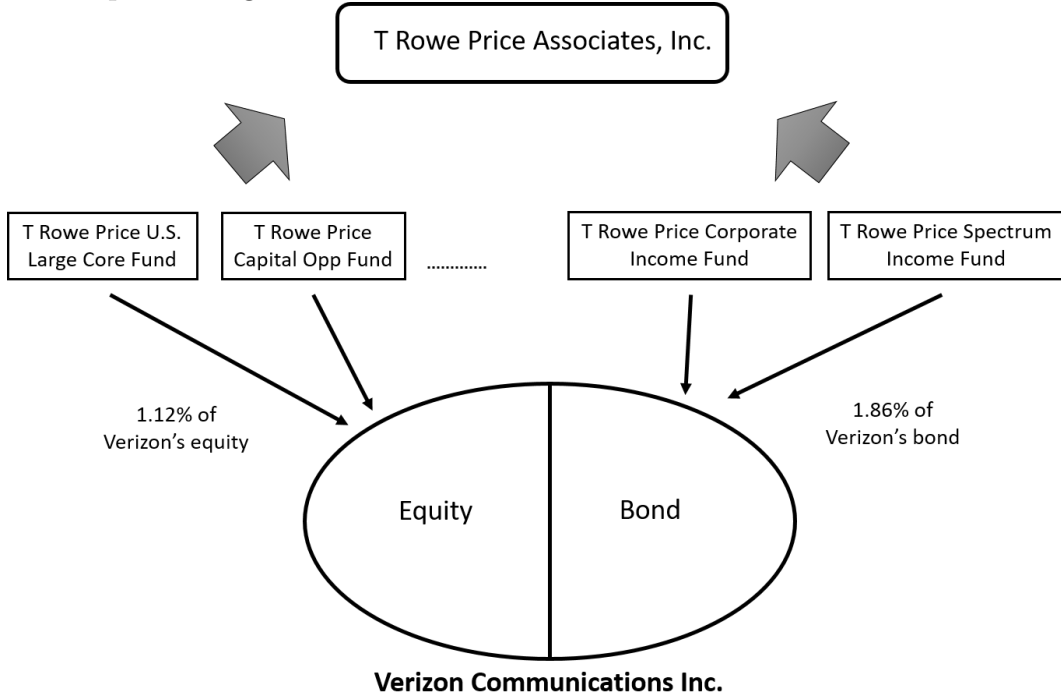
Equity

Bond

Verizon Communications Inc.

Table 1. Summary statistics

This table shows the summary statistics of firm-level variables. CEO vega and delta is calculated as in Core and Guay (2002). Option award value and total compensation are obtained from *option_award_fv* and *tdc*1 from the Execucomp, respectively. Significant dual holders are institutional investors which hold at least 0.5% of the firms total outstanding equity and at least 0.5% of the firms total outstanding bonds. Dual equity holding is the total equity holdings held by significant dual holders as a percentage of total shares outstanding. Dual bond holding is the total bond holdings held by significant dual holders as a percentage of total bond outstanding. Book leverage is defined as the sum of long term debt and short term debt divided by total assets. Return on asset is operating income before depreciation divided by total assets. Stock past performance is the compounded stock return in previous 12 months adjusted by market return. Stock volatility is the standard deviation of the stock monthly return over the past 3 years. Variables are winsorized at 1%.

