Regulating Executive Pay: Using the Tax Code to Influence Chief Executive Officer Compensation

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This study explores corporate responses to 1993 legislation that capped the corporate tax deductibility of top management compensation not qualified as "performance-based." Our analysis suggests that the cap may have created a focal point for salary compensation but had little effect on total compensation levels or growth rates at firms likely to be affected by the limit. There is little evidence that the policy significantly increased the performance sensitivity of chief executive officer (CEO) pay at affected firms. We conclude that corporate pay decisions have been relatively insulated from this policy intervention.

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In 1993, popular sentiment against "excessive" executive pay packages in the United States found expression in legislation to limit the corporate tax deductibility of executive compensation.[1] Provisions in the Omnibus Budget Reconciliation Act of 1993 (OBRA 1993), implemented as section 162(m) of the Internal Revenue Code, eliminated deductibility for executive compensation in excess of $1 million unless it qualified as "performance-based" pay. While proponents argued that this would constrain compensation packages by raising their cost to shareholders, its real effect is open to question. Our analysis of section 162(m) serves two broad purposes. First, we provide a detailed description of both the potential and the real effects of the policy changes of the early 1990s. Academic research on executive compensation increased dramatically through the 1990s (see Murphy 2000). It is important to understand how these policy changes may influence empirical analyses. Second, by analyzing the effects of the tax cap, we consider the ability of corporations to make autonomous internal decisions in the face of public opprobrium and political intervention.

Previous academic work has noted the possible sensitivity of chief executive officer (CEO) compensation levels to political constraints (see Jensen and Murphy 1990). To date, most direct empirical evidence of political constraints on executive pay has come from studies of regulated industries.[2] While these suggest that political constraints may limit executive compensation in the regulated sector, unregulated companies have historically had fewer channels through which general public sentiment against high CEO pay could be expressed and ultimately influence compensation.[3] Section 162(m) may have altered this, directly affecting compensation by increasing the after-tax cost of CEO pay to the corporation or indirectly affecting pay by inducing firms to change their compensation-setting processes. The analysis in this article adds to an emerging

[1] Attacks on executive pay had been launched from a broad cross section of society, ranging from former compensation consultants (Crystal 1991) and university presidents (Bok 1993) to institutional investors such as the California Public Employees' Retirement System (CalPERS) and politicians of both major parties.

[2] For example, Joskow, Rose, and Shepard (1993) compare compensation at regulated and unregulated companies. Joskow, Rose, and Wolfram (1996), Geddes (1997), and Wolfram (1998) analyze the electric utility industry, and Barro and Barro (1990) and Hubbard and Palia (1995) study the banking sector.

[3] Individual shareholders may influence compensation through threatened resolutions or lawsuits; large stakeholders, including institutional investors, may directly pressure the board; and media reports on the firm may indirectly influence the process (see Johnson, Porter, and Shackell 1997). By contrast, a company that is subject to a cost-plus regulatory scheme may be "punished" for paying its CEO "too much" in several additional ways. For example, a regulator may exclude all or part of executive compensation from recoverable costs or use a low-end estimate of capital costs to calculate allowable rates of return.

literature that attempts to understand how disclosure requirements and tax treatment of compensation influence executive pay, if at all.[4]

In Section I of this article, we detail the provisions of section 162(m) and describe their possible impact on executive pay. In Section II, we discuss approaches to modeling the effect of section 162(m) and how our choices differ from those made in other analyses of this policy (Hall and Liebman 2000; Perry and Zenner 2001). Our empirical analysis and results are presented in Section III, and Section IV concludes.

I. Limits on the Corporate Tax Deductibility of CEO Pay

While numerous proposals to limit top executive pay were floated during the 1980s and early 1990s, the issue achieved political viability during the 1992 presidential campaign. From the early stages of his campaign, Bill Clinton attacked "overpaid" corporate executives. This issue became more salient following President George Bush's December 1991 visit to Japan, during which Japanese politicians responded to American demands for more open markets by assigning blame for poor U.S. export performance to the "overpaid CEOs" who were traveling with Bush (Birnbaum 1992). As the campaign evolved, Clinton articulated his plan to limit the corporate tax deductibility of "excessive" pay, designating pay above $1 million as clearly excessive (Selwan 1992). Although there was considerable uncertainty over the scope of his plan, a $1 million limit would fall mainly on top executives of big corporations and Wall Street professionals. Early speculation suggested the plan would allow some kind of exemption (Bennett 1992), and Clinton frequently expressed the view that pay needed to be tied to performance. Nonetheless, in the early days of the Clinton administration, when reports of his intention to exempt all "performance-based pay" from the deductibility cap were floated, some perceived him to be backpedaling (Lublin 1993). The administration submitted its specific proposal to Congress in the beginning of April, and the provisions, largely unchanged, were included in OBRA 1993 when it was signed on August 10, 1993.

The executive compensation provisions of this act were codified in section 162(m) of the Internal Revenue Code (IRS par. 9001B, sec. 1.162). The regulations limit the corporate tax deduction for compensation paid to the CEO and each of the next four highest-paid executive officers to $1 million each, effective for compensation paid in tax years beginning on or after January 1, 1994. This cap falls at roughly the median level of

[4] See, e.g., Lewellen, Park, and Ro (1995), Murphy (1995, 1996), Johnson et al. (1997), Klassen and Mawani (2000), Baker (1999), Prevost and Wagster (1999), Goolsbee (2000), and especially Hall and Liebman (2000) and Perry and Zenner (2001). This article draws upon and extends preliminary research we reported in Rose and Wolfram (2000*a*).

total compensation (valuing options at exercise), the seventieth percentile of cash compensation, and the ninety-fifth percentile of salary over 1991–93 for the 1,282 firms in our full compensation data set.

Section 162(m) details several exemptions from the $1 million limit. Two are particularly noteworthy.[5] First, the limit applies only to the five named executive officers of the firm as of fiscal year end. Some firms, particularly in the early postenactment years, encouraged or required executives to defer any portion of compensation in excess of $1 million until after retirement, as a means of preserving full deductibility of executive pay. From the CEO's perspective, the ability to compound deferred compensation at attractive, tax-free interest rates inside the firm may have made this option appealing. Roughly 10% of the firms in our sample explicitly used deferred compensation to maintain executive pay deductibility under section 162(m).[6]

Of broader relevance is the exemption for "qualified performance-based compensation" (IRS par. 9001B, sec. 1.162-27[e][1]). This requires shareholders to approve plans that base compensation on objective performance targets and are administered by compensation committees composed only of outside directors. All compensation paid under qualified plans is exempt from the cap, even if it exceeds $1 million. If the expected tax savings exceed the cost of losing subjective discretion over bonus and long-term incentive payments, firms may substitute qualified compensation plans for less formal or more discretionary nonqualified plans.

The trade-off between tax savings and qualification costs seems particularly to favor qualification of stock options plans. Qualification requires shareholders to approve just two parameters of a stock options plan: the total number of options and the limit on cumulative awards to any one individual during the plan's life. Boards may determine individual option grants each year, and options with exercise prices equal to or greater than the current stock price are considered to be entirely performance-based compensation. The ease of qualifying options compensation may serve to enhance the attractiveness of options compensation further, which, as Hall and Liebman (2000) note, already had accounting and modest tax advantages relative to cash compensation.[7]

Qualification imposes more stringent ex post constraints on bonus and

[5] In addition, sec. 162(m) applies only to compensation considered wage-based compensation under the Federal Insurance Contributions Act. Certain signing bonuses and other preemployment payments may be structured to be exempt from sec. 162(m) limits.

[6] See, e.g., Coastal Corporation's March 1995 and March 1996 proxy statement payments. Deferred compensation is reported on proxy statements for the year in which it is earned but is taxed for an individual in the year it is received.

