Why is Executive Compensation Deferred? Evidence from a Natural Experiment

by

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Abstract

Using a recent regulatory change of CFO coverage under IRC Section 162(m) as a natural experiment, I provide *causal* evidence that firms use deferred compensation to preserve the tax deductibility of executive non-performance-based compensation. This finding contradicts the conventional wisdom that firms use deferred compensation to mitigate the agency cost of debt or to reallocate compensation expense from a low-tax year to a high-tax year. I also find that executives defer compensation before retirement to save state income tax. In addition, cash compensation is deferred when the firm faces liquidity constraints. My results suggest that tax reform limiting the deductibility of executive equity compensation may have an unintended consequence of creating incentives for firms to use deferred compensation to preserve the tax deductibility of equity compensation.

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1 Introduction

Eastman Kodak, a photography pioneer based in Rochester, NY, filed for Chapter 11 bankruptcy protection on January 19, 2012. Kodak's plan of reorganization, approved by the United States Bankruptcy Court for the Southern District of New York on August 20, 2013, stipulates that the $15 million balance in Kodak's non-qualified deferred compensation is treated the same as the other $2.8 billion unsecured debt, and executives participating in the deferred compensation plan will receive only 4% to 5% of their balances. Although this court judgment is not surprising because non-qualified deferred compensation is unfunded, unsecured, and has the same priority as claims of other creditors when the firm defaults, it seems puzzling that Kodak's executives, especially its CEO, keep deferring compensation after observing many obvious "red flags", e.g. repeatedly missing quarterly earnings targets and reporting a net loss for 7 out of the 8 consecutive years since 2005, before Kodak filed for bankruptcy.

The deferred compensation holdings of Kodak executives are not exceptional. Roughly a third of the CEOs of the S&P 1500 firms have more than $3 million in deferred compensation accounts. In extreme cases, such as the CEO of Honeywell, the balance of deferred compensation reaches $80 million. From a diversification perspective, this behavior is inconsistent with Markowitz (1952) and Sharpe (1964), who predict that managers will make their wealth less sensitive to firm performance because they are inherently under-diversified. Executives have substantial human capital invested in the firm (Fama, 1980) and are often required by the board to hold a large amount of firm stock (Lambert et al., 1991; Hall and Murphy, 2002). Thus, the costs of insufficient diversification associated with deferred compensation can be substantial, because executives lose not only their deferred compensation, but also

their human capital (Fama and Jensen, 1983a,b) and firm equity holdings if the firm fails. It is therefore interesting to investigate whether compensation deferral behavior represents firms' use of executive compensation to solve the agency problem, a tax avoidance tool to shift taxable income across time periods, or managerial behavioral biases.

In theory, the optimal compensation contract, consisting of a mixture of cash payouts, equity incentives, pensions, and deferred compensation, should be designed as a whole to maximize firm value. The literature offers two economic reasons for the preference of deferred compensation over current compensation. First, the inside debt literature (Jensen and Meckling, 1976; Edmans and Liu, 2011) illustrates that debt held by executives reduces their incentives to transfer wealth from creditors to shareholders. Thus, deferred *cash* compensation, which has the features of debt, can be used to mitigate the agency cost of debt. However, some firms allow executives to invest deferred compensation balances in the firm's own equity (Anantharaman et al., 2013) or to defer equity compensation. Deferred *equity* compensation is not truly debt-like, and therefore, is unlikely to be used to mitigate the agency cost of debt. Second, Scholes et al. (2002) show that firms prefer deferred compensation when their marginal tax rate will increase and executives' marginal tax rate will decrease in the future. However, they also point out that many substitutes for deferred compensation also allow the shifting of taxable income across time periods. Thus, although the theoretical links between deferred compensation and the agency cost of debt and tax seem straightforward, it is still empirically unclear what drives deferred compensation.

Using hand-collected deferred compensation plans of 376 firms from 2006 to 2012, I examine why compensation is deferred. The major finding is that firms use deferred

compensation to preserve the tax deductibility of non-performance-based compensation rather than to mitigate the agency cost of debt or to reallocate compensation expense from a low-tax year to a high-tax year. IRC 162(m) provides that no public firm is allowed to deduct more than $1 million non-performance-based compensation for a "covered employee." Some firms use time-vested restricted stock to retain key employees (Balsam and Miharjo, 2007) or discretionary bonuses when performance indicators are difficult to specify and/or verify for contracting purposes (Rajan and Reichelstein, 2006). Both time-vested restricted stock and discretionary bonuses are considered non-performance-based compensation and not deductible under IRC 162(m) if salary is close to or greater than the $1 million limitation. If executives defer time-vested restricted stock and discretionary bonuses that are over the $1 million limitation to termination or retirement from the firm, they will be fully deductible when distributed because executives are no longer considered "covered employees" after termination or retirement. My empirical results show that executives who have time-vested restricted stock and/or discretionary bonuses defer $1.1 million more per year than executives who do not have time-vested restricted stock and discretionary bonuses, after controlling for executive total compensation.

An important concern of this finding is that the use of time-vested restricted stock and discretionary bonuses is likely to be endogenous. Unobserved firm characteristics may be correlated with both the use of time-vested restricted stock and discretionary bonuses and the amount of compensation deferred (omitted variable problem). To establish a causal relation, I exploit a recent regulatory change affecting the CFO coverage under IRC 162(m).

On June 4, 2007, responding to the new executive compensation disclosure rules, the IRS released Notice 2007-49 to clarify the definition of "covered employee" under

IRC 162(m). After this notice, CFOs are no longer considered "covered employees." Although CFOs' non-performance-based compensation over $1 million was not deductible under IRC 162(m) before this regulatory change, it is fully deductible after this regulatory change. Thus, this regulatory change provides an exogenous shock to the tax benefits of deferring CFO non-performance-based compensation with no impact on other benefits of deferring CFO non-performance-based compensation. Consistent with the tax deductibility of time-vested restricted stock and discretionary bonuses having a *causal* effect on deferred compensation, I find that before this regulatory change, CFOs who have time-vested restricted stock and/or discretionary bonuses defer $0.82 million more per year than CFOs who do not have time-vested restricted stock and discretionary bonuses, whereas after this regulatory change, the amount of compensation deferred by CFOs is not related to whether they have time-vested restricted stock and/or discretionary bonuses. CEOs, who are not affected by the regulatory change, defer more when they have time-vested restricted stock and/or discretionary bonuses in both the pre and the post regulatory change period. Results of this identification test provide supporting evidence that firms use deferred compensation to preserve the tax deductibility of non-performance-based compensation.

Consistent with executives using deferred compensation to save state income tax, I find that executives who expect to retire soon defer $0.87 million more per year than executives who are not close to retirement. This is more than 30% of their compensation that they are allowed to defer. Law P.L. 104-95 prohibits states from imposing income tax on "retirement income"of their former residents who no longer reside in the state. Cash compensation deferred under the restoration plan is considered "retirement income." Other cash deferrals and stock deferrals are considered "retirement income" if they will be distributed in no less than 10 annual installments

after retirement. Therefore, executives who plan to move to a no (low) income tax state after retirement can enjoy a lower state income tax by deferring their compensation. Consistent with firms short of cash requiring executives to defer more cash compensation, I also find that executives are more likely to defer a significant proportion of cash compensation when the firm faces liquidity constraints.

Since my sample period coincides with the Bush tax cuts that went into effect in 2001 and were extended by President Obama for two more years on Dec 6, 2010, executives who have not retired may defer less because the ordinary income tax rate will be higher when deferred compensation is withdrawn after 2012 (39.6% versus 35%). Resigned executives may defer less because they have to withdraw deferred compensation in lump-sum when terminating from the firm. Lump-sum payments have a shorter investment horizon and may not qualify as "retirement income." Executives who are not allowed to withdraw before termination or retirement from the firm may defer less because their deferrals are more risky.

I perform cross sectional analyses and a set of robustness tests to eliminate these alternative explanations. First, executives working in positive income tax states defer $1 million more per year before retirement, while executives working in zero income tax states do not defer more before retirement. Second, I find executives close to retirement defer more after excluding from the sample resigned executives or executives who are not allowed to withdraw before termination or retirement from the firm. These results provide further support to my argument that executives use deferred compensation to save state income tax.

My study contributes to the compensation literature in three ways. First, it extends Sundaram and Yermack (2007) by exploring the role of deferred compensation in executive compensation design. Due to the limited disclosure requirements for

deferred compensation prior to 2006, Sundaram and Yermack (2007) focus on pensions when they examine the role of inside debt (pensions and deferred compensation) in managerial compensation. Based on the positive association between pensions and firm leverage, they conclude that firms use inside debt to mitigate the agency cost of debt. Using hand-collected deferred compensation plans that are publicly available after the adoption of enhanced executive compensation disclosure rules in 2006, my study provides *causal* evidence that firms use deferred compensation to preserve the tax deductibility of time-vested restricted stock and discretionary bonuses. Thus, it suggests that deferred compensation plays a different role from pensions and is used to reduce the costs of retaining executives and aligning the interests of executives and shareholders.

Second, my study sheds lights on the implications of executive inside debt. Although the inside debt literature documents a negative association between executive inside debt and firm risk (Cassell et al., 2012), the mechanism through which deferred compensation affects firm risk is still unknown. My finding that a large fraction of compensation deferrals is in the form of deferred stock challenges the view that the debt-like feature of deferred compensation causes corporate risk reduction. It suggests that the risk reduction incentives may arise from the equity-like feature and sale restrictions of deferred stock (Kahl et al., 2003).

Third, my results inform the design of compensation contracts for CEOs close to retirement. Smith and Watts (1982) suggest that CEOs with short horizons in the firm have fewer incentives to act in the best interest of shareholders. Consistent with this theoretical prediction, the empirical literature finds that CEOs in their final years in office engage in myopic financial reporting, voluntary disclosure, and investment behavior (Dechow and Sloan, 1991; Kalyta, 2009; Antia et al., 2010; Cassell

et al., 2013). More equity compensation may not help because managers can undo the incentives by selling their stock holdings (Ofek and Yermack, 2000). Contractual constraints on cashing out shares and options are usually lifted after retirement (Bebchuk and Fried, 2010). Thus, to mitigate the horizon problem, firms can incentivize CEOs to hold firm stock after retirement. Since CEOs want to save state income tax by deferring stock compensation before retirement and withdrawing it in ten annual installments, allowing stock deferrals provides managers incentives to keep their wealth sensitive to firm performance after retirement and is an effective way to align the interests of shareholders and CEOs close to retirement.

My study raises an interesting policy question on the effectiveness of the proposal that extends the IRC 162(m) limitation to all equity compensation.[1] Proponents expect that, in response to this proposal, firms will pay less equity compensation, and consequently, less total compensation. However, my finding suggests that this proposal may have an unintended consequence of creating incentives for firms to use deferred compensation to preserve the tax deductibility of equity compensation. Consequently, total compensation of risk averse executives may increase because the value of deferred compensation is sensitive to default risk.

The remainder of this paper is organized as follows. Section 2 discusses the institutional background, reviews previous literature, and develops my hypotheses. Section 3 describes the data and empirical proxies for the constructs of interests. Section 4 discusses the research design. Section 5 presents the empirical results. Section 6 concludes.

[1]The Senate bill 268, CUT Loopholes Act, sponsored by Sen. Levin and Whitehouse, was introduced in the 113^{th} Congress to apply the IRC 162(m) limitation to all equity compensation. It argues that Section 162(m) is broken and encourages firms to grant excessive performance-based compensation that is fully deductible (e.g. non-equity incentives, performance stock (units), and stock options), although Section 162(m) was well-intentioned and its primary goal was to reduce excessive, non-performance-based compensation.

2 Institutional Background, Literature Review, and Hypothesis Development

2.1 Institutional Background

Non-qualified deferred compensation allows executives to set aside all or a portion of their compensation to a later date. The compensation deferred is not included in executives' taxable income until it is finally withdrawn. Unlike compensation deferred under a qualified plan, e.g. 401(k), which is protected under the Employee Retirement Income Security Act of 1974 (ERISA), non-qualified deferred compensation is unfunded, unsecured, and has the same priority as claims of outside creditors. Under a 401(k) plan, a participant's elective deferrals are limited to $17,500 per year,[2] and consequently, a firm's matching contribution on elective deferrals also has a $17,500 cap per year. Non-qualified deferred compensation plans allow executives to make elective deferrals without regard to the $17,500 limit. Some plans provide matching contributions to executives' uncapped elective deferrals,[3] usually following the same matching schedule as the 401(k) plan. The other plans (about 50% in my sample) do not provide any matching contribution or provide matching contribution only if executives defer cash compensation into phantom stock.

Non-qualified deferred compensation is regulated by Section 409A of the Internal Revenue Code for tax purpose, which was enacted on Oct 22, 2004 under Section 885 of the American Jobs Creation Act of 2004 in response to the acceleration of payments to Enron executives their deferred compensation before Enron filed bankruptcy. Prior

[2]The number is set by the IRS and indexed to inflation. Participants 50 or older can defer an additional $5,500.

[3]There is also a limit on the matching contribution of a non-qualified deferred compensation plan, usually 5% to 8% of an executive's eligible income. An executive can defer more than the limit but does not enjoy matching contributions on top of the limit.

to the implementation of Section 409A, deferred compensation plans usually have a so-called "haircut" provision, which permits executives to withdraw all or part of their deferred compensation at any time for any reason, typically with a 10% penalty, making deferred compensation less prone to bankruptcy risk. Section 409A prohibits the use of "haircut" provision and sets many new restrictions on the timing of contributions and distributions. In particular, under Section 409A, elections to defer compensation must be made one year before services are provided and in-service distributions (unscheduled) are only allowed under very specific conditions, e.g. death, disability, etc. Violations of Section 409A results in deferred compensation to be taxable immediately, plus an additional 20% tax penalty and 1% interest. Thus, after the implementation of Section 409A, deferred compensation is not as flexible and its payoff is more sensitive to the incidence of default.

2.2 Literature Review

Sundaram and Yermack (2007) and Gerakos (2010) examine the determinants of CEO defined benefit pensions and find that CEOs are granted more pensions in large firms, high leverage firms, and firms with low growth opportunities, and when CEOs are older, have longer tenure, and are hired from outside the firm. Although executives can negotiate their pensions with the board, they have less discretion on their pensions than on their deferred compensation. Firms have formulas on pensions, which are usually based on the number of years executives have been in the firm and their average earnings in the last three to five years in office (Sundaram and Yermack, 2007). Deferred compensation, on the other hand, is more flexible in the sense that executives can choose whether and how much to defer. Thus, the determinants of pensions and deferred compensation are unlikely to be the same.