	Mean	Std	Min	Max	p25	p50	p75	N
Option award value/Total compensation (%)	21.076	21.961	0.000	82.057	0.000	17.290	34.376	8,034
CEO vega/Total compensation (%)	3.109	4.253	0.000	25.034	0.461	1.699	4.014	8,034
CEO delta/Total compensation (%)	12.411	28.986	0.081	229.735	2.443	5.030	10.225	8,034
# of significant dual holders	1.050	1.390	0.000	10.000	0.000	0.000	2.000	8,034
Dual equity holding (%)	3.055	4.388	0.000	17.266	0.000	0.000	5.485	8,034
Dual bond holding (%)	6.151	10.460	0.000	60.000	0.000	0.000	8.794	8,034
Log(Total assets)	22.163	1.376	19.384	25.895	21.140	22.028	23.047	8,034
Book-to-market ratio	0.570	0.423	0.032	2.573	0.292	0.464	0.724	8,034
Book leverage	0.285	0.148	0.000	0.869	0.181	0.267	0.372	8,034
Return on asset	0.099	0.063	-0.107	0.295	0.063	0.097	0.133	8,034
R&D/Total assets	0.023	0.041	0.000	0.215	0.000	0.003	0.027	8,034
Sales/Total assets	1.004	0.662	0.161	3.609	0.557	0.847	1.242	8,034
PPE/Total assets	0.283	0.235	0.010	0.897	0.105	0.204	0.406	8,034
Stock past performance	0.037	0.345	-0.739	1.438	-0.171	0.004	0.191	8,034
Stock volatility	0.104	0.053	0.037	0.323	0.068	0.090	0.125	8,034
Total institutional ownership (%)	79.537	18.959	0.966	100.000	71.612	83.231	92.641	8,034
Total institutional bond ownership (%)	60.163	32.457	0.058	100.000	34.050	56.041	100.000	8,034
Conditional on having at least one significant dual holder								
# of significant dual holders	2.172	1.248	1.000	10.000	1.000	2.000	3.000	3,887
Dual equity holding (%)	6.323	4.380	0.501	17.266	2.681	5.689	8.895	3,887
Dual bond holding (%)	12.735	11.950	0.292	60.000	4.795	9.119	16.183	3,887

Table 2. Dual ownership and risk-taking incentives in managerial compensation

This table shows the relation between dual ownership and the risk-taking incentives in managerial compensation. In Columns (1) - (3), the dependent variable is the fair value of option awarded in year t divided by total compensation of that year. In Columns (4) - (6), the dependent variable is the vega (Core and Guay (2002)) divided by total compensation. Significant dual holders are institutional investors which hold at least 0.5% of the firms total outstanding equity and at least 0.5% of the firms total outstanding bonds. Dual equity/bond holding is the total equity/bond holdings held by significant dual holders as a percentage of total equity/bond outstanding. Industry fixed effect is by 2-digit-SIC. Standard errors are clustered at firm level. ***, **, and * represent result significant at 1%, 5%, and 10% level, respectively.

Dependent variable	Option grant/Total compensation			Vega/Total compensation		
	(1)	(2)	(3)	(4)	(5)	(6)
# of significant dual holders	-0.817***			-0.152***		
	(-2.95)			(-3.35)		
Dual equity holding		-0.221**			-0.039***	
		(-2.41)			(-2.69)	
Dual bond holding			-0.083***			-0.020***
			(-2.59)			(-4.25)
Log(Total assets)	2.114***	2.062***	1.898***	0.514***	0.502***	0.478***
	(5.11)	(5.02)	(4.71)	(7.46)	(7.38)	(7.22)
Book-to-market ratio	-6.911***	-6.900***	-6.855***	-0.952***	-0.949***	-0.944***
	(-6.77)	(-6.73)	(-6.70)	(-5.16)	(-5.12)	(-5.16)
Book leverage	-6.900**	-7.131**	-7.421**	-0.429	-0.478	-0.511
	(-2.08)	(-2.15)	(-2.24)	(-0.78)	(-0.87)	(-0.93)
Return on assets	5.833	6.070	6.336	-1.659	-1.611	-1.571
	(0.96)	(1.00)	(1.04)	(-1.57)	(-1.52)	(-1.50)
R&D/Total assets	57.300***	57.186***	57.470***	8.412***	8.386***	8.484***
	(3.55)	(3.56)	(3.56)	(3.41)	(3.41)	(3.45)
Sales/Total assets	-3.505***	-3.495***	-3.551***	-0.517***	-0.515***	-0.526***
	(-3.80)	(-3.78)	(-3.86)	(-3.57)	(-3.55)	(-3.64)
PPE/Total assets	-8.332***	-8.370***	-8.363***	-1.065**	-1.073**	-1.067**
	(-2.62)	(-2.62)	(-2.62)	(-2.02)	(-2.03)	(-2.02)
Stock past performance	-5.476***	-5.465***	-5.459***	-1.559***	-1.557***	-1.554***
	(-7.21)	(-7.20)	(-7.19)	(-11.25)	(-11.25)	(-11.27)
Stock volatility	26.848***	27.372***	28.014***	-5.567***	-5.475***	-5.292***
	(2.84)	(2.89)	(2.96)	(-3.66)	(-3.60)	(-3.50)
Total institutional equity ownership	0.059***	0.057***	0.055***	0.001	0.001	0.001
	(2.94)	(2.81)	(2.76)	(0.33)	(0.18)	(0.24)
Total institutional bond ownership	0.021	0.021	0.016	0.001	0.001	-0.001
	(1.46)	(1.47)	(1.14)	(0.29)	(0.32)	(-0.26)
Industry FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
N	8,034	8,034	8,034	8,034	8,034	8,034