[7] The extent to which this has contributed to the ongoing explosion of options-based pay over the past decade is beyond the scope of the present analysis.

long-term incentive plans (LTIPs): compensation must be paid "solely on account of the attainment of . . . pre-established, objective performance goals," for which the outcome is "substantially uncertain," using an "objective formula or standard" (IRS par. 9001B, sec. 1.162-27[e]). The proposed compensation plan and maximum amounts payable to individuals upon attainment of performance goals must be disclosed to and approved by shareholders before the compensation is awarded.[8] Attainment of the performance goals must be certified by a compensation committee composed solely of defined "outsiders" on the board of directors. Qualification may impose real costs on firms by limiting the use of qualitative performance measures and board discretion.[9]

The formulaic approach does not entirely eliminate boards' discretion, however. Although the regulations do not exempt compensation from the cap if it exceeds that generated by the qualified plan, they explicitly allow firms to pay less than the plan would generate and maintain full deductibility (IRS par. 9001B, sec. 1.162-27[e][2][iii]). Some have suggested that this may induce boards to choose more generous ex ante compensation plans to relax constraints imposed by the qualification regulations, knowing that they may later scale back ex post awards.[10]

The expected effect of section 162(m) on the level of executive pay is difficult to sign. On the one hand, section 162(m) increases the after-tax

[8] The regulations allow companies considerable latitude in what, if any, details are disclosed to shareholders, based on whether the "the compensation committee determines that the information is confidential commercial or business information, the disclosure of which would have an adverse effect" on the firm (IRS par. 9001B, sec. 1.162-27[e][4][iii]).

[9] For example, Gillette's 1995 proxy statement recommended shareholder approval of a modified stock options plan to qualify under sec. 162(m) but explicitly declined to modify their bonus plan, which awarded CEO Alfred Zeien a nondeductible $1 million bonus payment on top of his $1 million salary for fiscal year 1994. "The [Compensation] Committee has determined that to attempt to amend the Incentive Bonus Plan so that bonuses meet the definition of tax deductible compensation would require changes which would be contrary to the compensation philosophy underlying that plan and which would seriously impede the Committee's ability to administer the plan as designed in accordance with the judgement of the Committee. The Incentive Bonus Plan was deliberately designed so that individual bonuses were not to be dependent solely on objective or numerical criteria, thus allowing the Committee the flexibility to apply its independent judgement to reflect performance against qualitative strategic objectives." Gillette maintained this position through their latest (2000) proxy statement.

[10] Crystal (1995) noted, "here's what some boards have done: They have deliberately adopted a bonus formula that produces far more money than they would ever expect to pay—and then reduced the sum after the fact to what they would have paid had there been no government regulations at all. A case in point is Salomon Bros. In past years, the brokerage firm never gave its CEO a bonus of more than a few million dollars. Now it has adopted a formula that can pay him as much as $24 million every year."

cost of compensation that does not qualify for exemption from the cap. The cap also may serve as a focal point for latent political hostility to high and rising executive pay levels, leading to some compression in executive pay, ceteris paribus. On the other hand, the implementation of the cap appears to mitigate many of these pressures. While the initial rhetoric concerned pay levels, the final legislation targeted reforming the compensation process with an emphasis on performance-based pay. In simple models with risk-averse agents, a tilt toward riskier performance-based pay would suggest an increase, not decrease, in mean pay levels. Behavioral responses to section 162(m) also may tend to raise compensation for some executives. If specifying a cap at $1 million creates a presumption that this is the "expected" level of CEO compensation, or if boards respond to the negative discretion option by selecting more generous ex ante qualified compensation plans and fail to scale back formula awards fully, this provision may induce an unintended increase in compensation; see Tversky and Kahneman's (1974) discussion of expectations bias toward focal points.

The predicted effect of section 162(m) on the empirical slope relationships between compensation and measures of firm performance, such as stock market returns, is also ambiguous. Firms may shift compensation away from inherently non–performance-based salary toward tax-advantaged, performance-based forms of executive pay. All else constant, this would tend to increase the responsiveness of overall pay to relevant performance measures. Reducing discretionary pay components in bonus and LTIPs and requiring payments to be linked to "objective" performance measures may generate payouts that move more tightly with conventional performance measures used in compensation regressions, such as stock market or accounting rates of return. This would tend to raise the measured responsiveness of pay to these variables. On the other hand, all else may not be constant. If qualified plans generate greater expected compensation variance than do more discretionary plans, particularly in low states over which executives may have little control or influence, boards may react to their reduced discretion by narrowing the range of payouts generated by plans. This works against compositional effects that increase the pay-for-performance sensitivity.

The theoretical ambiguity of predicted section 162(m) impact on both the level and the structure of executive pay suggests the importance of empirical analysis for evaluating this policy. We turn next to a discussion of how to construct an empirical test of its possible effects.

II. Measuring the Effects of Section 162(m)

Assessing the impact of any policy change requires one to establish an appropriate counterfactual. Our challenge is to measure CEO pay relative

to what it would have been after 1993 without section 162(m). We discuss below the advantages and disadvantages of several possible benchmarks. To illustrate these, begin with a basic compensation model in which changes in log compensation of CEO i in year t are a function of changes in a vector of control variables, ΔX_{it}, an associated parameter vector β_0, year effects denoted by δ_t, and a random error denoted by ϵ_{it}:[11]

$$\Delta \ln (Compensation_{it}) = \beta_0 \times \Delta X_{it} + \delta_t + \varepsilon_{it}. \quad (1)$$

A. Before-and-After Comparisons

One simple approach uses time-series variation in pay patterns to estimate the effect of section 162(m). Mean growth rates before and after the policy change can be constructed from raw compensation data or estimated year effects in equation (1) and compared. This test cannot be wholly dispositive, however, as executive pay changes over time for reasons independent of tax policy (see Hall and Liebman 2000). A time-series comparison is particularly troublesome in the case of section 162(m), which is part of a broad policy shift that may have influenced executive pay. The proxy disclosure regulations issued by the Securities and Exchange Commission (SEC) in October 1992 and the OBRA 1993–related changes in personal and corporate income tax rates are particularly problematic.[12]

B. Affected versus Unaffected Firms

An alternative approach compares compensation patterns at firms that were affected by the cap with those at firms with compensation well below the section 162(m) limits. If we can identify firms with notional nondeductible compensation in excess of $1 million as *AFFECTED* and compare their post–section 162(m) compensation behavior with that at firms with notional nondeductible compensation below $1 million, the difference might tell us how section 162(m) influenced behavior at the first group of firms. We advocate a "difference-in-differences" model that allows compensation at high-paying (*AFFECTED*) firms to differ from that at lower-paying firms even in the absence of section 162(m), and measure the policy's effect from changes in this difference subse-

[11] Note that one could model compensation levels in a similar fashion.

[12] Murphy (1995, 1996) shows that firms responded to 1992 changes in SEC regulations by choosing the options valuation method that minimized reported compensation values, suggesting that firms may perceive political costs of higher reported executive pay. Goolsbee (2000) argues that personal tax changes in OBRA 1993 influenced total realized compensation by encouraging executives to exercise options in late 1992 (see, however, Hall and Liebman 2000).

quent to section 162(m).[13] To implement this approach, define a dummy variable, *SEC162*(*m*), equal to one in years after the policy change, zero otherwise. Modify equation (1) to estimate

$$\begin{aligned}\Delta \ln(Compensation_{it}) = {} & \beta_0 \times \Delta X_{it} + \beta_1 \times SEC162(m) \times \Delta X_{it} \\ & + \alpha_2 \times AFFECTED + \beta_2 \times AFFECTED \\ & \times \Delta X_{it} + \alpha_{12} \times SEC162(m) \times AFFECTED \\ & + \beta_{12} \times SEC162(m) \times AFFECTED \\ & \times \Delta X_{it} + \delta_t + \varepsilon_{it},\end{aligned} \tag{2}$$

where α_2 measures the difference in mean compensation growth rates between *AFFECTED* and unaffected firms before the policy change and α_{12} measures the policy effect as the difference in this difference after section 162(m). Similarly, β_1 captures changes in the compensation slope relationships after section 162(m), β_2 measures differences in the slopes for *AFFECTED* firms prior to section 162(m), and β_{12} captures differential section 162(m) effects for *AFFECTED* firms.