Many papers test the inside debt argument in Jensen and Meckling (1976) and Edmans and Liu (2011) by investigating the consequences of granting executives pensions and deferred compensation. They find that firms with more CEO inside debt holdings have lower credit default swap spreads (Bolton et al., 2011), lower cost of debt and looser debt covenants (Anantharaman et al., 2013; Wang et al., 2010), lower accounting conservatism (Chen et al., 2011), lower future stock return volatility (Cassell et al., 2012), and higher liquidation values (Chen et al., 2011). These findings are likely to be endogenous because the determinants of compensation deferrals may be correlated with executive risk-taking incentives. Thus, knowing why executives defer compensation is important to make a causal conclusion on the consequences of debt-like compensation.

Cen (2011) investigates the determinants of CEO inside debt and its components. He finds that the amount of compensation deferred is positively associated with firm's distance to default, and firm size, and negatively associated with firm liquidity. However, the regression R^2 is only 0.08, suggesting that the vast majority of cross-sectional variation in deferred compensation cannot be explained by his model. More importantly, Cen (2011) does not answer the question why some executives defer a huge amount of compensation after Section 409A made the value of deferred compensation sensitive to the incidence of default.

Franco et al. (2013) examine the determinants of outside director compensation deferrals. They find that outside directors are more likely to defer cash compensation to equity when their fees are higher, when firms are more stable, and when firms have better future stock market performances. Compared to outside directors, executives are required to hold more firm stock and their human capital is more sensitive to firm performance. The costs of under-diversification associated with executive compensa-

tion deferrals are much higher. Thus, the determinants of executive compensation deferrals and outside director compensation deferrals are unlikely to be the same.

2.3 Hypotheses Development

2.3.1 Executives' Preferences for Deferred Compensation

Consider the traditional Merton portfolio choice problem (Merton, 1969) with outside income. An executive wants to maximize lifetime utility over consumption:

$$maxE \int_0^\infty e^{-\rho t} u(c_t) dt \tag{1}$$

$$dR_t = \mu(y_t)dt + \sigma(y_t)dz_t \tag{2}$$

$$dy_t = \mu_y(y_t)dt + \sigma_y(y_t)dz_t, \tag{3}$$

where ρ is the discount rate, u is the utility function. At any time t, the executive chooses the amount of wealth to consume, c_t, and allocates the rest between before-tax investment (deferral), D_t, and after-tax investment (no deferral), ND_t. I further assume that the executive invests D_t into a risk free asset and/or a risky asset with a weighted average return R_t, and invests ND_t into the risk free asset with return r_t. R_t follows a diffusion process. $\mu(y_t)$ is the expected value of R_t and is a function of y_t. y_t is a state variable and can be thought of as outside income that cannot be traded.

The Bellman equation of this dynamic programming problem can be written as:

$$V(W, y, t) = \max_{\{c,\alpha\}} u(c)dt + E_t[e^{-\rho dt} V(W_{t+dt}, y_{t+dt}, t + dt)] \tag{4}$$

The executive chooses the amount of consumption, c, and the proportion of wealth

deferred, α, to maximize her utility. Using Ito's lemma to solve this Bellman equation and taking the first order conditions, we can write down the optimal amount deferral as[4]

$$\frac{1}{\gamma}\frac{\mu_t - r_t}{\sigma_t^2} + \frac{\eta}{\gamma}\beta_{dy,dR} \tag{5}$$

where

$$\gamma = -\frac{V_{WW}}{V_W}; \eta = \frac{V_{Wy}}{V_W} \tag{6}$$

γ represents risk aversion and is positive. η measures "aversion" to income risk. V_{Wy} is the partial derivative of the marginal utility, $u'(c)$, with respect to outside income, y. Since risk averse executives will increase current consumption when outside income is high, V_{Wy} is negative. Thus, η is negative because the marginal utility, V_W, is positive. $\beta_{dy,dR}$ is the coefficient of regressing changes in outside income on changes in the return of deferred compensation, and is positive.

The first term of Equation (5) represents the benefit of deferred compensation and suggests that executives defer more when the risk premium, $\mu_t - r_t$, is higher, and when risk, σ_t^2, is lower. The second term represents the cost of deferred compensation and reflects the "diversifying" motive. Since η is negative, executives defer more when $\beta_{dy,dR}$ is smaller. The intuition behind this relation is simple. Executives who want to diversify their portfolio will decrease the amount of compensation deferred if the deferral return covaries positively with their outside income.

Deferred compensation has two tax benefits. The first one is pre-tax rate of return. The intuition is as follows. When an executive defers \$1, the value of this pre-tax

[4]Appendix III provides detailed derivation of the optimal amount of before-tax investment.

investment, V_d, can be represented as

$$V_d = 1 \times (1 + R_d)^n \times (1 - \tau_f - \tau_s) \tag{7}$$

If the executive does not defer this \$1, the value of an after-tax investment in a corporate bond, V_{cb}, can be represented as

$$V_{cb} = 1 \times (1 - \tau_f - \tau_s) \times (1 + R_{cb} \times (1 - \tau_f - \tau_s))^n \tag{8}$$

and the value of an after-tax investment in equity, V_{ce}, can be represented as

$$V_{ce} = 1 \times (1 - \tau_f - \tau_s) \times ((1 + R_{ce})^n \times (1 - \tau_c) + \tau_c) \tag{9}$$

where R_d, R_{cb}, and R_{ce} are the investment return, n is the number of years deferred, τ_f is the federal income tax rate, τ_s is the state income tax rate, and τ_c is the capital gain tax rate. If the investment returns under the three scenarios above are the same ($R_d = R_{cb} = R_{ce}$) and positive, it is easy to show that rate of return of \$1 deferral is greater,[5] which means $\mu_t - r_t$ is positive.

If we assume that τ_c is 0.15, $\tau_f + \tau_s$ is 0.4, and R is 0.08, the benefit of pre-tax rate of return, $\mu_t - r_t$, is less than 2%.[6] Thus, the benefit of pre-tax rate of return is significant only when compensation is deferred for a long period.[7] Under the pre-tax rate of return hypothesis, managers defer more when they have longer horizon.

However, the pre-tax rate of return hypothesis ignores the second term of Equation

[5] $(1 + R_d)^n > (1 + R_{cb} \times (1 - \tau_f - \tau_s))^n$, and $(1 + R_d)^n > (1 + R_{ce})^n \times (1 - \tau_c) + \tau_c$

[6] $V_d - V_{cb} = (\tau_f + \tau_s)(1 - \tau_f - \tau_s)R = 0.0192$, $V_d - V_{ce} = \tau_c(1 - \tau_f - \tau_s)R = 0.0096$.

[7] $\frac{\partial(V_d - V_{cb})}{\partial n} = (1 - \tau_f - \tau s)((1 + R)^n \log(1 + R) - (1 + R(1 - \tau_f - \tau_s))^n \log(1 + R(1 - \tau_f - \tau_s)))$, $\frac{\partial(V_d - V_{ce})}{\partial n} = (1 - \tau_f - \tau s)((1 + R)^n \log(1 + R) - (1 - \tau_c)(1 + R)^n \log(1 + R)$, which are greater than 0 if R is positive.

(5), $\frac{\eta}{\gamma}\beta_{dy,dR}$. Since executive human capital and firm equity holdings are significantly correlated with firm performance, $\frac{\eta}{\gamma}\beta_{dy,dR}$ is negative. Thus, it is ambiguous whether the benefit of pre-tax rate of return outweighs the cost of under-diversification.

The second tax benefit of deferred compensation could be achieved if the marginal tax rate is lower at the distribution date. Unlike rank and file employees, executives are often in the highest tax bracket after retirement, and therefore, cannot enjoy a lower federal tax rate on deferred compensation. However, tax law gives executives an opportunity to enjoy a lower state tax rate on deferred compensation. H.R. 394 was signed into law by President Clinton on January 10, 1996. It prohibits states from imposing income tax on "retirement income" of participants who earned the retirement benefits while they were still residents of a given state, but no longer reside in that state. Compensation deferred is considered "retirement income" if it is either under a restoration plan or under a supplemental plan that pays equal annuities in no less than ten years. Firms usually state that the purpose of a cash deferral plan is to restore the benefits restricted by the limits of the Internal Revenue Code. Thus, most of the cash deferrals could be considered "retirement income." Stock deferrals are considered "retirement income" if they are distributed in annual installments in no less than 10 years after executives retire. Thus, if an executive who worked in New York City moved to Miami after retirement, $\mu_t - r_t$ is more than 8%[8] even if the investment return were 0.

When executives retire, their outside income is less sensitive to firm performance. Human capital is less sensitive to firm performance after executives retire. Although a median CEO has about 6 times her salary in firm stock (Core and Larcker, 2002)

[8]The state income tax rate of New York is 8.97%, the income tax rate of New York City is 3.648%, and the state income tax rate of Florida is 0. Since state income tax paid is deductible from federal income tax, the tax savings from deferred compensation is (8.97% + 3.648% - 0)*65% = 8.2017%.

and executives in several firms are required to hold stock compensation until they retire, their holdings of firm stock are much smaller after they retire (Bebchuk and Fried, 2010). Therefore, $\beta_{dy,dR}$, the sensitivity of deferral return and outside wealth, is much smaller for retired executives. Thus, I expect that executives who expect to retire soon defer their compensation to save state income tax.

Hypothesis 1 (*Retirement Hypothesis*): Executives who expect to retire soon defer more.

Equation (5) has other implications for compensation deferrals. First, the benefit of pre-tax rate of return is positively related to tax rate. Thus, if executives defer their compensation for pre-tax rate of return, the amount of compensation deferred should be positively related to the tax rate because the risk premium, $\mu_t - r_t$, is greater when tax rate is higher. Since federal and capital gain tax are the same for all executives, the pre-tax rate of return hypothesis suggests that executives working in high income tax states defer more.

Second, since μ_t is negatively related to default risk, and σ_t^2 is positively related to default risk, cash deferrals should be negatively associated with default risk. The relation between stock deferrals and default risk is ambiguous. On the one hand, an increase in financial distress risk[9] raises σ_t^2. On the other hand, default risk may be positively associated with expected stock return (Chava and Purnanandam, 2010). Moreover, $\beta_{dy,dR}$ could be lower when default risk is high because agency theory suggests that pay-for-performance sensitivity is negatively associated with firm risk (Holmstrom and Milgrom, 1987, 1991). Thus, the net effect of default risk on D is

[9]I use the terms "financial distress risk" and "default risk" interchangeably throughout this paper.

uncertain.

2.3.2 Firms' Preferences for Deferred Compensation

The discussion thus far ignores the role played by the board in deferred compensation. Under the optimal contracting view of executive compensation, deferred compensation arrangements are negotiated between the board of directors and managers to maximize shareholder value. The literature offers two economic reasons for firms' preferences for deferred compensation. First, Jensen and Meckling (1976) argue that debt held by executives can reduce their incentives to transfer wealth from creditors to shareholders. Edmans and Liu (2011) justify the use of debt-like compensation as a solution to the agency cost of debt. Thus, deferred *cash* compensation, which has the features of debt, can be used to mitigate the agency cost of debt. Under this hypothesis, firms use more deferred compensation when the agency cost of debt is high. Although this inside debt argument is appealing, it is empirically uncertain whether deferred compensation is used to solve this agency problem, because a substantial fraction of executive deferred compensation is in the form of deferred *stocks*. Deferred stocks have the features of both debt and equity, and therefore, do not necessarily reduce executives' incentives to transfer wealth from creditors to shareholders.

Second, Scholes et al. (2002), from a tax perspective, show that deferred compensation can be used as a tax avoidance tool to reallocate compensation expense from a low-tax year to a high-tax year, because compensation expense is deducted from a firm's taxable income when executives receive the payments. Under this hypothesis, firms use more deferred compensation when their current marginal tax rate is low. However, many substitutes for deferred compensation also allow the shifting of

taxable income across time periods (Scholes et al., 2002). Thus, this motivation is unlikely to have a first order effect on deferred compensation, because deferred compensation is less flexible than other compensation arrangements in tax planning after Section 409A places strict timing rules on deferral elections and distributions.

I argue that firms use deferred compensation to preserve the tax deductibility of non-performance-based compensation that plays an important role in managerial incentive provisions. Tax deductibility of executive compensation is governed by Section 162(m) of the Internal Revenue Code, which was amended by the Revenue Reconciliation Act of 1993. IRC Section 162(m) generally provides that annual compensation (other than compensation based on performance goals approved by shareholders every five years) over $1 million is not deductible if paid to a "covered employee" of a public corporation. Thus, a covered employee's non-performance-based compensation over the $1 million limit cannot be deducted from the firm's current taxable income. Non-performance-based compensation usually includes salary, time-vested restricted stock and cash incentives, and discretionary bonuses. Previous literature documents that firms take into consideration the tax deductibility of executive compensation when designing a compensation contract. In particular, Hall and Liebman (2000) find that the passage of Section 162(m) led firms to decrease CEO salary and Rose and Wolfram (2002) find that firms responded to the implementation of IRC Section 162(m) by reducing CEO salary to below $1 million so that all CEO salary is deductible. Perry and Zenner (2001) find that bonus and total compensation are more sensitive to stock returns after 1993, suggesting that firms substitute salary with performance-based compensation to preserve tax deductibility.

Unlike salary, time-vested restricted stock and discretionary bonuses play an important role in managerial incentive provisions, which cannot be served by performance-

based compensation. Time-vested restricted stock usually has a two to five-year vesting schedule and the unvested part is forfeited upon executive departure. Thus, time-vested restricted stock provides executives incentives to remain with the firm. Consistent with firms using forfeitable equity compensation for executive retention, previous studies find that the value of restricted stock holdings is negatively associated with voluntary executive turnover (Balsam and Miharjo, 2007) and that executives who work in R&D intensive industries have larger unvested stock holdings (Erkens, 2011). Firms that want to recruit executives from other firms may also have to grant time-vested restricted stock to reimburse these executives for the forfeiture of unvested compensation from their former employer. Although stock options (performance-based) also play a retention role (Oyer, 2004; Oyer and Schaefer, 2005), their economic costs are higher than restricted stock (Hall and Murphy, 2002) and their effectiveness decreases substantially when options become deeply underwater (Carter and Lynch, 2001, 2004). Discretionary bonuses are usually used when performance indicators are difficult to specify and/or verify for contracting purposes. Holmstrom (1979) argue that optimal incentive schemes should include any signal that is incrementally informative about an agent's non-contractible actions. Rajan and Reichelstein (2006) demonstrate that discretionary bonuses are optimal when subjective information must be used to create incentives for a group of agents.