Table 3. Dual ownership and risk-taking incentives in managerial compensation: cross-sectional variations

This table shows how the relation between dual ownership and the compensation vega varies with book leverage of a firm. The dependent variable is the vega (Core and Guay (2002)) divided by total compensation. Each year, firms are sorted into two group (Low and High) based on their book leverage. Significant dual holders are institutional investors which hold at least 0.5% of the firms total outstanding equity and at least 0.5% of the firms total outstanding bonds. Dual equity/bond holding is the total equity/bond holdings held by significant dual holders as a percentage of total equity/bond outstanding. Industry fixed effect is by 2-digit-SIC. Standard errors are clustered at firm level. ***, **, and * represent result significant at 1%, 5%, and 10% level, respectively.

Dependent variable: Vega/Total compensation						
Leverage	Low	High	Low	High	Low	High
	(1)	(2)	(3)	(4)	(5)	(6)
# of significant dual holders	-0.065	-0.250***				
	(-1.04)	(-3.80)				
Dual equity holding			-0.007	-0.067***		
			(-0.37)	(-3.28)		
Dual bond holding					-0.015	-0.025***
					(-1.48)	(-3.53)
Log(Total assets)	0.506***	0.466***	0.491***	0.452***	0.499***	0.399***
	(4.73)	(5.43)	(4.61)	(5.41)	(4.77)	(4.95)
Book-to-market ratio	-0.754***	-1.273***	-0.748***	-1.267***	-0.754***	-1.252***
	(-3.46)	(-3.84)	(-3.41)	(-3.81)	(-3.48)	(-3.78)
Book leverage	-1.566*	-0.398	-1.579*	-0.543	-1.587*	-0.714
	(-1.71)	(-0.29)	(-1.72)	(-0.40)	(-1.74)	(-0.52)
Return on assets	0.643	-4.578***	0.704	-4.561***	0.656	-4.444***
	(0.48)	(-2.87)	(0.52)	(-2.86)	(0.49)	(-2.80)
R&D/Total assets	7.917**	8.813***	7.874**	8.889***	8.033**	8.779***
	(2.20)	(2.91)	(2.18)	(2.96)	(2.24)	(2.88)
Sales/Total assets	-0.654***	-0.471***	-0.658***	-0.463**	-0.655***	-0.500***
	(-2.80)	(-2.61)	(-2.82)	(-2.57)	(-2.81)	(-2.79)
PPE/Total assets	-1.157	-0.588	-1.166	-0.591	-1.135	-0.585
	(-1.61)	(-0.83)	(-1.63)	(-0.84)	(-1.59)	(-0.83)
Stock past performance	-1.303***	-1.878***	-1.301***	-1.871***	-1.310***	-1.853***
	(-6.68)	(-9.42)	(-6.67)	(-9.41)	(-6.74)	(-9.31)
Stock volatility	-4.121**	-6.251**	-4.060**	-6.314***	-3.903**	-6.041**
	(-2.18)	(-2.55)	(-2.14)	(-2.59)	(-2.07)	(-2.47)
Total institutional equity ownership	0.006	-0.008	0.005	-0.008	0.006	-0.009
	(1.48)	(-1.40)	(1.30)	(-1.52)	(1.64)	(-1.61)
Total institutional bond ownership	0.004	-0.001	0.004	-0.001	0.003	-0.002
	(1.29)	(-0.39)	(1.32)	(-0.33)	(0.97)	(-0.82)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	4,011	4,010	4,011	4,010	4,011	4,010

Table 4. Dual ownership and pay-performance sensitivity

This table shows the relation between dual ownership and the pay-performance sensitivity in managerial compensation (delta). In Columns (1) - (3), the dependent variable is the fair value of stock grants awarded in year t divided by total compensation of that year. In Columns (4) - (6), the dependent variable is the delta (Core and Guay (2002)) divided by total compensation. Significant dual holders are institutional investors which hold at least 0.5% of the firms total outstanding equity and at least 0.5% of the firms total outstanding bonds. Dual equity/bond holding is the total equity/bond holdings held by significant dual holders as a percentage of total equity/bond outstanding. Industry fixed effect is by 2-digit-SIC. Standard errors are clustered at firm level. ***, **, and * represent result significant at 1%, 5%, and 10% level, respectively.