Three principles are important in defining *AFFECTED* firms. First, one should not create statistical endogeneity between compensation and *AFFECTED*. Using current compensation to define affected firms, as some past studies have done, will introduce a correlation between compensation and *AFFECTED* even when no section 162(m) effect exists. Defining *AFFECTED* by lagged compensation will induce a correlation with the error in compensation first-difference regressions, in levels regressions if CEO- and firm-specific fixed effects are not controlled for, and in fixed-effect levels regressions if there is regression to the mean in executive pay.[14] Using a difference-in-differences estimator may mitigate this concern.

Second, *AFFECTED* should not be contaminated by firms' responses to section 162(m). If firms reduce compensation in response to the cap, using post-1993 pay may suggest that a firm is unaffected when the cap

[13] Controlling for the possibility that compensation policies at larger or higher-paying firms may differ from those at smaller firms is important. Empirical implementation requires sufficient data to establish the base-period coefficients, however, and implicitly assumes that the pay relation across the two groups would remain constant but for sec. 162(m). Unfortunately, the short span of salary and options award data prior to 1993 implementation of revised SEC proxy disclosure rules sharply limits the power of this methodology.

[14] This suggests the need for caution in interpreting results reported in Hall and Liebman (2000) and Perry and Zenner (2001) that measure the impact of sec. 162(m) using *MILLION*, defined as the minimum of (lagged salary compensation/$1,000,000, 1), and the possible need for caution for results measuring *AFFECTED* by dummy variable indicating lagged salary compensation in excess of $900,000.

is in fact quite binding. Defining *AFFECTED* as reported CEO cash compensation of more than $1 million in any year from 1992 to 1997 (as do Perry and Zenner 2001) yields a fixed firm characteristic that is based largely on post–section 162(m) pay. This creates another set of difficulties. Its effect is identified from behavior that may include periods in which firms are not actually constrained by section 162(m) limits. This definition may capture differences in compensation determination for firms generally in the upper part of the compensation distribution rather than an effect of section 162(m) per se. An ex ante measure that identifies which firms are likely to be affected by section 162(m), and when, may avoid many of these problems.

Third, careful consideration should be given to which components of compensation should be included in the determination of affected firms and at what level of compensation firms may act as though they are "affected" by the cap. We argue for using a cash compensation measure, the sum of salary and bonus, to define which firms are affected by section 162(m) in a given year.[15] Using salary payments, as do Hall and Liebman (2000) and two of Perry and Zenner's (2001) definitions, seems inappropriately narrow. Firms paying salaries of less than $1 million will nonetheless be affected by section 162(m) if their bonus payments or other compensation components generate total compensation in excess of the $1 million cap. On the other hand, total compensation, which includes option awards, seems too broad. The ease of qualifying stock options plans suggests that firms below the cap in all but expected options awards should qualify their options plans and continue on a "business as usual" path.

We therefore define *AFFECTED* firms by whether their predicted *CASH* compensation in year t is greater than or equal to $1 million. Predicted *CASH* compensation is based on firm-level data prior to 1993, as detailed in the appendix. This definition alleviates many but not all of the concerns raised by earlier definitions. It is a noisy measure of whether a firm's notional compensation is sufficiently high to make the cap a possible consideration, and, while not driven by firms' responses to the cap, it is not entirely free from potential influences of section 162(m) at the aggregate level. We therefore complement ordinary least squares (OLS) regressions with instrumental variables regressions that define *AFFECTED* firms as those with actual *CASH* compensation of at least $1 million in a given year, and instrument with our predicted *AFFECTED* variable.

[15] While we have strong economic reasons to prefer definitions based on cash compensation, we have looked at definitions based on predicted total compensation and salary measures to ensure that our results are not particularly sensitive to this choice. In general, we find that the results based on cash compensation are less noisy than are the others, as would be expected if the other compensation measures are less precise in categorizing *AFFECTED* firms.

Table 1
Fraction of Firms Qualifying Compensation Plans for Section 162(m) Exemption as of 1997

Type of Compensation Plan Qualified	All Firms (n = 968)	Firms That Used Compensation Type before 1994 (n)	Firms with Predicted Cash Compensation (n = 870)	*AFFECTED* Firms (n = 737)	*UNAFFECTED* Firms (n = 133)	*AFFECTED* Firms That Used Compensation Type before 1994 (n)
Bonus	.41	.41 (887)	.42	.47	.14	.46 (704)
Long-term incentive	.21	.38 (253)	.22	.24	.12	.39 (227)
Stock options	.68	.70 (787)	.68	.70	.59	.73 (633)
Bonus and stock	.34	.35 (761)	.34	.38	.11	.40 (613)
Any type	.76	.77 (914)	.77	.80	.61	.80 (725)
All types	.12	.25 (212)	.13	.15	.05	.27 (191)

C. Qualifiers versus Nonqualifiers

Firms differ not only in whether they are likely to be affected by the deductibility limit but also in their decisions to qualify compensation plans for section 162(m) performance-based exemption (see Woodlock and Antenucci 1996, 1997). Table 1 tabulates the fraction of firms in our data set that had qualified various compensation plans as of 1997. We report qualification rates overall, as a function of whether the firm used a given compensation type prior to 1994, and as a function of whether the firm was predicted to be *AFFECTED* by the deductibility limits. Overall, firms were most likely to have qualified stock options plans; about two-thirds of the full sample had done so by 1997. Forty percent had qualified bonus plans; half this fraction had qualified LTIPs.

There are substantial differences between *AFFECTED* and unaffected firms (compare cols. 4 and 5 of table 1).[16] *AFFECTED* firms were more than twice as likely as unaffected firms to qualify LTIPs and three times more likely to qualify their bonus plans. There is a much smaller gap across *AFFECTED* and unaffected firms in options plan qualification rates, as would be expected if qualifying stock options plans is relatively simple and low-cost for most firms. Overall, four-fifths of *AFFECTED* firms qualified at least one compensation plan for section 162(m) exemption.

Differences in qualification rates that arise from heterogeneity in the composition of executive pay across firms seem important only for LTIPs (compare cols. 1 and 2, or 4 and 6, of table 1). When we consider only firms that reported some payment in a given compensation category prior to 1994, roughly three-quarters of *AFFECTED* firms qualified their stock

[16] Unconditional means (col. 3) are similar to means for *AFFECTED* firms (col. 4), as the latter group accounts for approximately 80% of the sample firms in 1997.

options plans, slightly less than half qualified their bonus plans, and just under 40% qualified their LTIPs (col. 6).