Since salary is non-performance-based and usually close to or more than $1 million, a substantial proportion of time-vested restricted stock and discretionary bonuses is not qualified for a current tax deduction. Deferred compensation provides firms a way to preserve the tax deductibility of time-vested restricted stock and discretionary bonuses. If executives defer time-vested restricted stock and discretionary bonuses to termination or retirement from the firm, they will be deducted from the firm's

taxable income when distributed, because executives terminating or retiring from the firm are no longer considered "covered employees", and therefore, not subject to Section 162(m). Thus, I expect executives defer time-vested restricted stock and discretionary bonuses.

Hypothesis 2 (*162m Hypothesis*): Executives with time-vested restricted stock and discretionary bonuses defer more.

Previous studies argue that liquidity constraints are an important determinant of executive compensation structure and find that firms with liquidity constraints use more equity compensation in lieu of cash compensation (Dechow et al., 1996; Core and Guay, 1999). Sundaram and Yermack (2007) find weak evidence that firms use more pensions when they have liquidity constraints. I expect that both the CEO and the CFO will defer more cash compensation when a firm has liquidity constraints because liquidity constraints should affect cash deferrals of all executives. Stock deferrals, on the other hand, should not be related to firm liquidity constraints.

Hypothesis 3 (*Liquidity Constraint Hypothesis*): Both the CEO and the CFO defer a greater proportion of cash compensation when the firm has liquidity constraints.

3 Sample Selection, Variable Measurement, and Descriptive Statistics

3.1 Sample Selection

On July 26, 2006, the SEC adopted final rules to revise Item 402 of Regulation S-K of the Securities Act of 1933. Firms with fiscal years ending on or after Dec. 15, 2006 have been required to provide a tabular representation of each named executive officer's non-qualified deferred compensation in the annual proxy statements. They also need to disclose the material terms of the deferred compensation plan, e.g. the matching contributions the firm provides, which part of compensation is allowed to defer, and the minimum years the compensation deferred has to remain in the account. Although ExecuComp provides executives' and firms' contributions to deferred compensation, it does not contain any material terms reported in the narrative disclosure, which are important to understand compensation deferral decisions. Therefore, I hand collect the material terms of firms' non-qualified deferred compensation plans from their annual proxy statements.

Following previous literature examining the determinants of CEO defined benefit pensions (Sundaram and Yermack, 2007), I obtain my initial sample from the 2006 Fortune 500 ranking of U.S. firms. From these 500 firms, I first delete firms that do not have a non-qualified deferred compensation plan.[10] Then, I delete financial firms (SIC codes 6000-6999) since Section 956 of the Dodd-Frank Act requires executive officers of larger covered financial institutions with $50 billion of total assets to de-

[10]Firms are dropped if they do not have any observation in the deferredcomp dataset of the ExecuComp Database. Some firms that do not have an active deferred compensation plan may still have observations in the deferredcomp dataset if these firms provide discretionary contributions or an executive has positive balance in deferred compensation. These firms are dropped from the sample in the last step of my sample selection.

fer 50% of incentive-based compensation. Therefore, compensation deferral decisions of executives in these financial firms are unlikely to be driven by executive characteristics, firm characteristics (other than firms' total assets), and material terms of deferred compensation plans. I also delete firms in the utility industry (SIC codes 4900-4999) because their executive compensation is subject to regulatory supervision. This procedure reduces the number of firms in my initial sample from 500 to 291. Finally, since firms in the Fortune 500 are all large firms, I collect an additional 100 randomly chosen firms from S&P SmallCap 600 list. After merging with accounting data from Compustat and stock return data from CRSP and dropping firms that do not have an active deferred compensation plan, my sample contains 376 firms and 4,438 observations (CEO&CFO).

3.2 Variable Measurement

3.2.1 Proxies for Section 162(m) deductibility of executive compensation: $162m$ and $162ms$

IRC Section 162(m) generally provides that annual compensation (other than compensation based on performance goals approved by shareholders every five years) over $1 million is not deductible if paid to a "covered employee" of a public corporation. In annual proxy statements, firms report the tax deductibilities and consequences of their compensation policies and specify which type of executive compensation is performance-based or non-performance-based. I hand collect this information from proxy statements.[11] In particular, I use two proxies for Section 162(m) deductibility. I determine the first proxy, $162m$, by only considering time-vested restricted stock

[11] To the extent that some firms do not explicitly state that they have non-performance-based compensation in their proxy statements, my findings will understate the impact of Section 162(m) deductibility on the amount of compensation deferred.

and discretionary bonuses. $162m_{i,t}$ is an indicator variable equal to 1 if executive i in year t has time-vested restricted stock and/or discretionary bonuses, and 0 otherwise. I expect that $162m_{i,t}$ is positively correlated with deferred compensation. I consider salary, time-vested restricted stock, and discretionary bonuses when I determine the second proxy, $162ms$. $162ms_{i,t}$ is an indicator variable equal to 1 if executive i in year t has more than a \$1 million salary or has time-vested restricted stock and/or discretionary bonuses, and 0 otherwise. In other words, $162ms_{i,t} = 1$ if $162m_{i,t} = 1$ or the salary of executive i in year t is over \$1 million. The correlation between $162m$ and $162ms$ is 0.51. Salary is not performance-based compensation, and therefore, the part of salary that is over \$1 million does not qualify for a current tax deduction. However, for executives who have more than a \$1 million salary, the median amount that is not deductible under Section 162(m) (the over \$1 million part) is only about \$200 thousand, which, even if not deferred, should have little impact on corporate income tax. Moreover, previous studies find that firms substitute salary with performance-based compensation in response to the implementation of Section 162(m), suggesting that firms that keep paying more than a \$1 million salary might put less weight on tax considerations when designing compensation contract, and therefore, do not use deferred compensation to preserve tax deductibility. Thus, the association between $162ms_{i,t}$ and deferred compensation should be lower than the association between $162m_{i,t}$ and deferred compensation.

Some executives in my sample have time-vested restricted stock that is not allowed to defer. $162m$ of these executives is set to 0 because time-vested restricted stock is unlikely to affect deferred compensation.

3.2.2 Proxy for executive's expectation to retire soon: *Retire*

Since it is impossible to observe executives' expectations of retirement, I use the observed retirement events to proxy for executives' expectations. $Retire_i$ is an indicator variable equal to 1 if an executive i retired from the firm during 2006-2012 and does not take a non-director position (CEO, CFO, COO, et al.) in another firm, and 0 otherwise.[12] In particular, I first collect all CEO and CFO data from ExecuComp for the firms in my sample and *Retire* is set to 0 if a CEO or CFO has full coverage during 2006-2012 in the same firm (identified using a unique executive id *co_per_rol*). For CEOs and CFOs who do not have full coverage, I read firms' proxy statements to check if they retired, resigned, or were promoted to another position in the firm. If an executive was promoted to another position in the firm, e.g. from CFO to COO, and stays in the new position to the end of 2012, both *Retire* and *Resign* are set to 0. If an executive resigned from the firm, *Resign* is set to 1 and *Retire* is set to 0. If an executive retired from the firm, I search her position on *Forbes* and *Business Week*. If she has a current executive (non-director) position in another firm, *Retire* is also set to 0. The reason is that the retirement hypothesis relies on the fact that CEOs and CFOs who plan to live in a no (low) income tax state after retirement can save state income tax by deferring compensation before retirement and withdrawing it after. If they work in another state after they retired, they may incur net tax loss if the state they are currently working in charges higher income tax.[13] If an executive

[12] To the extent that executives who expect to retire right after 2012 also defer their compensation to save state tax, my findings will understate the impact of retirement expectation on the amount of compensation deferred.

[13] There are two cases in which a CEO resigned and worked in another firm in a state with no income tax. I do not expect these two CEOs have the same incentives as *Retire* CEOs as they may not know ex-ante where they are going to work 3 to 5 years before they leave the firm. In the robustness check (untabulated), I also set *Retire* of these two CEOs to 1 and redo all the tests, all results still hold.

does not have a current executive position in another firm, *Retire* is set to 1.

3.2.3 Proxies for liquidity constraints: *Cash Flow* and *DIV_Change*

Since it is difficult to distinguish financial constraints from financial distress risk (Whited and Wu, 2006), commonly used proxies for financial constraints, e.g. KZ index (Kaplan and Zingales, 1997) and WW index (Whited and Wu, 2006), are not good candidates to measure liquidity constraints in my setting because executives have fewer incentives to defer cash compensation when financial distress risk is high. I need a proxy of liquidity constraints that is not highly correlated with default risk. My first proxy of liquidity constraints is *Cash Flow*, defined as operating cash flow divided by total assets. This proxy relies on a simple premise that firms need cash to pay executive cash compensation. The second proxy of liquidity constraints is the change in dividend payout, *DIV_Change*. Cleary (1999) argues that firms that cut dividends are more likely to have financial constraints. Following Kothari et al. (2008), I define the change in dividend as $[Div(t) - Div(t-1)]/Div(t-1)$. Liquidity constrained firms have lower *Cash Flow* and *DIV_Change*.

3.3 Descriptive Statistics

Table 1 describes the material terms of the non-qualified deferred compensation plans. The first three rows present the types of compensation that deferred compensation plans allow executives to defer. The majority of the firms in my sample allow executives to defer salary and cash incentives, while only 63 out of 376 firms allow executives to defer stock compensation. The second three rows report the investment choices that firms provide. Most firms, 307 out of 376, give executives a list of mutual funds to invest. Less than 50 percent of firms allow executives to invest compensation

deferred in fixed income securities or phantom stock. Roughly 50 percent of firms provide matching contributions to executive deferrals, and 81 out of 376 firms provide discretionary contributions that do not require executive deferrals. Executives in 47 percent of firms cannot withdraw their deferrals before terminating or retiring from the firm.

I report the descriptive statistics in Table 2. All variables are defined in Appendix I. The average executive contribution is $269 thousand per year, while the median is only $22 thousand, suggesting that a small number of executives defer large amounts of compensation, while most executives defer a tiny portion of their compensation. 9 percent of the observations have time-vested restricted stock and/or discretionary bonuses. 26 percent of the observations have more than a $1 million salary or have time-vested restricted stock and/or discretionary bonuses. 7.7 percent of the executives are classified as "retirement". 15.2 percent of the executives are classified as "resign." 56 percent of the observations are qualified for matching contributions. Approximiately 50 percent of the observations have pensions.

Table 3 reports the Pearson correlation between the main variables. Consistent with Hypothesis 1 and 2, the amount of compensation deferred is positively correlated with $162m$ and $Retire$. The amount of compensation deferred is negatively correlated with $Volatility$ and $Leverage$, suggesting that executives defer less when default risk is high. State income tax and total compensation are also positively correlated with the amount of compensation deferred.

Figure 1 presents the timeline of deferral elections for salary. As required by Section 409A, an executive must make deferral elections before the year in which the service is performed. Therefore, the executive must make deferral election for year $t+1$ salary before the end of year t. If the executive chooses not to defer, the amount

of salary, C, is deducted from the firm's taxable income. If the executive chooses to defer the salary to retirement, the firm will deduct both the amount of salary, C, and any appreciation after deferral, I, when they are withdrawn.

Figure 2 displays the timeline of deferral elections for time-vested restricted stock. Suppose the restricted stock is granted in year t when the stock price is X and will be vested in year $t+2$. An executive must make deferral election for the stocks before the end of year $t+1$. If the executive chooses not to defer, neither the grant date value, X, nor the appreciation, K, can be deducted from the firm's taxable income if the executive has other non-performance-based compensation over \$1 million. If the executive chooses to defer the stocks to retirement, the firm will deduct both the grant date value, X, and any appreciation after the stocks are granted, H, when they are withdrawn.

Figure 3 displays the time trend of compensation deferrals during 2006 and 2012. The mean deferrals were around \$400 thousand in 2006 and 2007 and fell by almost 50% in 2009, 2010, and 2011. The median deferrals have the same trend. They were \$30 thousand in 2006, 2007, and 2008, and declined sharply in 2009. The median deferrals were around \$10 thousand during 2009 and 2012. Since stock volatility rose sharply in 2009 due to the financial crisis, this time trend is consistent with the theoretical prediction of the Merton model that executives defer less when risk is high.

Figure 4 presents the mean and median deferrals by whether executives have time-vested restricted stock and/or discretionary bonuses ($162m$) and whether executives expect to retire soon ($Retire$). Executives on average defer \$113 thousand per year when they do not have time-vested restricted stock and discretionary bonuses ($162m = 0$) and they do not expect to retire soon ($Retire = 0$). When executives expect

to retire soon ($Retire = 1$), the average annual compensation deferrals are \$1.1 million. When executives have time-vested restricted stock and/or discretionary bonuses ($162m = 1$), their average compensation deferrals are \$1.2 million. $162m$ and $Retire$ seem to reinforce each other in the sense that the average compensation deferrals are \$2.9 million when executives have time-vested restricted stock and/or discretionary bonuses and they expect to retire soon. This is not surprising because executives have more incentives to defer their non-performance-based compensation when they expect to retire soon.

4 Research Design

I estimate the following regression model to examine the impacts of section 162(m) deductibility and retirement on deferred compensation:

$$Defer_{i,t} = \alpha_0 + \alpha_1 162m_{i,t}(162ms_{i,t}) + \alpha_2 Retire_i + \sum \beta X_{i,t} + \epsilon_{i,t} \qquad (10)$$

$Defer_{i,t}$ represents one of the three variables used to proxy for compensation deferred by executive i in year t. The first variable is the amount of compensation deferred by executive i in year t, $Contribution\_Exec_{i,t}$. Since this variable is highly skewed, I use two transformations of $Contribution\_Exec_{i,t}$ to proxy for $Defer_{i,t}$. In particular, the first transformation is the logarithm of the amount of compensation deferred plus 1, $\log(1 + Contribution\_Exec_{i,t})$, and the second transformation is the ratio of the amount of compensation deferred to total compensation, $Contribution\_Exec_{i,t}/Total_{i,t}$. $162m$ ($162ms$) and $Retire$ are defined in Section 3.2, and X are control variables. The main variables of interest are whether an executive has time-vested restricted stock and/or discretionary bonuses (whether an execu-

tive has non-performance-based compensation not deductible under Section 162(m)), $162m$ ($162ms$), and whether an executive expects to retire soon, *Retire*. I expect that $Defer_{i,t}$ is positively related to $162m$ ($162ms$) and *Retire*.