Dependent variable	Stock grants/TDC1			Delta/TDC1		
	(1)	(2)	(3)	(4)	(5)	(6)
# of significant dual holders	0.169			0.042		
	(0.49)			(0.18)		
Dual equity holding		0.028			-0.065	
		(0.25)			(-0.79)	
Dual bond holding			-0.020			-0.001
			(-0.49)			(-0.07)
Log(Total assets)	2.809***	2.845***	2.901***	0.312	0.417	0.331
	(5.14)	(5.20)	(5.54)	(0.64)	(0.85)	(0.73)
Book-to-market ratio	0.105	0.099	0.080	-3.153***	-3.175***	-3.158***
	(0.07)	(0.07)	(0.06)	(-3.02)	(-3.04)	(-3.04)
Book leverage	7.552*	7.670*	7.853*	-8.116***	-7.851**	-8.056***
	(1.74)	(1.77)	(1.82)	(-2.61)	(-2.53)	(-2.60)
Return on assets	-36.473***	-36.563***	-36.637***	9.402	9.286	9.368
	(-4.44)	(-4.44)	(-4.45)	(1.36)	(1.35)	(1.36)
R&D/Total assets	52.668***	52.758***	53.094***	11.266	11.502	11.327
	(2.67)	(2.68)	(2.69)	(0.94)	(0.96)	(0.94)
Sales/Total assets	1.106	1.106	1.105	-2.936***	-2.918***	-2.935***
	(0.92)	(0.92)	(0.92)	(-2.97)	(-2.95)	(-2.97)
PPE/Total assets	13.029***	13.048***	13.084***	1.071	1.101	1.080
	(2.90)	(2.90)	(2.91)	(0.38)	(0.39)	(0.38)
Stock past performance	-6.349***	-6.345***	-6.327***	0.386	0.402	0.390
	(-6.56)	(-6.56)	(-6.54)	(0.58)	(0.61)	(0.59)
Stock volatility	-8.383	-8.515	-8.142	-2.151	-2.063	-2.148
	(-0.66)	(-0.67)	(-0.64)	(-0.31)	(-0.29)	(-0.31)
Total institutional equity ownership	0.043	0.045	0.048*	-0.063***	-0.059***	-0.062***
	(1.53)	(1.59)	(1.75)	(-3.33)	(-3.09)	(-3.34)
Total institutional bond ownership	-0.006	-0.006	-0.008	0.008	0.007	0.008
	(-0.33)	(-0.34)	(-0.44)	(0.71)	(0.65)	(0.69)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	6,033	6,033	6,033	6,033	6,033	6,033

Table 5. Distribution of M&A events and treamentt firms

This table shows the total numbers of M&As and treatment firms in the final sample used for the difference-in-differences study. The M&A events are mergers and acquisitions between financial institutions that change a financial institution from pure equity holder or bond holder to a significant dual holder of a firm. The affected firms are our treatment firms. Significant dual holder is defined as that the institutional investor holds at least 0.5% of the firms total outstanding equity and at least 0.5% of the firms total outstanding bonds.

Year	No. of M&A events	No. of treatment firms
2004	4	34
2005	1	1
2006	2	10
2007	2	16
2008	2	3
2009	3	36
2010	4	47
2011	2	3
Total	20	150

Table 6. Difference-in-differences regressions with financial conglomerate mergers

This table shows the results from difference-in-differences regressions around the mergers of financial conglomerates. *treat* is a dummy for firms that gain significant dual holder(s) following the mergers of their shareholders and bondholders. Control firms are matched with treatment firms on size, book-to-market, and past stock returns. *post* is a dummy that equals one for treatment firms after the M&A takes place, and zero otherwise. For control firms, $post_{i,t}$ if also set to one after the treatment firm it matches with experiences the M&A. Industry fixed effect is by 2-digit-SIC. Standard errors are clustered at firm level. ***, **, and * represent result significant at 1%, 5%, and 10% level, respectively.