To further explore the heterogeneity suggested in table 1, we estimate a proportional hazard model of plan qualification:[17]

$$\begin{aligned} h_{ijt}(t, X_{it}, \xi_{jk}, \gamma_j) \equiv{}& \Pr(\text{firm } i \text{ in industry } k \text{ qualifies plan type } j \text{ at time } t \mid \\ & \text{firm } i \text{ has not qualified plan type } j \text{ before time } t) \\ ={}& h_{0j}(t) \times \exp[\gamma_{0j} + \gamma_{1j} \times \ln(SALES_{it}) \\ & + \gamma_{2j} \times MARKET\ RETURN_{it} \\ & + \gamma_{3j} \times RETURN\ ON\ ASSETS_{it} \\ & + \gamma_{4j} \times MID\ FISC\ YEAR_{it} + \gamma_{5j} \times AFFECTED_{it} \\ & + \gamma_{6j} \times NO\ TAX_{it} + \gamma_{7j} \times NO\ TAX_{it} \\ & \times AFFECTED_{it} + \gamma_{8j} \times TURNOVER \\ & + \gamma_{9j} \times USED\ COMP\ TYPE_{ij} + \xi_{jk}], \end{aligned} \tag{3}$$

where j indexes plan type (bonus, stock options, long-term incentive, or stock options and bonus). Variable definitions and construction are detailed in the appendix. The baseline hazard rates $h_{0j}(t)$ and $\{\gamma_{nj}\}$ are parameters of the model. An industry-specific effect, ξ_{jk}, captures differences in industry norms or other industry-correlated effects. We estimate Cox proportional hazard models that allow the baseline hazard to vary nonparametrically over time for each type of qualification decision, and we treat companies that had not qualified a plan of type j by the 1997 sample's end date as right-censored.

Estimated hazard ratios for each variable are reported in table 2.[18] The pattern of estimates is robust across different qualification decisions, though the statistical precision of the point estimates varies. Larger firms, as measured by *SALES*, are more likely to qualify each compensation plan type, all else equal. The estimates suggest that doubling *SALES* increases predicted hazard rates by one-quarter to one-half, moving from a mean hazard rate of .17 to a hazard rate of .24 for bonus plans, for example. Performance variations (measured by either *MARKET RE-*

[17] Balsam and Ryan (1996) estimate a logit model of 1994 bonus plan qualification on a sample of 155 firms with reported 1992 salary and bonus in excess of $1 million, including controls for firm sales, expected tax cost of noncompliance, and the historical performance sensitivity of CEO pay at the firm. Our analysis differs from theirs in a number of important ways, most significantly in eliminating the severe sample selection bias in their analysis; see Porter's (1996) discussion.

[18] A value of 1.0 for the hazard ratio indicates that the variable neither raises nor lowers the expected hazard rate.

Table 2
Cox Proportional Hazard Models: 1994–97 Compensation Plan Qualification

	Plan Type			
	Bonus	LTIP	Stock Options	Options and Bonus
ln(*SALES*)	1.39*	1.33*	1.27*	1.52*
	(.09)	(.11)	(.07)	(.11)
MARKET RETURN	.75	.88	1.04	.96
	(.16)	(.24)	(.15)	(.20)
RETURN ON ASSETS	4.40	1.55	.94	2.48
	(5.73)	(2.64)	(.90)	(3.27)
MID FISC YEAR	.12*	.64	.14*	[a]
	(.07)	(.40)	(.07)	
AFFECTED	3.28*	1.61*	1.21	3.20*
	(.70)	(.43)	(.44)	(.86)
NO TAX	1.41	.86	1.20	1.24
	(.81)	(.32)	(.44)	(.96)
NO TAX × *AFFECTED*	.52	[b]	.68	.77
	(.33)		(.30)	(.63)
TURNOVER	.70*	.96	.74*	.73*
	(.10)	(.17)	(.09)	(.11)
USED COMP TYPE	1.12	2.65*	1.45*	1.34
	(.38)	(.50)	(.24)	(.29)
N	2,027	2,281	1,845	2,213
Likelihood ratio	−766.16	−509.90	−992.26	−667.67

NOTE.—Table reports hazard ratios (standard errors) from Cox proportional hazard models (see eq. [3]). All models include unreported industry fixed effects.

[a] No firms with *MID FISC YEAR* qualified stock and bonus plans in 1994, so this hazard ratio would be identically zero in the model.

[b] *NO TAX* and *NO TAX* × *AFFECTED* are perfectly collinear for firms qualifying their LTIP plans.

* $p \leq .10$ for the test-hazard ratio$_{nj} = 1.00$.

TURN or *RETURN ON ASSETS*) do not seem to have any predictive power. *USED COMP TYPE*, which indicates whether the firm reported compensation of that type prior to section 162(m), is a strong predictor of qualification for LTIPs and stock option plans. Its imprecisely estimated impact on bonus plan qualification may be in part due to the limited variation in this variable for bonus plans. Almost 90% of our firms reported bonus payments prior to 1994, in comparison with 71% awarding stock option grants and 24% with LTIP payouts.

Results for the remaining variables suggest that qualification decisions are responsive to potential tax benefits of qualification. *AFFECTED* firms were two to three times more likely to qualify bonus, long-term incentive, and a combination of bonus and options plans than were firms not likely to be affected by the deductibility cap, all else equal.[19] The point estimates

[19] We also estimate specifications in which the qualification decision is a function of the amount by which predicted compensation exceeds $1 million (*EXCESS*), either for the CEO alone or aggregated over ExecuComp's reported five highest-paid executives. These variables do not add materially to the predictive power of our model once we control for *AFFECTED*, and the hazard ratios for *EXCESS* compensation variables generally are extremely close to one.

hint that this effect may be mitigated for firms without current federal income tax liability (see *NO TAX* × *AFFECTED*), but they are not statistically distinguishable from hazard ratios of 1.00. *MID FISC YEAR* identifies firms that were not affected by the deductibility limits until data year 1995; they were much less likely to qualify plans in 1994 than were other firms. This effect is significant for all plan types other than LTIPs, suggesting that firms delayed compliance if regulations were not binding. Finally, firms that might have anticipated CEO turnover within the next 3 years (*TURNOVER*) were 25%–30% less likely to qualify bonus and stock options plans. If a CEO is likely to leave office in the near term, firms may use deferred compensation to meet deductibility limits and postpone plan restructuring and qualification until a new CEO comes on board.

Not all *AFFECTED* firms chose to qualify plans, nor were all firms that qualified plans for section 162(m) exemption *AFFECTED* by the deductibility cap.[20] This variation may enable us to distinguish the impact of the deductibility cap from the impact of the qualification requirements. We test this by introducing to the compensation model an additional set of interaction terms with *QUALIFIED*, a variable that identifies firms choosing to qualify plans for section 162(m) exemption:[21]

$$\begin{aligned}\Delta \ln(Compensation_{it}) = {} & \beta_0 \times \Delta X_{it} + \beta_1 \times SEC162(m) \times \Delta X_{it} \\ & + \alpha_2 \times AFFECTED + \beta_2 \times AFFECTED \times \Delta X_{it} \\ & + \alpha_3 \times QUALIFIED + \beta_3 \times QUALIFIED \times \Delta X_{it} \\ & + \alpha_{12} \times SEC162(m) \times AFFECTED \\ & + \beta_{12} \times SEC162(m) \times AFFECTED \times \Delta X_{it} \\ & + \alpha_{23} \times QUALIFIED \times AFFECTED \\ & + \beta_{23} \times QUALIFIED \times AFFECTED \times \Delta X_{it} \\ & + \delta_t + \varepsilon_{it}.\end{aligned} \tag{4}$$

[20] Some companies qualify compensation plans for sec. 162(m) exemption even when their historical executive pay levels suggest that the $1 million cap is unlikely to bind. This may be due to factors observable to the firm but not observable to us that suggest the cap will in fact be binding, or it may be due to political pressure to appear "tough" on executive compensation decisions regardless of proximity to the $1 million deductibility cap.