Then, I use the following logistic regression model to examine the impact of firm liquidity constraints on the proportion of cash compensation deferred:

$$Large\_Cash_{i,t}\ (Large\_Stock_{i,t}) = \alpha_0 + \alpha_1 Liquidity\_Constraint_{i,t} + \sum \beta Y_{i,t} + \epsilon_{i,t} \tag{11}$$

where $Large\_Cash_{i,t}$ is an indicator variable equal to 1 (significant cash deferral) if both the CEO and the CFO in firm i defer 20% cash compensation in year t, and 0 (insignificant cash deferral) otherwise.[14] I use the proportion rather than the amount to identify significant cash deferrals for the following two reasons. First, the cash compensation of an average CFO is less than 50% of the cash compensation of an average CEO. Thus, it is unlikely that firms experiencing liquidity constraints require the same amount of cash deferrals for the CEO and the CFO. Second, since firms with liquidity constraints may use less cash compensation ex-ante, the thresholds of significant amount should vary for executives with different cash compensation. $Liquidity\_Constaint_{i,t}$ represents one of the two proxies of firm $i's$ liquidity constraints in year t discussed in Section 3.2.3. $Y_{i,t}$ are control variables. The main variable of interest is whether a firm has liquidity constraints (*Liquidity_Constraint*). I expect a significantly negative relation between $Large\_Cash_{i,t}$ and proxies for liquidity constraints.

[14] 20% threshold is chosen to make the proportion of deferrals material, and at the same time, keep enough observations in the large deferral group to identify the effect of liquidity constraint on the cash deferrals. About 10% of observations in my sample defer more than 20% cash compensation. I also use 15% threshold in defining $Large\_Cash_{i,t}$, proxies of liquidity constraint are still significantly related to $Large\_Cash_{i,t}$ with expected sign (untabulated).

Based on the theoretical predictions of the Merton portfolio choice model, I use control variables to investigate the incremental explanatory power of $162m(162ms)$ and *Retire*. I control for state income tax and expect that executives who work in a high income tax state defer more if executives defer their compensation for pre-tax rate of return.

Campbell and Taksler (2003) find that firm idiosyncratic volatility explains a significant part of cross-sectional variation in corporate bond yields. Thus, I use idiosyncratic volatility, $Volatility$, which is measured as the standard deviation of the residual of the market model using previous 36-month returns, to proxy for default risk. A firm is more likely to default if its $Volatility$ is higher.

I use total compensation to control for the effects of wealth and risk aversion on the amount of compensation deferred. Under constant relative risk aversion, wealthier executives are less risk averse (Ross, 2004), and therefore, would defer more.

Following Sundaram and Yermack (2007), I control for a firm's tax status by including an indicator variable, NOL, for whether the firm has net operating loss carry-forwards on its balance sheet. Scholes et al. (2002) show that firms prefer deferred compensation when their marginal tax rate will increase in the future. If firms use deferred compensation to reallocate compensation expense from a low-tax year to a high-tax year, compensation deferred should be positively associated with NOL.

I use future stock return to control for executives' private information. Executives may defer cash compensation into phantom stock or defer stock compensation if their private information suggests that such deferrals are profitable. Franco et al. (2013) find that outside directors are more likely to defer their cash compensation into firm stock when they expect future firm performance is good. On the other hand, if

executives defer their cash compensation into either fixed income securities or mutual funds, or they are not allowed to defer restricted stock, their deferral decisions should not be affected by private information about future firm performance. Therefore, it is unclear ex-ante whether the amount of deferrals are affected by future stock return.

I use leverage to proxy for the agency cost of debt. The inside debt literature argues that firms use pensions and deferred compensation to mitigate the agency cost of debt (Sundaram and Yermack, 2007). If that is the case, compensation deferred should be positively associated with leverage.

I also control for a firm's growth opportunities by including its market to book ratio. Firms with more investment opportunities may encourage executives to defer cash compensation into phantom stock or defer stock compensation so that managers' interests are more aligned with shareholders' interests. However, since growth firms are more likely to use equity compensation (Smith and Watts, 1992), the pay-for-performance sensitivity is higher for executives in growth firms. Therefore, the optimal amount of compensation deferred could be lower.

5 Empirical Results

5.1 Main Tests

Table 4 reports the results of the impact of Section 162(m) deductibility and retirement on deferred compensation. The first two columns report the Tobit regression results of using the amount of compensation deferred, $Contrib\_Exec$, as the dependent variable. As predicted, I find that the coefficients on $162m$ and $Retire$ are statistically significant ($p - value = 0.0063$ and 0.0095, respectively). Executives who have time-vested restricted stock and/or discretionary bonuses defer $1.1 million

more than executives who do not have time-vested restricted stock and discretionary bonuses. Executives who retired during 2006-2012 deferred $0.87 million more than executives who have not retired yet. These amounts are also economically significant since the median deferral is only $22 thousand per year. The coefficient on state tax is 27, and is significant at 1 percent. This suggests that a 1 percent increase in state income tax is associated with $27 thousand more deferrals or one standard deviation increase in state income tax is associated with $81 thousand more deferrals. So, the economic significance of the effect of state income tax on compensation deferrals is much smaller than that of Section 162(m) deductibility and retirement. Deferred compensation is also positively correlated with total compensation. A $1 million increase in total compensation leads to $93 thousand more compensation deferrals. Neither *Leverage* nor *NOL* is correlated with deferred compensation, suggesting that firms do not use deferred compensation to mitigate the agency cost of debt or to reallocate compensation expense from a low-tax year to a high-tax year.

The second two columns report the results of using the logarithm of the amount of compensation deferred plus 1, log(1+*Contrib_Exec*), as the dependent variable. The coefficients on 162*m* and *Retirement* are 1.8834 and 1.4297, respectively, suggesting that the logarithm of deferred compensation is 188 percent higher when executives have time-vested restricted stock and/or discretionary bonuses and 143 percent higher when executives expect to retire. The last two columns report the results using the ratio of the amount of compensation deferred to total compensation, *Contrib_Exec/Total*, as the dependent variable. The coefficients on 162*m* and *Retirement* are 0.0969 and 0.0868, respectively, suggesting that executives who have time-vested restricted stock and/or discretionary bonuses defer 10 percent more compensation than executives who do not have time-vested restricted stock and dis-

cretionary bonuses, and executives who expect to retire soon defer 9 percent more compensation than executives who are not close to retirement. The results of the last four columns suggest that the significance of the coefficients in the first two columns is not affected by the skewness of the dependent variable, *Contrib_Exec*. To make the interpretation of the coefficients more straightforward, I use the amount of compensation deferred, *Contrib_Exec*, as the dependent variable in further tests of my hypotheses.

Table 5 reports the results of using $162ms$ to proxy for the deductibility of executive compensation. Recall that $162ms_{i,t}$ is an indicator variable equal to 1 if executive i in year t has more than a $1 million salary or has time-vested restricted stock and discretionary bonuses, and 0 otherwise. In other words, $162ms_{i,t} = 1$ if $162m_{i,t} = 1$ or the salary of executive i in year t is over $1 million. As expected, $162ms$ is not significantly correlated with *Contrib_Exec*. It is correlated with log(1+*Contrib_Exec*) and *Contrib_Exec/Total*, but the magnitude of the coefficients is much smaller. The results in Table 5 suggest that firms may not use deferred compensation to preserve the tax deductibility of salary over $1 million, because it has small tax consequences.

Table 6 reports the results of the impact of liquidity constraints on the probability of large cash deferrals. Consistent with executives deferring more cash compensation when firms are short of cash, I find that the coefficients on both proxies of liquidity constraints are statistically significant ($p - value = 0.0354$ and 0.0079, respectively). The marginal effects of *Cash Flow* and *DIV_Change* are -1.0127 and -0.0550, respectively, suggesting that, ceteris paribus, the likelihood of a significant proportion of cash deferrals is 7 percent higher when there is a one standard deviation decrease in *Cash Flow* and *DIV_Change*, consistent with the liquidity constraint hypothesis.[15]

[15]In an untabulated analysis, I find that the incidence of a large proportion of stock deferrals by the CEO and the CFO is not positively related to firm liquidity constraints.

The results in Table 4 and Table 5 provide initial evidence that Section 162(m) deductibility and retirement are two important determinants of deferred compensation. However, firms' compensation policies are endogenous. Omitted firm characteristics could be correlated with both the use of time-vested restricted stock and/or discretionary bonuses and deferred compensation, undercutting the ability to make a causal conclusion on the effect of the tax deductibility of non-performance-based compensation on deferred compensation. For example, time-vested restricted stock is usually used for retention purposes. However, retention is unlikely to explain the observed results because time-vested restricted stock, even if deferred, is still fully vested and payable to executives upon departure. Firms may also issue time-vested restricted stock to more tightly align the interests of managers and shareholders. Firms' with alignment motivations may encourage executives to defer their time-vested restricted stock so that they focus more on the firm's long term performance (Bebchuk and Fried, 2010). To mitigate this endogeneity concern, I exploit a regulatory change that excluded CFOs from "covered employee" under Section 162(m) to examine the causal relation between the tax deductibility of non-performance-based compensation and deferred compensation. I discuss the regulatory change and further tests of $162m$ hypothesis employing this regulatory change in the next section.

5.2 Further Tests of $162m$ Hypothesis

Before the regulatory change, Section 162(m) generally defined "covered employee" as (1) the chief executive officer, or (2) the employees whose compensation is required to be reported by reason of they being among the four highest paid officers other than the CEO. Since almost all CFOs were one of the four highest paid officers before the regulatory change, they were "covered employees" under Section 162(m).

However, the SEC revised item 402(a)(3) of Regulation S-K in the new executive compensation disclosure rules on Dec 15, 2006 and requires public firms to disclose compensation of the CEO, the CFO, and the three most highly compensated officers other than the CEO and the CFO. Disclosure of the CFO's compensation is now required, regardless of whether the CFO is one of the four highest paid officers. This caused confusion as to whether the CFO is still a "covered employee" under Section 162(m). On June 4, 2007, the IRS released Notice 2007-49 to clarify the definition of "covered employee" under Section 162(m)(3). "Covered employee" now includes (1) the CEO, and (2) the three most highly compensated officers other than the CEO and the CFO. Consequently, the CFO is not subject to Section 162(m) after the new executive compensation disclosure rules were implemented.

This regulatory change provides an exogenous shock to the tax benefits of deferring CFO time-vested restricted stock and discretionary bonuses with no impact on other benefits of deferring CFO time-vested restricted stock and discretionary bonuses. Therefore, it allows me to eliminate alternative explanations discussed above. If the amount of compensation deferred is not driven by the tax deductibility of non-performance-based compensation, we should observe a positive correlation between both CEO deferrals and CFO deferrals and the use of time-vested restricted stock and/or discretionary bonuses because alternative explanations apply to both CEOs and CFOs. Moreover, we should not observe a significant change in the relation between CFO deferrals and the use of time-vested restricted stock and/or discretionary bonuses pre and post the regulatory change because alternative explanations do not vary over time.

I first show the median deferrals by CEOs and CFOs pre and post the regulatory change in Figure 5a and Figure 5b. Consistent with the time trend of compensation

deferrals displayed in Figure 3, both CEOs and CFOs contribute less to deferred compensation post the regulatory change. However, the median deferrals shown in Figure 5 are inconsistent with alternative explanations discussed above. In particular, the amount of compensation deferred by CEOs who have time-vested restricted stock and/or discretionary bonuses ($162m = 1$) is significantly greater pre and post the regulatory change than the amount of compensation deferred by CEOs who do not have time-vested restricted stock and discretionary bonuses ($162m = 0$). The amount of CFO deferrals when $162m = 1$, on the other hand, is only significantly greater before the regulatory change.

Next, I examine the impact of the use of time-vested restricted stock and/or discretionary bonuses on the amount of compensation deferred by CEOs and CFOs separately and report the results in Table 7. Consistent with the results of the main tests in Table 4, I find that the coefficient on $162m$ is statistically significant ($p-value = 0.0073$) for the CEO sample. The coefficient on $162m$ is insignificant ($p - value = 0.1052$) for the CFO sample. Next, I interact $162m$ with CEO, which equals one if an executive is a CEO, and 0 if she is a CFO, and conduct the full sample test. The coefficient on $162m$ represents the impact of the use of time-vested restricted stock and/or discretionary bonuses on the amounts of compensation deferred by CFOs and is insignificant ($p - value = 0.1486$). The coefficient on $162m \times CEO$ represents the incremental impact of the use of time-vested restricted stock and/or discretionary bonuses on the amount of compensation deferred by CEOs and is statistically significant ($p - value = 0.0388$).

Table 8 shows the impact of the use of time-vested restricted stock and/or discretionary bonuses on CFO deferrals pre and post the regulatory change. Although in Notice 2007-49 released on June 4, 2007, the IRS informally indicated that the new

rules are effective for fiscal years ending on or after December 15, 2006, IRC section 409A requires that executives make their fiscal year t compensation deferral decisions by the end of fiscal year $t-1$. Therefore, year 2007 compensation deferral decisions had already been made when the IRS clarified the application of Section 162(m) on CFOs in Notice 2007-49. So I classify 2006 and 2007 as the pre-regulatory change sample period and 2008 to 2012 as the post-regulatory change sample period.

When the CFO sample is partitioned by the regulatory change, the coefficient on $162m$ for the pre-regulatory change sample is 818.9 and statistically significant ($p-value = 0.0185$), while the corresponding number for the post-regulatory change sample is 57.6 and statistically insignificant ($p-value = 0.4849$). In terms of the economic significance, when the CFO is still a "covered employee" under section 162(m), CFOs who have time-vested restricted stock and/or discretionary bonuses defer \$0.82 million more than CFOs who do not have time-vested restricted stock and discretionary bonuses, while the corresponding number is \$58 thousand after the CFO is no longer a "covered employee".[16]

Taken together, results in Figure 5, Table 7, and Table 8 provide supporting evidence on the $162m$ hypothesis: firms use deferred compensation to preserve the tax deductibility of time-vested restricted stock and discretionary bonuses.

5.3 Further Tests of Retirement Hypothesis

The *Retirement* hypothesis predicts that executives who plan to move to a zero (low) income tax state after retirement will defer their compensation to save state income tax. If the *Retirement* hypothesis drives the observed positive association

[16] In the robustness check, I also conduct the same test for the CEO sample pre and post the regulatory change (untabulated), coefficients on $162m$ are significant in both the pre and post regulatory change samples.

between *Retire* and the amount of compensation deferred in Table 4, this association should be more pronounced for executives working in positive income tax states and insignificant for executives working in zero income tax states.