Dependent variable	Option grant/Total compensation		Vega/Total compensation	
	(1)	(2)	(3)	(4)
Treat x Post	-6.259*	-9.366**	-0.749**	-1.122***
	(-1.71)	(-2.42)	(-2.02)	(-3.04)
Treat	3.101		0.596	
	(0.98)		(1.62)	
Post	0.003	2.461	0.339	0.257
	(0.00)	(0.86)	(1.26)	(1.09)
Log(Total assets)	2.743**	2.164	0.553***	0.819**
	(2.05)	(0.55)	(3.49)	(2.24)
Book-to-market ratio	-8.573***	-5.760*	-0.982***	-1.063***
	(-3.53)	(-1.95)	(-3.67)	(-4.36)
Book leverage	-13.723*	-9.428	-2.211**	-0.790
	(-1.66)	(-0.75)	(-2.53)	(-0.77)
Return on asset	-53.009***	-64.368***	-4.200**	-8.731***
	(-3.42)	(-3.32)	(-2.12)	(-5.31)
Sales/Total assets	-8.357***	-6.691	-0.316	-0.241
	(-3.22)	(-1.35)	(-1.21)	(-0.59)
R&D/Total assets	53.135	-7.648	-0.483	0.879
	(1.21)	(-0.06)	(-0.07)	(0.09)
PPE/Total assets	-19.773**	-5.811	-2.154**	0.195
	(-2.05)	(-0.34)	(-2.23)	(0.14)
Stock past performance	-10.926***	-8.041***	-1.431***	-0.976***
	(-5.23)	(-3.97)	(-7.84)	(-6.98)
Stock volatility	59.820**	84.572**	-6.351***	-2.588
	(2.22)	(2.54)	(-2.78)	(-1.17)
Total institutional equity ownership	-3.066	-10.149*	-1.587**	-0.879*
	(-0.62)	(-1.87)	(-2.44)	(-1.81)
Total institutional bond ownership	5.464*	5.817*	-0.014	0.164
	(1.73)	(1.95)	(-0.06)	(0.54)
Industry FE	Yes	No	Yes	No
Firm FE	No	Yes	No	Yes
Year FE	Yes	Yes	Yes	Yes
N	2,924	2,924	2,924	2,924

Table 7. Mutual funds voting on compensation proposals

This table shows the pattern of mutual fund voting with regard to managerial compensation proposals. The dependent variable is binary variable *pro_vega* indicating that a mutual fund votes for a vega-increasing proposal or vote against a vega-decreasing proposal. A proposal is vega-increasing if it is approved and the CEO vega increases in the subsequent year. A proposal is vega-decreasing if it is approved and the CEO vega decreases in the subsequent year. Significant dual holder is a dummy indicating that a mutual fund belongs to a financial conglomerate that is a significant dual holder of the company. Dual equity ownership is the equity holding of the parent financial conglomerate as a fraction of shares outstanding, conditional on the parent institution being a significant dual holder. Dual bond ownership is the bond holding of the parent financial conglomerate as a fraction of bond outstanding, conditional on the parent institution being a significant dual holder. Standard errors are clustered at mutual fund level. ***, **, and * represent result significant at 1%, 5%, and 10% level, respectively.

Dependent variable: $Dummy(pro\_vega)$						
	(1)	(2)	(3)	(4)	(5)	(6)
Significat dual holder	-0.006***			-0.007***		
	(-3.07)			(-3.32)		
Dual equity ownership		-0.102			-0.202***	
		(-1.48)			(-2.89)	
Dual bond ownership			-0.046*			-0.075**
			(-1.67)			(-2.56)
Log(fund TNA)	-0.000	-0.000	-0.000	-0.002	-0.002	-0.002
	(-0.30)	(-0.28)	(-0.36)	(-1.08)	(-1.09)	(-1.08)
Fund turnover rate	0.001	0.001	0.001	-0.005	-0.005	-0.005
	(0.83)	(0.83)	(0.82)	(-1.53)	(-1.52)	(-1.53)
Fund expense ratio	0.109	0.104	0.114	-2.115*	-2.119*	-2.114*
	(0.50)	(0.47)	(0.52)	(-1.90)	(-1.90)	(-1.90)
Fund alpha	0.347	0.332	0.345	0.245	0.241	0.245
	(0.75)	(0.72)	(0.75)	(0.45)	(0.45)	(0.45)
Fund FE	No	No	No	Yes	Yes	Yes
Proposal FE	Yes	Yes	Yes	Yes	Yes	Yes
N	265,111	265,111	265,111	265,111	265,111	265,111