[21] The interaction terms *SEC162*(*m*) × *QUALIFIED* are omitted from this model, as they differ from *QUALIFIED* for only 5 firm-years. Our data record three firms as qualifying bonus plans and five firms as qualifying stock plans in 1994, even though sec. 162(m) did not apply until their fiscal year 1995 compensation.

Because *QUALIFIED* is clearly endogenous, we use estimates of the predicted probability of qualifying bonus (from col. 1, table 2) and options (col. 3, table 2) plans for each firm-year in our sample as instruments for actual qualification decisions in models based on equation (4).[22]

III. Empirical Analysis of Section 162(m)'s Effects on Compensation

A. Descriptive Results

It is instructive to analyze descriptive patterns in the compensation data before we estimate parametric regression models of section 162(m)'s effects. The initial focus of section 162(m) political rhetoric on "excessive" executive compensation suggests an examination of compensation growth effects. Table 3 explores growth rates for different measures of CEO pay over time and across groups of firms. Rows 1–3 report 1985–90 data from the *Forbes* annual surveys of CEO compensation. *CASH* compensation (salary and bonus) and *EX POST TOTAL* compensation (valuing options if and when they are exercised) are available for this time period. The remaining rows are based on ExecuComp data for 1992–97, which provides us with additional *SALARY* and *EX ANTE TOTAL* compensation measures.

Comparing growth rates from before and after section 162(m)'s implementation suggests no clear pattern. Within the ExecuComp sample, all compensation measures except *EX ANTE TOTAL* have lower mean growth rates after section 162(m). Interperiod differences are significant at the .10 level or better only for *SALARY* and *CASH*. The *Forbes* data suggest caution in attributing these differences to a policy change. For both *CASH* and *EX POST TOTAL*, which are available over the entire

[22] It is difficult or impossible to define a convincing set of instruments that influence the qualification decision but clearly do not belong in a compensation equation. Our compensation model follows established norms in the compensation literature by excluding *USED COMP TYPE*, *NO TAX*, *MID FISC YEAR*, and *TURNOVER*, which are used to predict qualification decisions. The argument for the exclusion of *MID FISC YEAR* is perhaps strongest, although the variable identifies only variation in the decision to qualify in data year 1994 and is equal to one for only 108 observations. For the other three excluded variables, one could construct arguments of varying degrees of plausibility to suggest they belong in a compensation equation. For example, perhaps *NO TAX* proxies for firm performance in ways not directly controlled for by the performance measures we use. *USED COMP TYPE* may be correlated with underlying factors that make it more expensive or less convenient for a given firm to use a particular form of compensation and affect its level. To the extent these unobserved factors are constant over time at a given firm, first-differencing or including firm-fixed effects in the compensation regressions strengthens the exclusion restriction. Identification in the absence of reasonable exclusion restrictions relies primarily on functional form assumptions implicit in the hazard model.

Table 3
Mean Annual Growth Rates in Same-CEO Nominal Compensation

	Compensation Measure				
	SALARY	*CASH*	*EX ANTE TOTAL*	*EX POST TOTAL*	Annual CPI Growth
Pre–section 162(m):					
1985–90 (n = 2,249)	. . .	.151	. . .	.387	.041
UNAFFECTED	. . .	.147	. . .	.348	. . .
AS IF AFFECTED	. . .	.158	. . .	.444	. . .
1992–93	.112	.198	.291	.726	.028
Post–section 162(m):					
1994–97 (n = 2,977)	.077	.143	.418	.593	.026
UNAFFECTED	.085	.136	.410	.532	. . .
AFFECTED	.071	.149	.426	.650	. . .

SOURCE.—1985–90 data are from *Forbes*; 1992–97 data are from ExecuComp.
NOTE.—*AS IF AFFECTED*: predicted cash compensation exceeds $850,000, otherwise *UNAFFECTED*. *AFFECTED*: predicted cash compensation exceeds $1 million, otherwise *UNAFFECTED*.

1985–97 period, ExecuComp growth rates after section 162(m) are similar to *Forbes* growth rates before section 162(m).

We also divide our 1985–90 and 1994–97 samples into affected and unaffected firms. For the post–section 162(m) sample, we define *AFFECTED* based on predicted compensation in excess of $1 million, which is about the seventy-fifth percentile of the cash compensation distribution in the early 1990s. Firms paying more than this would be subject to the section 162(m) deductibility limits. Observations in the 1985–90 *Forbes* data are defined to be *AS IF AFFECTED* if their predicted pay exceeds $850,000, about the seventy-fifth percentile of cash compensation for the 1980–90 *Forbes* sample. While the *AS IF AFFECTED* firms are in the same part of the compensation distribution as *AFFECTED* firms, prior to 1994 there is no actual treatment difference between them and their unaffected counterparts. In the ExecuComp data, post–section 162(m) mean growth rates were higher for *AFFECTED* firms than for unaffected firms for every compensation measure except *SALARY*. This compares with higher *EX POST TOTAL* compensation growth rates but lower *CASH* growth rates for *AS IF AFFECTED* firms in the 1985–90 *Forbes* data. Differences between affected and unaffected firms are not statistically significant, apart from *SALARY*. These raw data provide no evidence of section 162(m) impact on the growth of cash or total compensation at *AFFECTED* firms.

The data hint at a possible section 162(m) effect on *SALARY* growth. Not only are post–section 162(m) *SALARY* growth rates lower than those in 1992–93, but firms more likely to hit the tax cap (*AFFECTED*) also have lower 1994–97 *SALARY* growth rates than do firms not expected to exceed the cap, significant at the .01 level. This is similar to *SALARY* regression results reported by Hall and Liebman (2000) and salary change

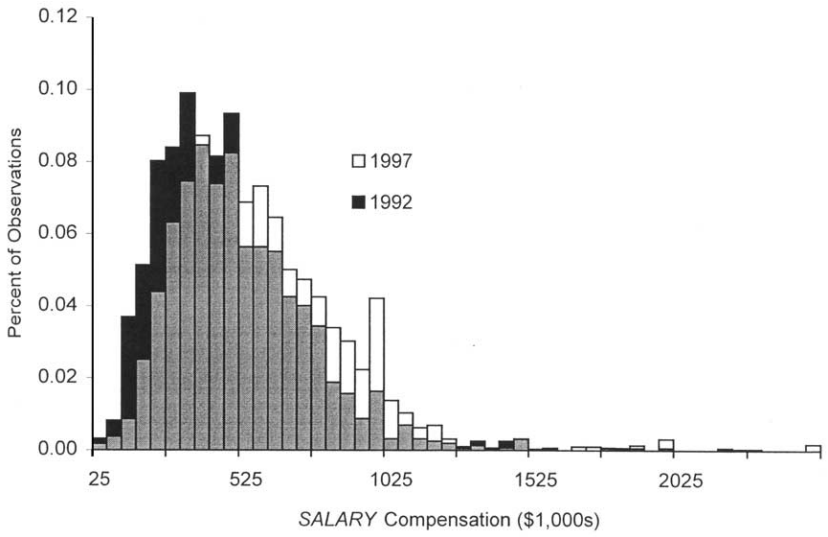

FIG. 1.—*SALARY* histogram. Bins are $50,000 wide. Salary axis labels record the minimum salary for the bin beginning at the corresponding tick mark. The graph is truncated at $2.5 million in *SALARY*. Black bars represent 1991–92 *SALARY* distribution, white bars represent 1995–97 *SALARY* distribution, and gray bars represent overlap in the distributions. Source: ExecuComp data.

analysis reported by Perry and Zenner (2001), although their use of lagged actual compensation to define *AFFECTED* firms makes it difficult to discern the role of possible mean reversion in this result. Because *SALARY* data are not reported before 1991, we cannot use *Forbes* data to explore growth rates for the late 1980s.