Table 9 presents the Tobit regression results for executives working in positive income tax states and zero income tax states, respectively. Consistent with the *Retirement* hypothesis, the coefficient on *Retire* is significantly positive ($P-value = 0.0122$) for the positive state tax subsample and statistically insignificant ($p-value = 0.8753$) for the zero state tax subsample. Regarding the economic significance, executives working in positive income tax states defer \$1.06 million more per year when they expect to retire soon, while executives working in zero income tax states defer only \$15 thousand more per year when they expect to retire soon.

I also interact *Retire* with $Tax\ ID$, which equals 1 for executives working in positive income tax states, and 0 otherwise, and conduct the full sample test. The coefficient on *Retire* in this test represents the impact of retirement on the amount of compensation deferred by executives working in zero income tax states and is statistically insignificant ($p-value = 0.6757$). The coefficient on $Retire \times Tax\ ID$ represents the incremental effect of retirement on the amount of compensation deferred by executives working in positive income tax states and is statistically significant ($p-value = 0.0063$). The coefficient on $Tax\ ID$ is -242, suggesting that executives working in positive income tax states do not defer more than executives working in zero income tax states if they do not expect to retire. This finding is inconsistent with executives deferring compensation for pre-tax rate of return because the benefit of pre-tax rate of return is higher when executives work in high income tax states and have longer horizons.

Results in Table 9 not only provide cross sectional evidence of the *Retirement*

hypothesis but also eliminate an alternative explanation for results in Table 4. Federal personal income tax rates during my sample period coincide with the Bush tax cuts that went into effect in 2001 and were extended by President Obama for 2 more years on Dec 6, 2010. Thus, executives who have not retired may have fewer incentives to defer because the ordinary income tax rates will be higher when they receive the payments after 2012 (39.6% versus 35%). Under this explanation, retired executives in both zero income tax states and positive income tax states should defer more, inconsistent with the results in Table 9.

My sample includes three types of executives, *Retire*, *Resign*, and the remainder of executives. Recall that, an executive is classified into *Resign* group if she resigned from the firm (no matter whether she works in another firm after she resigned). When executives resign from the firm (either voluntarily or forced), their compensation deferred is distributed in a $lump-sum$ upon departure. However, when executives retire from the firm, they can choose to receive their deferred compensation in annual *installments* up to 15 years. Since *Resign* executives may know they will resign, they may defer less because their deferred compensation has a shorter investment horizon.

To eliminate this alternative explanation, I re-estimate the Tobit regression Model (2) after dropping *Resign* executives (674 observations) from the full sample and report the results in the first two columns of Table 10. The coefficient on *Retire* is 893.065 and statistically significant ($p-value = 0.0148$). This result provides further support to the *Retirement* hypothesis.

Since 47 percent of the firms in my sample do not allow distributions before termination or retirement from the firm, another alternative explanation for retired executives deferring more is that these executives are qualified for distribution soon

after they retire, and consequently, the deferrals are not as risky. Under this explanation, retired executives do not defer more than executives who can withdraw before terminating or retiring from the firm. To eliminate this explanation, I exclude from the sample executive-year observations that no distributions are allowed before termination or retirement from the firm and $Retire = 0$. In other words, the new subsample includes only executives who retired during the sample period ($Retire = 1$) and executives who can withdraw before terminating or retiring from the firm (*Early Distributors*).[17] I present the results of this subsample analysis in the last two columns of Table 10. The coefficient on *Retire* is 1171.48 and statistically significant ($p-value = 0.0008$). Retired executives defer \$1.17 million more per year than *Early Distributors*, strengthening the *Retirement* hypothesis.

6 Conclusion

Some executives defer a large amount of compensation, especially stock compensation, under their non-qualified deferred compensation plans. This behavior seems puzzling given executives' under-diversified position in the firm and potential default. Using a hand-collected sample of 376 firms and 4,438 executive-year observations from 2006 to 2012, this paper examines why compensation is deferred.

Consistent with firms using deferred compensation to preserve the tax deductibility of non-performance-based compensation, I find a positive relation between the amount of compensation deferred and the use of time-vested restricted stock and discretionary bonuses. To make a *causal* conclusion on this relation, I employ a reg-

[17] *Early Distributors* are usually allowed to withdraw their contributions 2 to 5 years after their initial contributions following a pre-specified schedule. Note that although *Early Distributors* are allowed to specify the number of years they want to defer, they still have to comply with IRC Section 409A in the sense that the distribution has to follow pre-specified schedules.

ulatory change on the coverage of CFOs under Section 162(m). I find that, CFOs who have time-vested restricted stock and/or discretionary bonuses defer more than CFOs who do not have time-vested restricted stock and discretionary bonuses only when CFOs are covered under Section 162(m) in the pre regulatory change period. The amount of compensation deferred by CFOs is not related to whether they have time-vested restricted stock and/or discretionary bonuses when CFOs are no longer covered under Section 162(m) post the regulatory change. CEOs, who are not affected by the regulatory change, defer more when they have time-vested restricted stock and/or discretionary bonuses in both the pre and the post regulatory change period. Since firms use time-vested restricted stock for executive retention and discretionary bonuses when performance indicators are difficult to specify and/or verify for contracting purposes, my finding suggests that firms use deferred compensation to reduce the costs of retaining executives and aligning the interests of executives and shareholders.

This paper also has policy implications on the tax reform of executive compensation. Although applying Section 162(m) limitation to all equity compensation may encourage firms to decrease the amount of equity compensation, it may also have an unintended consequence of creating incentives for firms to use deferred compensation to preserve the tax deductibility of equity compensation. Consequently, total compensation of risk averse executives may increase because the value of deferred compensation is sensitive to default risk. The goal of reducing executive compensation may be achieved when restricting the tax deductibility of equity compensation together with limiting the amount of compensation allowed to defer.[18]

[18]The Senate bill 2886, Corporate Executive Compensation Accountability and Transparency Act, was introduced in the 110^{th} Congress by Sen. Hillary Clinton. Section 2 of this bill requires that the aggregate amount of compensation deferred with respect to a participant under the non-qualified deferred compensation should not exceed $1 million per year.

References

Anantharaman, D., V. W. Fang, and G. Gong (2013). Inside debt and the design of corporate debt contracts. *Management Science Forthcoming*.

Antia, M., C. Pantzalis, and J. C. Park (2010, June). CEO decision horizon and firm performance: An empirical investigation. *Journal of Corporate Finance 16*(3), 288–301.

Balsam, S. and S. Miharjo (2007, March). The effect of equity compensation on voluntary executive turnover. *Journal of Accounting and Economics 43*(1), 95–119.

Bebchuk, L. A. and J. M. Fried (2010). How to tie equity compensation to long-term results. *Journal of Applied Corporate Finance 22*(1), 99–106.

Bolton, P., H. Mehran, and J. D. Shapiro (2011). Executive compensation and risk taking. Technical report, Federal Reserve Bank of New York Staff Report No.456.

Campbell, J. Y. and G. B. Taksler (2003, December). Equity volatility and corporate bond yields. *Journal of Finance 58*(6), 2321–2350.

Carter, M. E. and L. J. Lynch (2001, August). An examination of executive stock option repricing. *Journal of Financial Economics 61*(2), 207–225.

Carter, M. E. and L. J. Lynch (2004, February). The effect of stock option repricing on employee turnover. *Journal of Accounting and Economics 37*(1), 91–112.

Cassell, C. A., S. X. Huang, and J. M. Sanchez (2013). Forecasting without consequence? evidence on the properties of retiring CEOs' forecasts of future earnings. *The Accounting Review Forthcoming*.

Cassell, C. A., S. X. Huang, J. M. Sanchez, and M. D. Stuart (2012, March). Seeking safety: The relation between CEO inside debt holdings and the riskiness of firm investment and financial policies. *Journal of Financial Economics 103*(3), 588–610.

Cen, W. (2011). The determinants of CEO inside debt and its components. *Working Paper*.

Chava, S. and A. Purnanandam (2010). Is default-risk negatively related to stock returns? *Review of Financial Studies 23*(6), 2523–2559.

Chen, F., Y. Dou, and X. Wang (2011). Executive inside debt holdings and creditors' demand for pricing and non-pricing protections. *Working Paper*.

Cleary, S. (1999, April). The relation between firm investment and financial status. *Journal of Finance 54*(2), 673–692.

Cochrane, J. H. (2007). Portfolio theory. *Manuscript University of Chicago*.

Core, J. E. and W. R. Guay (1999, December). The use of equity grants to manage optimal equity incentive levels. *Journal of Accounting and Economics 28*(2), 151–184.

Core, J. E. and D. F. Larcker (2002, June). Performance consequences of mandatory increases in executive stock ownership. *Journal of Financial Economics 64*(3), 317–340.

Dechow, P. M., A. P. Hutton, and R. G. Sloan (1996, Supplement). Economic consequences of accounting for stock-based compensation. *Journal of Accounting Research 34*(3), 1–20.

Dechow, P. M. and R. G. Sloan (1991, March). Executive incentives and the horizon problem: An empirical investigation. *Journal of Accounting and Economics 14*(1), 51–89.

Edmans, A. and Q. Liu (2011). Inside debt. *Review of Finance 15*(1), 75–102.

Erkens, D. H. (2011, September). Do firms use time-vested stock-based pay to keep research and development investments secret? *Journal of Accounting Research 49*(4), 861–894.

Fama, E. F. (1980, April). Agency problems and the theory of the firm. *Journal of Political Economy 88*(2), 288–307.

Fama, E. F. and M. C. Jensen (1983a, June). Agency problems and residual claims. *Journal of Law and Economics 26*(2), 327–349.

Fama, E. F. and M. C. Jensen (1983b, June). Separation of ownership and control. *Journal of Law and Economics 26*(2), 301–325.

Feenberg, D. R. and E. Coutts (1993). An introduction to the taxsim model. *Journal of Policy Analysis and Management 12*(1), 189–194.

Franco, F., C. D. Ittner, and O. Urcan (2013). Determinants and trading performance of equity deferral choices by corporate outside directors. *Working Paper*.

Gerakos, J. (2010). CEO pensions: Disclosure, managerial power, and optimal contracting. *University of Chicago Booth School of Business Working Paper*.

Hall, B. J. and J. B. Liebman (2000). *The Taxation of Executive Compensation*, Volume Tax Policy and the Economy. MIT Press.

Hall, B. J. and K. J. Murphy (2002, February). Stock options for undiversified executives. *Journal of Accounting and Economics 33*(1), 3–42.

Holmstrom, B. (1979, Spring). Moral hazard and observability. *Bell Jounrnal of Economics 10*, 74–91.

Holmstrom, B. and P. Milgrom (1987, March). Aggregation and linearity in the provision of intertemporal incentives. *Econometrica 55*(2), 303–328.

Holmstrom, B. and P. Milgrom (1991, Special-I). Multitask principal-agent analyses: Incentive contracts, asset ownership, and job design. *Journal of Law, Economics and Organization 7*(0), 24–52.

Jensen, M. C. and W. H. Meckling (1976, October). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics 3*(4), 305–360.

Kahl, M., J. Liu, and F. Longstaff (2003, March). Paper millionaires: How valuable is stock to a stockholder who is restricted from selling it? *Journal of Financial Economics 67*(3), 385–410.

Kalyta, P. (2009). Accounting discretion, horizon problem, and CEO retirement benefits. *The Accounting Review 84*(5), 1553–1574.

Kaplan, S. N. and L. Zingales (1997). Do financial constraints explain why investment is correlated with cash flow? *Quarterly Journal of Economics 112*(1), 169–216.

Kothari, S., S. Shu, and P. D. Wysocki (2008, March). Do managers withold bad news? *Journal of Accounting Research 47*(1), 241–276.

Lambert, R. A., D. F. Larcker, and R. E. Verrecchia (1991, Spring). Portfolio considerations in valuing executive compensation. *Journal of Accounting Research 29*(1), 129–149.

Markowitz, H. (1952, March). Portfolio selection. *Journal of Finance 7*(1), 77–91.

Merton, R. C. (1969, August). Lifetime portfolio selection under uncertainty: The continuous-time case. *The Review of Economics and Statistics 51*(3), 247–257.

Ofek, E. and D. Yermack (2000, June). Taking stock: Equity-base compensation and the evolution of managerial ownership. *Journal of Finance 55*(3), 1367–1384.

Oyer, P. (2004, August). Why do firms use incentives that have no incentive effects? *Journal of Finance 59*(4), 1619–1650.

Oyer, P. and S. Schaefer (2005, April). Why do some firms give stock options to all employees? an empirical examination of alternative theories. *Journal of Financial Economics 76*(1), 99–133.

Perry, T. and M. Zenner (2001, December). Pay for performance? Government regulation and the structure of compensation contracts. *Journal of Financial Economics 62*(3), 453–488.

Rajan, M. V. and S. Reichelstein (2006, June). Subjective performance indicators and discretionary bonus pools. *Journal of Accounting Research 44*(3), 585–618.

Rose, N. L. and C. Wolfram (2002). Regulating executive pay: Using the tax code to influence chief executive officer compensation. *Journal of Labor Economics 20*(2).

Ross, S. A. (2004, February). Compensation, incentives, and the duality of risk aversion and riskiness. *Journal of Finance 59*(1), 207–225.

Scholes, M. S., M. A. Wolfson, M. Erickson, E. L. Maydew, and T. Shevlin (2002). *Taxes and Business Strategy: A Planning Approach*. Prentice Hall.

Sharpe, W. F. (1964, September). Capital asset prices: A theory of market equilibrium under conditions of risk. *Journal of Finance 19*(3), 425–442.

Shumway, T. (2001, January). Forecasting bankruptcy more acurately: A simple hazard model. *Journal of Business 74*(1), 101–124.

Smith, C. W. and R. L. Watts (1982). Incentive and tax effects of executive compensation plans. *Australian Journal of Management 7*, 139–157.

Smith, C. W. and R. L. Watts (1992, December). The investment opportunity set and corporate financing, dividend, and compensation policies. *Journal of Financial Economics 32*(3), 263–292.

Sundaram, R. K. and D. L. Yermack (2007, August). Pay me later: Inside debt and its role in managerial compensation. *Journal of Finance 62*(4), 1551–1588.

Wang, C., F. Xie, and X. Xin (2010). Managerial ownership of debt and bank loan contracting. *Working Paper*.

Whited, T. M. and G. Wu (2006, February). Financial constraints risk. *Review of Financial Studies 19*(2), 531–559.

Appendix I: Variable Definition

Executive Level:

162m$_{i,t}$ = an indicator variable equal to 1 if an executive i in year t has time-vested restricted stock and/or discretionary bonuses, and 0 otherwise.

162ms$_{i,t}$ = an indicator variable equal to 1 if an executive i in year t has more than a $1 million salary or has time-vested restricted stock and/or discretionary bonuses, and 0 otherwise.

Cash$_{i,t}$ = $salary_{i,t}$ + $bonus_{i,t}$ + $non\ equity\ cash\ incentives_{i,t}$.

Contrib_Exec$_{i,t}$ = the amount of compensation deferred by executive i in year t.

Equity$_{i,t}$ = executive $i's$ stock compensation vested in year t.

Retire$_{i}$ = an indicator variable equal to 1 if an executive i retired from the firm during 2006-2012 and does not take a non-director position in another firm, and 0 otherwise. This variable is not a function of t.

Resign$_{i}$ = an indicator variable equal to 1 if an executive i resigned from the firm during 2006-2012. This variable is not a function of t.

State Tax$_{i,t}$ = Maximum tax rate for wage in year t faced by executive i in the state where her firm is headquartered multiplied by 100, following Feenberg and Coutts (1993), See http://www.nber.org/ taxsim/state-rates/.

Tax ID$_{i,t}$ = an indicator variable equal to 1 if the income tax of the state executive i works in year t is positive, and 0 otherwise.

Total$_{i,t}$ = $Cash_{i,t}$ + $Equity_{i,t}$.

Firm Level:

Bankrupt$_{j,t}$ = 1-1/(1+exp(-13.303 - 1.982*($Net\ Income_{j,t}$/$Total\ Assets_{j,t}$) + 3.593*($Total\ Liabilities_{j,t}$/$Total\ Assets_{j,t}$) - 0.467*($Market\ Cap_{j,t}$/Market Cap of

AMEX&NYSE) - 1.809*($Excess\ Return_{j,t}$) + 5.791*$Idiosyncratic\ Risk_{j,t}$)), following Shumway (2001).

Cash Flow$_{j,t}$ = operating cash flow of firm j in year t divided by total assets of firm j in year $t-1$.

DIV_Change$_{j,t}$ = $[Div(j,t) - Div(j,t-1)]/Div(j,t-1)$. $Div_{j,t}$ is the cash dividend of firm j in year t.

Large_Cash$_{j,t}$ = an indicator variable equal to 1 if both the CEO and the CFO in firm j defer 20% cash compensation in year t, and 0 otherwise.

Leverage$_{j,t}$ = debt/market value of equity (or total assets) of firm j in year t following Sundaram and Yermack (2007).

Match$_{j,t}$ = an indicator variable equal to 1 if material terms collected from annual proxy statements suggest that firm j in year t provides matching contribution to deferred compensation, and 0 otherwise.

MTB$_{j,t}$ = market value of equity/book value of assets of firm j in year t.

Stock Return$_{j,t}$ = annual compounded stock return of firm j in year t.

Volatility$_{j,t}$ = the standard deviation of the residual of the market model regression using previous 36-month returns of firm j in year t

Appendix II: Data Collection Process

I download annual proxy statements of my sample firms from 2006 to 2012 and read the non-qualified deferred compensation table and material terms of the deferred compensation plan in each proxy statement. In particular, I first read the material terms and collect various data such as, the rate of matching contributions, the maximum percentage of eligible income that the firm matches, the types of compensation that executives are allowed to defer, e.g. salary, cash incentive, and restricted stock (units), and the minimum number of years the deferred compensation has to remain in the account.

Then, I read the footnote of each non-qualified deferred compensation table to check if the number in each item of the table represents what it is supposed to represent. In particular, some firms include executives' deferrals of restricted stock (units) in firms' contributions, I manually deduct the amounts of deferrals from firms' contributions and add them back to executives' contributions; some firms include executives' deferrals of sign on bonus in firms' contributions, I manually deduct them from firms' contributions and add them back to executives' contributions. This process changes the amounts of executives' and firms' contributions for about 5% of the total observations.

Some firms do not allow their executives to defer their compensation but still maintain the plan by either making discretionary contributions or accruing investment income for executives' balances in the plan. These firms are covered by deferredcomp dataset of ExecuComp Database and their executives' deferrals are 0 in the year that executives are not allowed to defer. I delete these executive-year observations as 0 deferrals in these cases do not suggest executives choose not to defer.

Appendix III: Optimal Compensation Deferral

Section 5 of Cochrane (2007) details the derivation of the Merton continuous time portfolio choice model with outside income. An executive wants to maximize lifetime utility over consumption:

$$maxE\int_0^\infty e^{-\rho t}u(c_t)dt$$
$$dR_t = \mu(y_t)dt + \sigma(y_t)dz_t$$
$$dy_t = \mu_y(y_t)dt + \sigma_y(y_t)dz_t$$

$$dW = W\alpha dR + W(1-\alpha)rdt + (e-c)dt$$

where e is outside wealth, which is a function of the state variable y. The value function can be written as

$$V(W,y,t) = \max_{\{c,\alpha\}} u(c)dt + E_t[e^{-\rho dt}V(W_{t+dt}, y_{t+dt}, t+dt)]$$

Applying Ito's lemma to the value function

$$0 = \max_{\{c,\alpha\}} u(c)dt + \rho V dt + V_t dt + V_W E_t(dW) + V_y E_t(dy) + \frac{1}{2}V_{WW}dW^2 + \frac{1}{2}V_{yy}dy^2 + V_{Wy}dWdy$$

Taking first order conditions after substituting for dW and dy

$$\frac{\partial}{\partial\alpha} : WV_W(\mu - r) + W^2V_{WW}\sigma^2\alpha + W\sigma\sigma_y V_{Wy}$$
$$\alpha = -\frac{V_W}{WV_{WW}}\frac{\mu - r}{\sigma^2} - \frac{\sigma_y}{\sigma}\frac{V_{Wy}}{WV_{WW}}$$

Then, the optimal amount of deferrals can be represented as

$$W\alpha = \frac{1}{\gamma}\frac{\mu_t - r_t}{\sigma_t^2} + \frac{\eta}{\gamma}\beta_{dy,dR}$$

where

$$\gamma = -\frac{V_{WW}}{V_W}; \eta = \frac{V_{Wy}}{V_W}; \beta_{dy,dR} = \frac{\sigma\sigma_y}{\sigma^2}$$