We next analyze the empirical distribution of *SALARY* levels, using ExecuComp data for 1991–97. We divide the salary distribution into $50,000 bins, centered at $50,000 increments ($50,000, $100,000, etc.). Figure 1 plots histograms of the *SALARY* distribution before the tax change (1991–92) and following its implementation (1995–97).[23] The 1991–92 *SALARY* distribution (black and gray bars) has a median of $400,000 and mean at $450,000, with half the observations falling between $311,000 and $645,000. The mass at $1 million (just to the left of the 1,025 tick mark) is slightly higher than the mass of the adjacent bins, with 26 observations (1.6%). There is a long, thin right tail. The 1995–97 distribution (gray and white bars) suggests a rightward shift from the 1991–92 distribution, as would

[23] To focus attention on the main part of the *SALARY* distribution, the graph records the distribution up to $2.5 million in *SALARY*. This omits one observation in 1991–92 and four observations in 1995–97 with *SALARY* above $2.5 million. We omit the transitional period of 1993–94.

be expected from an aggregate increase in nominal CEO salaries. The median and mean *SALARY* each increase by about $150,000 between the two periods. The bin at $1 million is particularly noteworthy. There is a substantial increase in the mass at this point in the 1995–97 sample, with 123 observations (4.2%) in the bin centered at $1 million. This is sufficient to create a secondary peak in the distribution that is half as high as the modal peaks between $400,000 and $500,000. The question is whether section 162(m) focused more mass at the $1 million cap than would have been expected from salary inflation alone.

To test the statistical significance of the *SALARY* spikes at $1 million, we used a method Degeorge, Patel, and Zeckhauser (1999) suggested for testing the "smoothness" of the empirical distribution. When we use their metric, the hypothesis that the distribution is continuous and smooth at $1 million is rejected in both periods. The discontinuity is twice as large in the post–section 162(m) environment, however, with the probability of a difference this large occurring by chance under common distributions just above 5%.[24] Absent specific assumptions about the shape of the *SALARY* distribution or how it shifts over time, we cannot definitively conclude that $1 million has become a greater focal point post–section 162(m).[25] However, the data suggest some possibility of this, consistent with the evidence in table 3 that CEOs of companies affected by section 162(m) limits experienced lower salary growth than CEOs of unaffected firms. It is also consistent with finer cuts of our data that suggest that both mean and median salary growth

[24] We divide the data into $50,000-wide salary bins centered at each $50,000 mark and construct the statistic $\tau_n = \{\Delta p(x_n) - \text{mean}[\Delta p(x_{i,\, i \neq n})]\}/\{\text{mod SD}[\Delta p(x_{i,\, i \neq n})]\}$, where $p(x_i)$ is the fraction of observations in bin i, and Δ denotes changes from bin $i - 1$ to bin i. We calculate the mean $\Delta p(x_i)$ for 5 bins below $1 million and 3 bins above $1 million, excluding the bins at and immediately adjacent to $1 million. For our data, $\tau_{\text{million}} = 1.99$ for the 1991–92 distribution, and $\tau_{\text{million}} = 5.53$ for the 1995–97 distribution. The test of the null hypothesis that the excess mass at $1 million is the same across the two periods produces a t-statistic of 1.61, rejecting the null at about the 6% level for a one-sided test of greater mass in the later period. We also construct these statistics using $100,000-wide bins, centered at each $100,000, and comparing $\Delta p(x_i)$ at $1 million with the mean for 4 bins below and 2 bins above excluding those adjacent to $1 million. In this case, the test statistic rejects smoothness only for the 1995–97 distribution: $\tau_{\text{million}} = .69$ in 1991–92 and $\tau_{\text{million}} = 1.71$ for 1995–97.

[25] Even with distributional assumptions, the answer may be ambiguous. For example, under the assumption that *SALARY* follows a Pareto distribution and the null hypothesis of no sec. 162(m) effect, the ratio of adjacent bin heights should be unchanged from one period to the next. While this ratio is the same for 1991–92 and 1995–97 (about 1.9) when comparing $50,000-wide bins at $1 million and $950,000, it is much higher following sec. 162(m) when comparing $100,000-wide bins at $1 million and $900,000 (.71 in 1991–92 vs. 1.10 in 1995–97). We thank David Levine for suggesting this test.

rates are lowest for executives who were at salaries of $1 million in the post–section 162(m) period.[26]

We next divide the sample into firms that had qualified their bonus plans for section 162(m) exemption by 1995 ("qualifiers") and those that had not.[27] For firms with qualified bonus compensation plans, bonus payments under the plan are deductible even if they lead to compensation above the $1 million cap. Regardless of qualification status, however, firms can never deduct salary in excess of $1 million. In 1991–92, the *SALARY* distributions (not shown) are quite similar across the two groups.[28] The 1995–97 salary distributions, however, differ substantially across the two groups of firms. Figure 2 plots kernel density estimates of the 1995–97 *SALARY* distribution for qualifiers and nonqualifiers. There is substantially more massing between $600,000 and $1 million for the qualified group. The salary spike at $1 million is higher for both groups of firms after section 162(m) than before and nearly equal to the height of the mode for the qualified group. This evidence is suggestive of salary compression around $1 million among qualifiers, though this is not necessarily causal.

Figure 3 plots kernel density estimates of 1995–97 *CASH* compensation for qualifiers and nonqualifiers.[29] *CASH* compensation exhibits greater variation. Its distribution is flatter and much less smooth than the *SALARY* distribution, an effect particularly prominent among qualifiers. The flattening of the *CASH* distribution, combined with observed *SALARY* compression around $1 million, is consistent with greater heterogeneity in bonus payments across qualified firms, perhaps because of greater re-

[26] Complementary evidence is provided by Perry and Zenner (2001), who stratify their sample by salary level and year. They find that firms near $1 million are less likely to have increased their salary levels over the previous year than are firms paying below $900,000. They do not perform this analysis at other focal points, however.

[27] This categorization is likely to understate differences between the two groups during the 1995–97 period, as the "nonqualifier" group includes both firms for which the cap does not bind (notional compensation is below $1 million) and those affected by the cap. Moreover, firms in the "nonqualifier" group may have qualified one or more compensation plans in 1996 or 1997.

[28] The distribution for qualifiers seems shifted slightly to the right relative to that for nonqualifiers, as the secondary and tertiary peaks of the distribution, at $400,000 and $700,000 for nonqualifiers, are the tertiary and secondary peaks, respectively, for the qualifiers. The 1991–92 mass at $1 million also is slightly larger for the qualified group.

[29] We restrict the plots to cash compensation below $5 million to allow for sufficient detail in the graphs. Cash compensation has a very long, thin tail, with a maximum observed value of $102 million in our full data set.

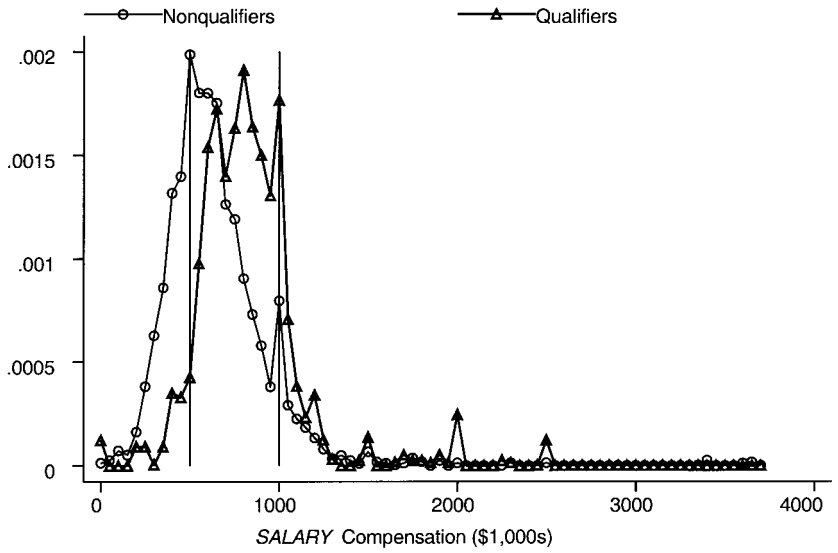

FIG. 2.—Kernel density estimates of the 1995–97 *SALARY* distribution by 1995 qualification status. Graph is truncated at $2.5 million. Source: ExecuComp data.

liance on performance-based bonus schemes.[30] The variance makes it difficult to draw strong conclusions about section 162(m) effects from the unconditional *CASH* distribution data, however.

B. Regression Results

We investigate whether standard compensation regression models detect possible section 162(m) effects by estimating variants of the models described in Section II. We first report results that constrain the slope parameter vector (β) to be constant over time and across firms. The regressions are estimated over 1993–97, which in principle allows us to identify α_{12}, the effect of section 162(m) on compensation growth rates at *AFFECTED* firms. We stress that the difference-in-differences estimates are limited by the fact that there is only one data year (1993) prior to section 162(m) for most firms.[31] We report results that relax the slope constraints at the end of this section.

In table 4 we report results for compensation levels equations, using ln(*SALES*), *MARKET RETURN*, and *RETURN ON ASSETS* as control

[30] Other explanations could also be consistent with the observed differences in the distributions. These figures are suggestive, not dispositive, of a sec. 162(m)–related effect.

[31] There are two years (1993 and 1994) for firms with fiscal years that end in May through November; see the appendix for elaboration.

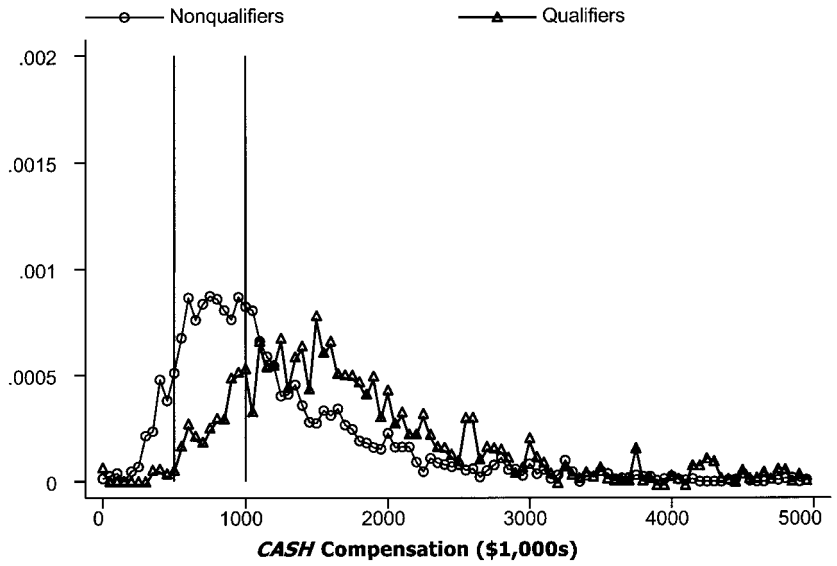

FIG. 3.—Kernel density estimates of the 1995–97 *CASH* compensation distribution by 1995 qualification status. Graph is truncated at $5.0 million. Source: ExecuComp data.

variables and conditioning on CEO-specific and year-specific fixed effects.[32] We report three sets of results for each compensation measure. Ordinary least squares and robust regressions use *PREDICTED AFFECTED* in the regression model; instrumental variables regressions use *PREDICTED AFFECTED* as an instrument for *ACTUAL AFFECTED* in the regression.[33] The weighted instrumental variables (IV) results suggest that firms affected by the section 162(m) cap reduce their *SALARY* compensation level by about 2.5% and their *CASH* and *TOTAL COMPENSATION* levels by 3%–4%, all else equal.[34] These effects are relatively small but statistically distinguishable from zero for *SALARY* and *CASH*. The results in table 4 highlight our dependence on 1993 data to establish a pre–section 162(m) benchmark. Over the 1994–97 period, the overall impact of *AFFECTED* on compensation, measured by the sum of coefficients on *AFFECTED* and *AFFECTED* × *SEC162*(*m*), is not significantly different from zero at conventional levels. Thus, the conclu-

[32] The CEO-specific effect drops out in first-difference specifications.

[33] We use the robust regression routine implemented in Stata 6.0. The weights derived from the robust regression results are used in the weighted instrumental variables regressions and generate a smaller sample size for these specifications.

[34] This result varies with the sample we use. In some larger subsamples of our data, the effect is estimated as a 10%–15% reduction for all three compensation measures.

Table 4
1993–97 Compensation Level Regressions

	ln(*SALARY*)			ln(*CASH*)			ln(*TOTAL*)		
	OLS	Robust	Weighted IV	OLS	Robust	Weighted IV	OLS	Robust	Weighted IV
ln(*SALES*)	.036	.074*	.074*	.174*	.166*	.163*	.272*	.273*	.299*
	(.040)	(.003)	(.004)	(.020)	(.010)	(.011)	(.036)	(.020)	(.024)
MARKET RETURN	−.030*	−.013*	−.013*	.126*	.119*	.117*	.115*	.115*	.138*
	(−.007)	(.002)	(.002)	(.011)	(.005)	(.007)	(.019)	(.011)	(.016)
RETURN ON ASSETS	.047	−.014	−.021	.692*	.933*	.913*	.680*	.876*	1.095*
	(.047)	(.013)	(.018)	(.132)	(.040)	(.060)	(.150)	(.089)	(.140)
AFFECTED	−.017	.015*	.033	.027	.021*	.057	−.019	−.023	−.327*
	(.024)	(.004)	(.023)	(.018)	(.012)	(.061)	(.034)	(.026)	(.165)
AFFECTED × *SEC162*(*m*)	−.044*	−.016*	−.025*	−.040*	−.019*	−.030*	−.010	−.028	−.038
	(.011)	(.003)	(.005)	(.015)	(.010)	(.014)	(.028)	(.021)	(.032)
N	5,753	5,753	4,859	5,753	5,753	4,932	5,668	5,668	4,819
F-test: *AFFECTED* + *AFFECTED* × *SEC162*(*m*) = 0	4.62*	.10	.09	.90	.03	.20	1.10	5.74*	5.04*

NOTE.—Standard errors (robust standard errors in OLS regressions) are in parentheses. All regressions include CEO- and year-specific fixed effects. OLS, robust, and weighted IV are estimation methods. OLS and robust regressions use *PREDICTED AFFECTED*; IV regressions use *PREDICTED AFFECTED* as an instrument for *ACTUAL AFFECTED* and weights generated by the robust regressions.

* Significant at the .10 level or below.