Figure 1: Timeline of deferral elections and tax deductions of Salary

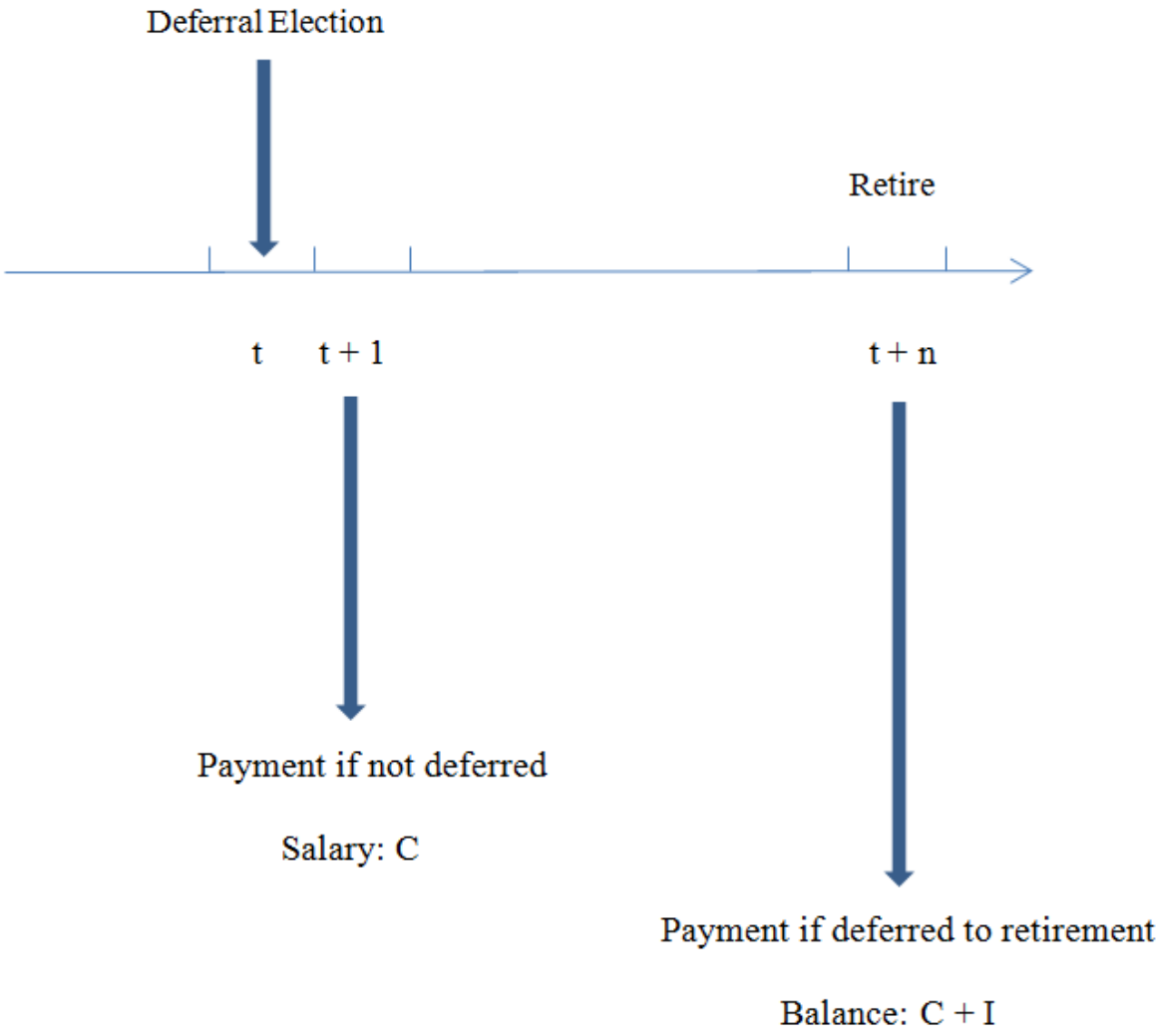


Figure 2: Timeline of deferral elections and tax deductions of RSU

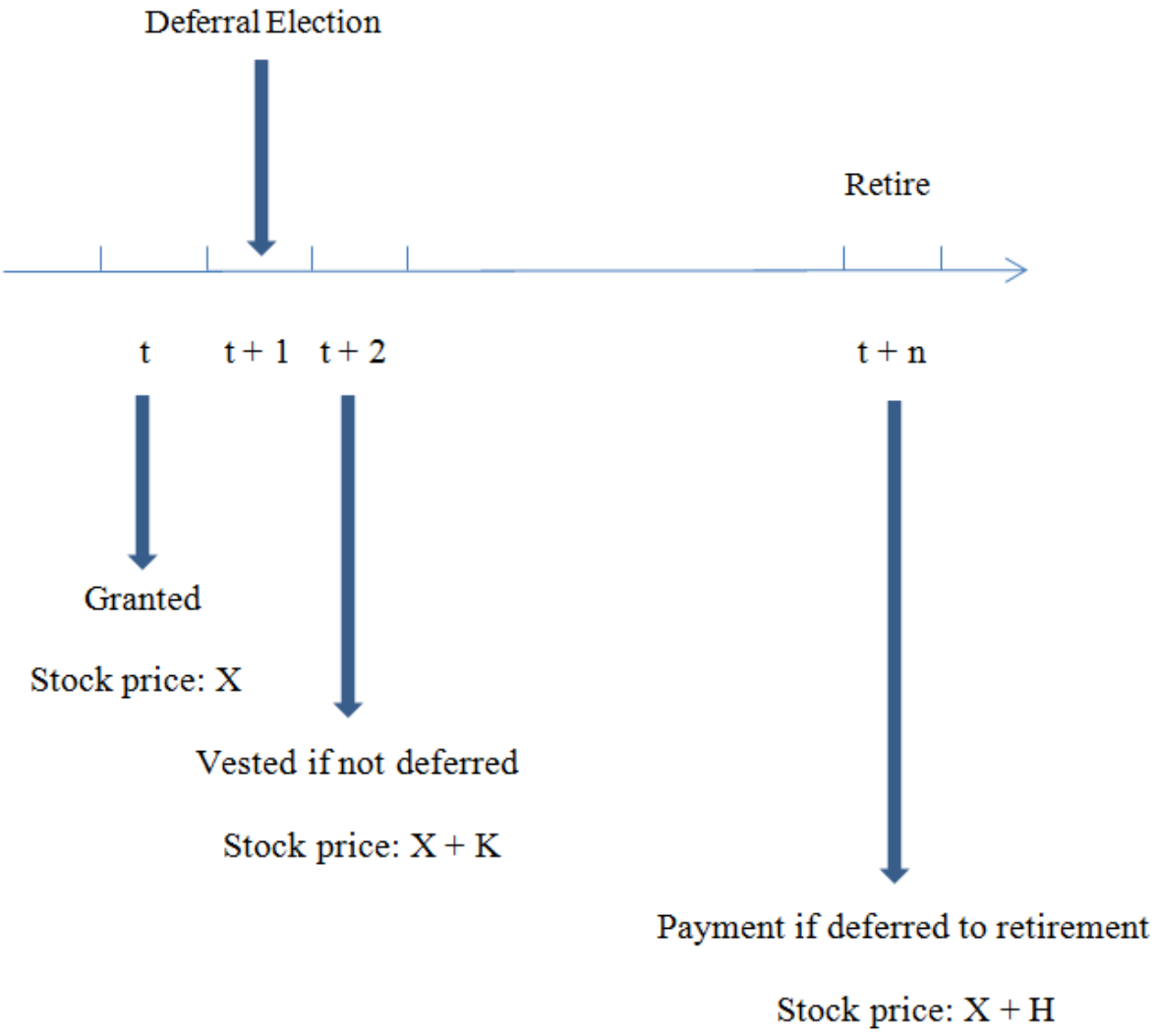


Figure 3: Time Trend of Compensation Deferrals

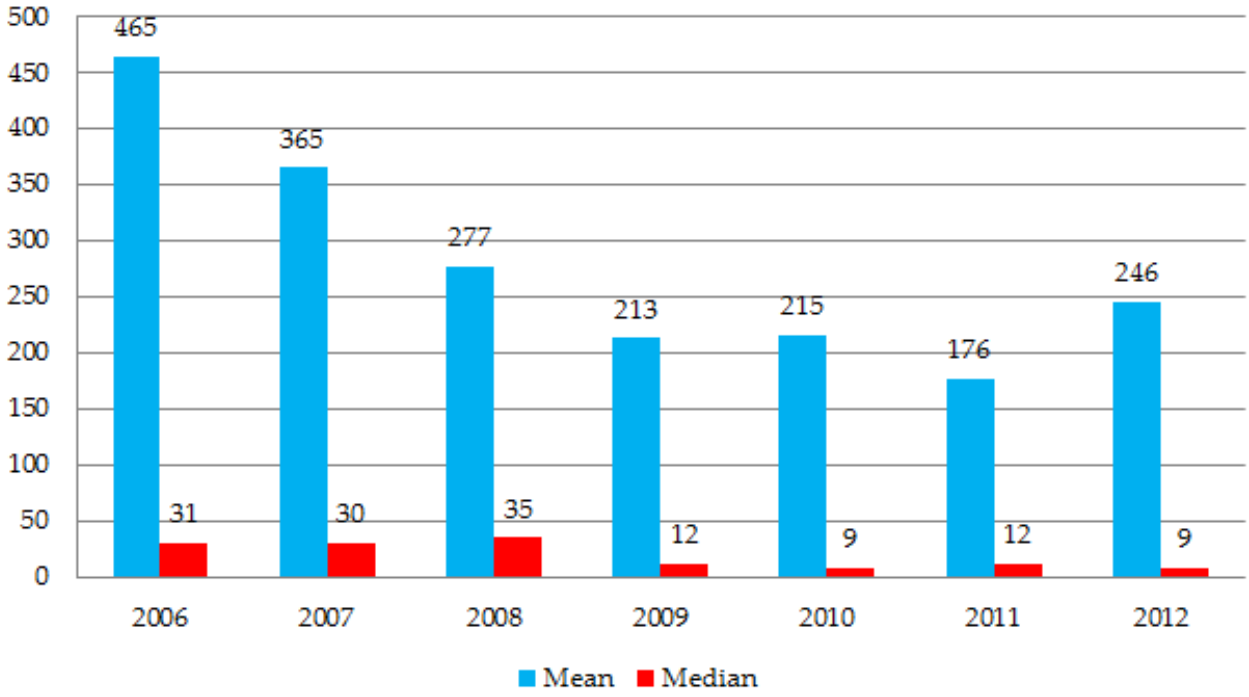


Figure 4: Amount of Deferrals by *162m* and *Retire*

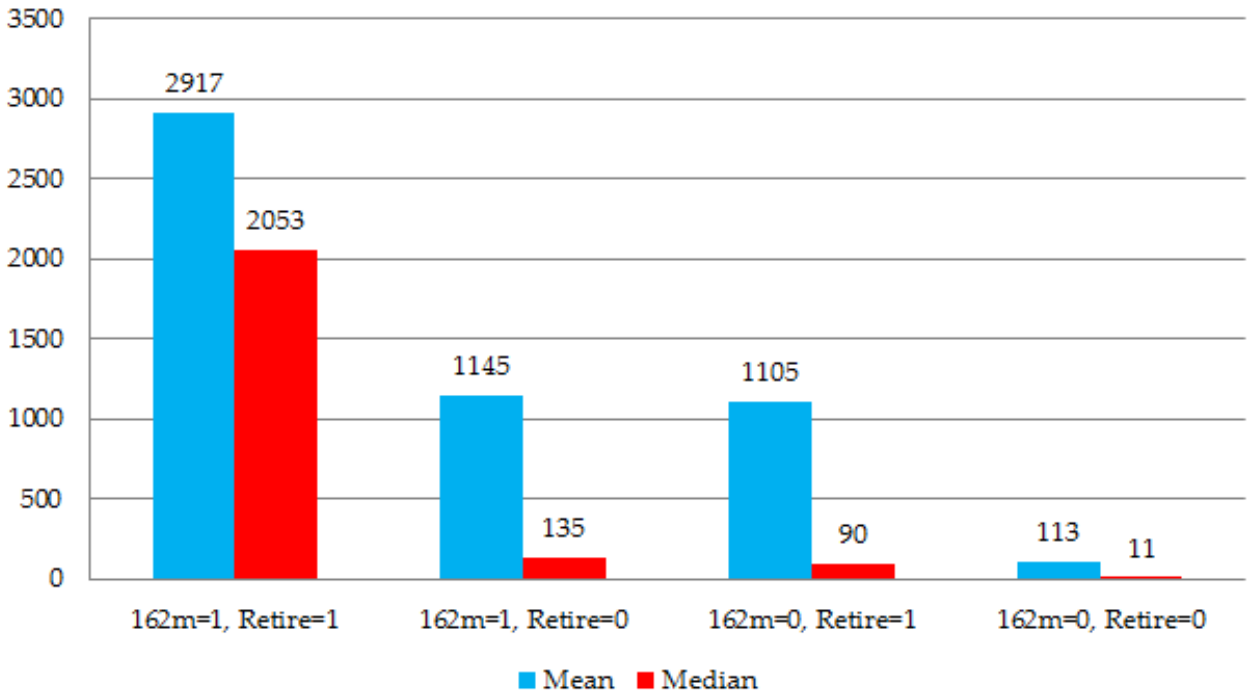
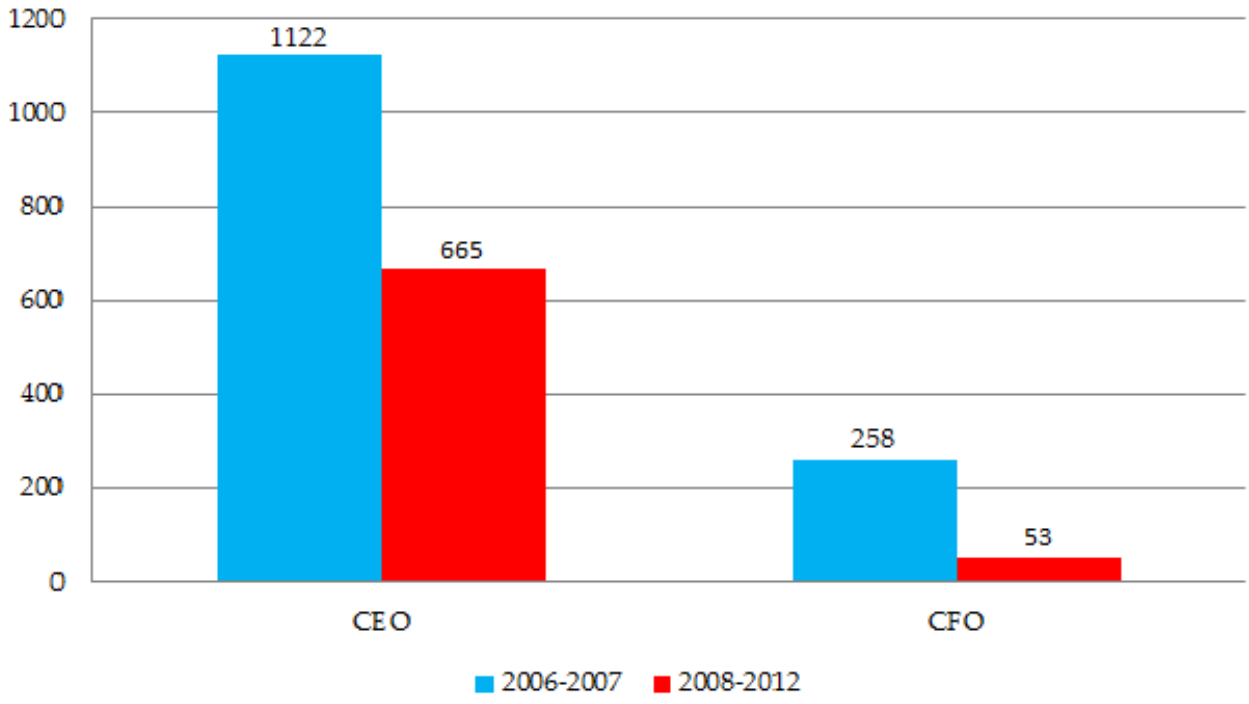


Figure 5: Median Deferrals pre and post the Regulatory Change

(a) *162m* = 1



(b) *162m* = 0

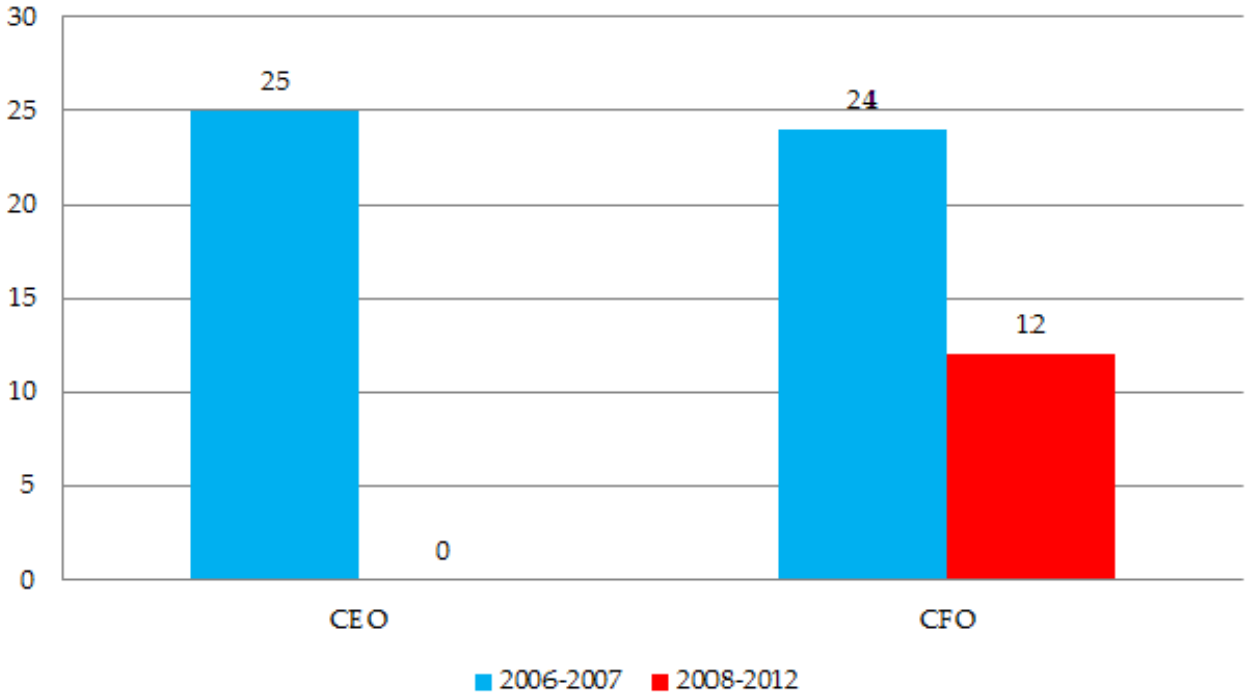


Table 1: Plan Description

Term	Yes	No
Salary	348	28
Bonus and Nonequity Incentive	346	30
Equity	63	313
Bond	186	190
Phantom Stock	156	220
Mutual	307	69
Matching Contribution	197	179
Discretionary Contribution	81	295
Distribution Before Termination or Retirement	199	177

Table 1 describes the material terms of the non-qualified deferred compensation plans of my sample. The first three rows present the types of compensation that non-qualified deferred compensation plans allow executives to defer. The second three rows report the types of investment vehicles that non-qualified deferred compensation plans allow executives to defer to. The last three rows describe how many firms provide matching contributions, discretionary contributions, and allow distribution before termination or retirement.

Table 2: Descriptive Statistics

Variable	N	Mean	STD	25%	Median	75%
Contribtion_Exec	4438	268.802	1490.96	0	21.9280	116.100
Contrib_Exec/Total Comp	4438	0.0667	0.1492	0	0.0118	0.0579
Salary	4438	735.964	370.580	452.923	652.308	975.000
Bonus	4438	173.559	1420.61	0	0	0
Non-Equity Incentive	4438	1072.66	1633.11	133.461	557.316	1365.41
Stock(Vesting)	4438	1601.57	3872.16	0	344.38	1458.53
162m	4438	0.0899	0.2861	0	0	0
162ms	4438	0.2603	0.4388	0	0	1
Matching	4438	0.5575	0.4967	0	1	1
Retire	4438	0.0768	0.2664	0	0	0
Resign	4438	0.1519	0.3589	0	0	0
State Tax	4438	5.79%	3.09%	4.35%	6.00%	7.85%
Return	4438	0.1328	0.5947	-0.1291	0.0935	0.3048
Volatility	4438	0.0872	0.0471	0.0568	0.764	0.1036
Market to Book	4438	2.7697	2.5340	1.4210	2.1936	3.3605
Leverage	4438	0.2296	0.0984	0.0907	0.1811	0.3178
Bankrupt	4438	0.2897	0.1941	0.1546	0.2366	0.3627
Cash Flow	4438	0.1098	0.0641	0.0683	0.1076	0.1463
DIV_Change	2864	0.2023	1.2693	0.0088	0.0736	0.1729

Table 3: Correlation Matrix

	Contribution_Exec	162m	Retire	State Tax	Pension	Total	Match	Return	Volatility	MTB	Leverage	Bankrupt
Contribtion_Exec	1	**0.25**	**0.21**	**0.08**	0.01	**0.35**	-0.01	0.00	**-0.11**	0.00	**-0.06**	**-0.07**
162m		1	**0.15**	**0.03**	**0.12**	**0.12**	**0.05**	-0.01	**-0.10**	0.01	-0.03	**-0.06**
Retire			1	-0.00	**0.13**	**0.12**	0.01	-0.01	**-0.13**	0.01	**-0.03**	**-0.04**
State Tax				1	-0.02	**0.05**	0.00	0.01	**-0.10**	0.02	**-0.17**	**-0.10**
Pension					1	**0.15**	**0.05**	0.00	**-0.23**	0.03	**0.06**	0.01
Total						1	**0.03**	**0.04**	**-0.15**	0.01	**-0.05**	**-0.08**
Match							1	0.00	-0.01	**-0.04**	0.01	-0.01
Return								1	**0.12**	-0.01	**-0.08**	**-0.36**
Volatility									1	**-0.07**	**0.31**	**0.42**
MTB										1	-0.02	-0.02
Leverage											1	**0.69**
Bankrupt												1

Table 4: Test of 162m and Retirement Hypotheses

Variable	Expected Sign	Dept Variable: Contrib_Exec		Dept Variable: log(1+ Contrib_Exec)		Dept Variable: Contrib_Exec/Total	
		Coef	*p-value*	*Coef*	*p-value*	*Coef*	*p-value*
162m	+	1088.80	0.0063	1.8834	0.0001	0.0969	0.0001
Retire	+	872.984	0.0095	1.4297	0.0001	0.0868	0.0007
Total	+	93.0028	0.0538			0.0000	0.4109
log(Total)	+			0.1989	0.0001		
State Tax	+	26.7734	0.0019	0.0690	0.0113	0.0020	0.0222
Match		-76.8604	0.3962	1.3307	0.0001	0.0017	0.7653
Stock Return	+/0	40.0999	0.2497	-0.1046	0.0460	0.0007	0.7269
Size	+/0	0.0024	0.2703	0.0000	0.7796	0.0000	0.1150
Market to Book	+/0	-1.3447	0.2980	0.0032	0.1481	-0.0000	0.5221
Leverage	+/-/0	-7.2402	0.9456	-0.4639	0.2686	-0.0043	0.7153
Volatility	+/-/0	-272.984	0.7634	-4.2342	0.0171	-0.1381	0.0046
NOL	+/-/0	-86.6518	0.2486	0.0259	0.8628	-0.0066	0.2075
Year Dummy		*Yes*		*Yes*		*Yes*	
CEO&CFO Dummy		*Yes*		*Yes*		*Yes*	
N		4438		4438		4438	
Pseudo R^2		0.1993		0.2337		0.1309	

Table 4 provides regression results of testing *162m* and *Retirement* hypotheses. Dependent variables are the amount of compensation deferred, *Contrib_Exec*, the logarithm of the amount of compensation deferred plus 1, log(1+*Contrib_Exec*), and the ratio of the amount of compensation deferred to total compensation, *Contrib_Exec/Total*, respectively. 162*m* is equal to 1 if an executive has time-vested restricted stock and/or discretionary bonuses, and 0 otherwise, *Retire* is equal to 1 if executive retired during the sample period, and 0 otherwise, *Total* is total compensation, *State Tax* is state income tax multiplied by 100, *Match* is equal to 1 if the firm provides matching contributions, and 0 otherwise, *stock return*, *MTB*, *leverage*, *Volatility*, and *NOL* are defined in the appendix. I also include year dummy and CEO&CFO dummy. All standard errors are clustered by executives.

Table 5: Test of 162m and Retirement Hypotheses: An Alternative Proxy of 162m Deductibility

Variable	Expected Sign	Dept Variable: Contrib_Exec		Dept Variable: log(1+ Contrib_Exec)		Dept Variable: Contrib_Exec/Total	
		Coef	*p-value*	*Coef*	*p-value*	*Coef*	*p-value*
162ms	+	34.6740	0.8719	0.5520	0.0159	0.0205	0.0259
Retire	+	1015.12	0.0038	1.5864	0.0001	0.0959	0.0003
Total	+	0.0987	0.0817			0.0000	0.6529
log(Total)	+			0.1812	0.0001		
State Tax	+	29.3727	0.0025	0.0713	0.0107	0.0021	0.0227
Match		-44.7149	0.5969	1.3700	0.0001	0.0039	0.5087
Stock Return	+/0	43.2743	0.2423	-0.1013	0.0543	0.0009	0.6664
Size	+/0	0.0030	0.1462	0.0000	0.4674	0.0000	0.600
Market to Book	+/0	-1.2615	0.2948	0.0030	0.2211	-0.0000	0.5115
Leverage	+/-/0	-21.7597	0.8412	-0.5160	0.2285	-0.0071	0.5561
Volatility	+/-/0	-477.469	0.5204	-4.1504	0.0208	-0.1356	0.0054
NOL	-	-144.872	0.1947	0.0041	0.9787	-0.0081	0.1464
Year Dummy		*Yes*		*Yes*		*Yes*	
CEO&CFO Dummy		*Yes*		*Yes*		*Yes*	
N		4438		4438		4438	
Pseudo R^2		0.1686		0.2067		0.0867	

Table 5 provides regression results of testing *162m* and *Retirement* hypotheses, using an alternative proxy for 162m deductibility. Dependent variables are the amount of compensation deferred, *Contrib_Exec*, the logarithm of the amount of compensation deferred plus 1, log(1+*Contrib_Exec*), and the ratio of the amount of compensation deferred to total compensation, *Contrib_Exec/Total*, respectively. $162m$ is equal to 1 if an executive has more than a $1 million salary or has time-vested restricted stock and/or discretionary bonuses, and 0 otherwise, *Retire* is equal to 1 if executive retired during the sample period, and 0 otherwise, $Total$ is total compensation, *State Tax* is state income tax multiplied by 100, $Match$ is equal to 1 if the firm provides matching contributions, and 0 otherwise, *stock return*, MTB, *leverage*, $Volatility$, and NOL are defined in the appendix. I also include year dummy and CEO&CFO dummy. All standard errors are clustered by executives.

Table 6: Test of Liquidity Constraint Hypothesis

Variable	Expected Sign	Dept Variable: Large_Cash		Dept Variable: Large_Cash		Marginal Effect
		Coef	*p-value*	*Coef*	*p-value*	
Cash Flow	-	-4.0539	0.0354			-1.0127
DIV_Change	-			0.2314	0.0079	-0.0550
162m	+	1.0732	0.0362	1.1527	0.0248	0.2681
Retire	+	1.0455	0.0108	1.0425	0.0176	0.2612
State Tax	+	0.1037	0.0201	0.1177	0.0595	0.0259
Match		0.0047	0.9882	-0.2793	0.4686	0.0012
Stock Return	+/0	-0.1035	0.7038	0.2660	0.4142	-0.0259
Market to Book	+/0	-0.0099	0.2664	-0.0180	0.0635	-0.0025
Leverage	+/-/0	-2.0940	0.0216	-1.2558	0.2310	-0.5231
Volatility	+/-/0	-16.6377	0.0001	-13.5197	0.0143	-4.1563
Year Dummy		*Yes*		*Yes*		
N		3724		2291		
Pseudo R^2		0.031		0.0399		

Table 6 provides logistic regression results for the incidence of large proportion of cash and stock compensation deferred by both the CEO and the CFO. Dependent variable is $Large\_Cash_{i,t}$, an indicator variable equal to 1 if both the CEO and the CFO in firm i defer 20% cash (stock) compensation in year t, and 0 otherwise. *Cash Flow* is operating cash flow divided by total assets, DIV_Change is equal to $[Div(t) - Div(t-1)]/Div(t-1)$, $162m$ is equal to 1 if observation has time-vested restricted stock and/or discretionary bonuses, and 0 otherwise, *Retire* is equal to 1 if executive retired during the sample period, and 0 otherwise, *State Tax* is state income tax multiplied by 100, $Match$ is equal to 1 if the firm provides matching contributions, and 0 otherwise, *stock return*, MTB, *leverage*, $Volatility$, and *Bankrupt* are defined in the appendix. All standard errors are clustered by firms and executives.

Table 7: Test of 162m Hypothesis: CEO versus CFO

Variable	Expected Sign	Dept Variable: Contrib_Exec: CEO		Dept Variable: Contrib_Exec: CFO		Dept Variable: Contrib_Exec: All	
		Coef	*p-value*	*Coef*	*p-value*	*Coef*	*p-value*
162m	+	1560.09	0.0073	280.992	0.1052	311.222	0.1486
CEO						-215.9139	0.1319
162m*CEO	+					1284.00	0.0388
Retire	+	1023.92	0.0465	337.723	0.2909	826.102	0.0257
Total	+	87.0298	0.0603	168.721	0.0287	92.1448	0.0359
State Tax	+	43.8934	0.0173	19.2531	0.0060	32.2432	0.0013
Match		-108.351	0.4935	-53.9742	0.3967	-80.8830	0.3515
Stock Return	+/0	-43.2820	0.2510	-0.1608	0.9851	-14.8376	0.4161
Size		0.0040	0.3602	0.0012	0.3005	0.0025	0.1878
Market to Book	+/0	-2.9345	0.3232	-1.4547	0.3123	-2.0480	0.1942
Leverage	+/-/0	-94.7275	0.5821	-96.1734	0.1462	-89.8721	0.3220
Volatility	-/0	-241.637	0.8539	651.1007	0.3457	-92.6748	0.9074
NOL		26.2934	0.7657	-1.9905	0.9632	6.0089	0.9022
Year Dummy		*Yes*		*Yes*		*Yes*	
N		2243		2195		4438	
Pseudo R^2		0.2069		0.2479		0.2092	

Table 7 provides Tobit regression results for the amount of compensation deferred for CEOs and CFOs, respectively. Dependent variable is the amount of compensation deferred, *Contrib_Exec*. $162m$ is equal to 1 if observation has time-vested restricted stock and/or discretionary bonuses, and 0 otherwise, *Retire* is equal to 1 if executive retired during the sample period, and 0 otherwise, *Total* is total compensation, *State Tax* is state income tax multiplied by 100, *Match* is equal to 1 if the firm provides matching contributions, and 0 otherwise, *stock return*, *MTB*, *leverage*, *Volatility*, and *Bankrupt* are defined in the appendix. All standard errors are clustered by executives.

Table 8: Test of 162m Hypothesis: CFO 2006-2007 versus 2008-2012

Variable	Expected Sign	Dept Variable: Contrib_Exec: 2006-2007		Dept Variable: Contrib_Exec: 2008-2012	
		Coef	*p-value*	*Coef*	*p-value*
162m	+/0	818.925	0.0185	57.6141	0.4849
Retire	+	-268.6992	0.4301	725.378	0.1512
Total	+	383.637	0.0455	96.4755	0.0353
State Tax	+	40.1489	0.0234	12.2733	0.0044
Match		-95.1051	0.3440	-17.5254	0.7470
Stock Return	+/0	-14.8854	0.8521	-6.0013	0.3420
Size		-0.0017	0.1205	0.0022	0.0636
Market to Book	+/0	-10.3620	0.1614	-0.7262	0.3310
Leverage	+/-/0	-290.269	0.2238	-70.8666	0.1615
Volatility	-/0	2538.67	0.2383	131.000	0.7478
NOL		50.2148	0.4745	19.0865	0.6902
Year Dummy		*Yes*		*Yes*	
N		535		1660	
Pseudo R^2		0.4862		0.2294	

Table 8 provides Tobit regression results for the amount of compensation deferred for CFOs in 2006-2007 and 2008-2012. Dependent variable is the amount of compensation deferred, *Contrib_Exec*. 162*m* is equal to 1 if observation has time-vested restricted stock and/or discretionary bonuses, and 0 otherwise, *Retire* is equal to 1 if executive retired during the sample period, and 0 otherwise, *Total* is total compensation, *State Tax* is state income tax multiplied by 100, *Match* is equal to 1 if the firm provides matching contributions, and 0 otherwise, *stock return*, *MTB*, *leverage*, *Volatility*, and *Bankrupt* are defined in the appendix. All standard errors are clustered by executives.

Table 9: Test of Retirement Hypothesis: The Effect of State Tax

Variable	Expected Sign	Dept Variable: Contrib_Exec($Tax > 0$)		Dept Variable: Contrib_Exec($Tax = 0$)		Dept Variable: Contrib_Exec(All)	
		Coef	*p-value*	*Coef*	*p-value*	*Coef*	*p-value*
162m	+	1037.24	0.0027	406.201	0.0933	952.546	0.0015
Retire	+/0	1059.31	0.0122	15.0180	0.8753	-69.4156	0.6757
State Tax	+	45.5738	0.0220				
Tax ID	+					-242.272	0.0509
Retirement*Tax ID	+					1156.69	0.0063
Total	+	97.4503	0.0432	29.9236	0.1683	93.5743	0.0383
Match		-91.5532	0.3728	-88.7197	0.0834	-92.5794	0.2972
Stock Return	+/0	-11.2198	0.5784	-35.4892	0.4831	-18.338	0.3220
Size		0.0024	0.2323	0.0005	0.4841	0.0022	0.2266
Market to Book	+/0	-2.3122	0.2082	-1.1958	0.3414	-2.1844	0.1940
Leverage	+/-/0	-74.9448	0.4395	-41.3701	0.6003	-77.3505	0.3574
Volatility	-/0	143.927	0.8830	-126.541	0.5785	30.2532	0.9701
NOL		-0.1040	0.9986	0.9075	0.9735	9.5385	0.8490
Year Dummy		*Yes*		*Yes*		*Yes*	
CEO&CFO Dummy		*Yes*		*Yes*		*Yes*	
N		3827		611		4438	
Pseudo R^2		0.2054		0.1893		0.2019	

Table 9 provides Tobit regression results for the amount of compensation deferred for executives in zero income tax states and positive income tax states. Dependent variable is the amount of compensation deferred, *Contrib_Exec*. $162m$ is equal to 1 if observation has time-vested restricted stock and/or discretionary bonuses, and 0 otherwise, *Retire* is equal to 1 if executive retired during the sample period, and 0 otherwise, *Total* is total compensation, *State Tax* is state income tax multiplied by 100, *Match* is equal to 1 if the firm provides matching contributions, and 0 otherwise, *stock return*, MTB, *leverage*, $Volatility$, and *Bankrupt* are defined in the appendix. I also include year dummy and CEO&CFO dummy. All standard errors are clustered by executives.

Table 10: Test of Retirement Hypothesis: Subsample Analysis

Variable	Expected Sign	Dept Variable: Contrib_Exec (No Resign)		Dept Variable: Contrib_Exec (Early Dist)	
		Coef	*p-value*	*Coef*	*p-value*
162m	+	1084.15	0.0009	783.096	0.0211
Retire	+	893.065	0.0148	1171.48	0.0008
Total	+	116.371	0.0331	50.2914	0.0647
State Tax	+	35.0459	0.0009	24.9463	0.0332
Match		-92.6203	0.3415	-62.4240	0.5128
Stock Return	+/0	-30.8360	0.1133	-30.9367	0.1105
Market to Book	+/0	-2.1842	0.2241	-0.7934	0.3257
Leverage	+/-/0	-14.3380	0.8896	104.887	0.3944
Volatility	-/0	-593.096	0.5023	-1829.96	0.0227
Year Dummy		*Yes*		*Yes*	
CEO&CFO Dummy		*Yes*		*Yes*	
N		3764		2374	
Pseudo R^2		0.2240		0.2248	

Table 10 provides Tobit regression results for the amount of compensation deferred for excluding *Resign* sample and for *early distribution* sample, respectively. Dependent variable is the amount of compensation deferred $Contrib\_Exec$. $162m$ is equal to 1 if observation has time-vested restricted stock and/or discretionary bonuses, and 0 otherwise, *Retire* is equal to 1 if executive retired during the sample period, and 0 otherwise, $Total$ is the sum of cash and equity compensation, *State Tax* is state income tax multiplied by 100, $Match$ is equal to 1 if the firm provides matching contributions, and 0 otherwise, *stock return*, MTB, *leverage*, $Volatility$, and *Bankrupt* are defined in the appendix. I also include year dummy and CEO&CFO dummy. All standard errors are clustered by executives.