Table 5
1993–97 *SALARY* Compensation First-Difference Regressions

	Full Sample			Qualification Sample		
	Robust	IV (Robust SE)	Weighted IV	Robust	Weighted IV	Weighted IV
Δln(*SALES*)	.040*	.040	.040*	.031*	.032*	.032*
	(.004)	(.041)	(.004)	(.005)	(.005)	(.007)
Δ*MARKET RETURN*	−.008*	−.016*	−.008*	−.011*	−.011*	−.007*
	(.001)	(.007)	(.001)	(.002)	(.005)	(.003)
Δ*RETURN ON ASSETS*	−.015	.096*	−.010	−.027	−.014	.028
	(.012)	(.057)	(.012)	(.018)	(.019)	(.033)
AFFECTED	−.005	−.007	−.008*	−.008*	−.014*	−.014*
	(.003)	(.016)	(.005)	(.004)	(.006)	(.008)
AFFECTED × *SEC162*(*m*)	−.002	−.040*	−.004	−.001	−.003	−.045*
	(.004)	(.017)	(.006)	(.005)	(.007)	(.024)
QUALIFIED STOCK PLAN	. . .	. . .	. . .	. . .	. . .	.057*
						(.030)
QUALIFIED STOCK × *AFFECTED*	. . .	. . .	. . .	. . .	. . .	.035
						(.023)
N	5,318	5,319	4,637	2,887	2,502	2,502

NOTE.—Dependent variable is Δln(*SALARY*). All regressions include year fixed effects. Robust, IV, and weighted IV are estimation methods. Standard errors (robust SE where noted) in parentheses. Robust regressions use *PREDICTED AFFECTED*. Weighted IV regressions use *PREDICTED AFFECTED* and *PREDICTED QUALIFIED STOCK* as instruments for *ACTUAL AFFECTED* and *QUALIFIED STOCK* and weights from the corresponding robust regressions.

* Significant at the .10 level or below.

sion of a post–section 162(m) dampening in compensation levels depends upon whether one believes that 1993 is generally representative of compensation patterns prior to section 162(m).

We next report results for compensation change regressions, continuing to impose the constraint of constant slope parameters (β_0). These model compensation growth rates as a function of *AFFECTED* status (analogous to eq. [2]), or as a function of both *AFFECTED* status and plan qualification decisions (analogous to eq. [4]). First differences of the control variables and year-specific fixed effects are included in all specifications. We have estimated the model for both bonus and stock options plan qualification ($QUALIFIED_j$, $j \in$ [bonus, stock options]).

Tables 5–7 report results for *SALARY*, *CASH*, and *EX ANTE TOTAL* compensation, respectively. For each compensation measure, we estimate the model on our full sample without any qualification variables (cols. 1–3) and on a smaller sample for which we can construct plan qualification variables (cols. 4–6 or 4–7). The *SALARY* results in table 5 suggest that firms with predicted compensation above $1 million have slightly lower growth rates prior to section 162(m). Point estimates range from −0.5%

to −1.4% and are marginally significant in most of the specifications.[35] The results for the post–section 162(m) differential effect are more mixed. In most specifications, the estimated difference is small and indistinguishable from zero. An interesting exception is the variant reported in column 6, which includes controls for whether the firm qualified its stock plan for section 162(m) exemption. The results suggest that *AFFECTED* firms that have not qualified plans for section 162(m) exemption have substantially lower salary growth rates, all else equal, at −4.5% (standard error, 2.4%). Stock plan qualification is itself associated with higher *SALARY* growth rates (5.9%, standard error 3.0%), suggesting that firms with qualified stock options plans tend to be more generous in awarding *SALARY* increases. We have experimented with models that control for bonus plan qualification, either in place of or in addition to stock options plan qualification. Estimated bonus plan qualification effects are very noisy and add little to the explanatory power of the model. This is a somewhat unexpected finding and one that persists across our different compensation measures. We therefore return to an analysis of qualification effects following the discussion of results for table 7. Finally, the control variables for size and performance suggest small-scale elasticities (on the order of 4%) and virtually no performance sensitivity, as we might expect for *SALARY*.

Table 6 reports corresponding results for *CASH* compensation. *AFFECTED* firms do not exhibit differential *CASH* compensation growth rates prior to section 162(m), and the results in most specifications suggest little difference following section 162(m). Again, the notable exception is the specification that controls for stock plan qualification, reported in column 7. *AFFECTED* firms without qualified stock options plans seem to experience lower growth rates of *CASH* compensation, at −13.6% (9.5%), all else equal. Stock plan qualification is associated with higher growth rates (16.5%, standard error 11%, for unaffected firms, and just slightly lower on net for *AFFECTED* firms). Unfortunately, these point estimates are all relatively imprecise and can be signed away from zero only at 10%–15% confidence levels. As in the *SALARY* regressions, bonus plan qualification effects are so imprecisely estimated that they cannot be signed away from zero at any conventional levels of significance. The results for the control variables generally conform to those in the literature, with estimated sales elasticities of compensation on the order of 15%–20% and significant per-

[35] This is about one order of magnitude smaller than the growth rate effect found by Hall and Liebman (2000). Although we cannot exactly replicate their result, analysis suggests that our change in the definition of *AFFECTED* is the single most important factor in explaining this difference (reducing the coefficient on *AFFECTED* by more than two-thirds and the coefficient on *AFFECTED* × *SEC162*(*m*) by one-half, relative to the Hall and Liebman results). Compensation equation specification changes account for most of the remaining differences.

Table 6
1993–97 *CASH* Compensation First-Difference Regressions

	Full Sample			Qualification Sample			
	Robust	IV (Robust SE)	Weighted IV	Robust	Weighted IV	Weighted IV	Weighted IV
Δln(*SALES*)	.161*	.154*	.159*	.202*	.203*	.203*	.213*
	(.012)	(.027)	(.012)	(.019)	(.019)	(.020)	(.024)
Δ*MARKET RETURN*	.070*	.093*	.070*	.099*	.099*	.100*	.108*
	(.005)	(.009)	(.004)	(.007)	(.007)	(.008)	(.011)
Δ*RETURN ON ASSETS*	.813*	.811*	.805*	1.651*	1.661*	1.704*	1.827*
	(.039)	(.111)	(.043)	(.065)	(.078)	(.099)	(.144)
AFFECTED	.014	.036	.022	.0003	−.0002	−.007	−.002
	(.011)	(.025)	(.016)	(.015)	(.021)	(.023)	(.026)
AFFECTED × *SEC162*(*m*)	−.003	−.054*	−.003	−.007	−.013	−.060	−.146
	(.013)	(.029)	(.018)	(.016)	(.024)	(.061)	(.091)
QUALIFIED BONUS PLAN	. . .	. . .	. . .	. . .	. . .	−.063	. . .
						(.131)	
QUALIFIED BONUS × *AFFECTED*	. . .	. . .	. . .	. . .	. . .	.133	. . .
						(.143)	
QUALIFIED STOCK PLAN	. . .	. . .	. . .	. . .	. . .	. . .	.153
							(.109)
QUALIFIED STOCK × *AFFECTED*	. . .	. . .	. . .	. . .	. . .	. . .	.112
							(.080)
N	5,319	5,319	4,445	2,888	2,419	2,419	2,419

NOTE.—Dependent variable is Δln(*CASH*). All regressions include year fixed effects. Robust, IV, and weighted IV are estimation methods. Standard errors (robust SE where noted) in parentheses. Robust regressions use *PREDICTED AFFECTED*. Weighted IV regressions use *PREDICTED AFFECTED*, *PREDICTED QUALIFIED STOCK*, and *PREDICTED QUALIFIED BONUS* as instruments for *ACTUAL AFFECTED*, *QUALIFIED STOCK*, and *QUALIFIED BONUS*, and weights from the corresponding robust regressions.

* Significant at the .10 level or below.

formance sensitivities (semielasticities around 0.10 [0.01] for market return and 0.81 [.04] to 1.83 [0.14] for return on assets).

TOTAL COMPENSATION results, reported in table 7, tell a story similar to the other compensation results. *TOTAL COMPENSATION* growth rates do not appear to differ for *AFFECTED* firms, except in regressions that control for stock options plan qualification (see col. 7). *AFFECTED* firms without qualified stock options plans experience substantially lower growth in *TOTAL COMPENSATION*. The point estimate of −.29 (.16), or about −25%, has a probability value of .07. Stock options plan qualification is associated with much higher growth rates (36%, standard error 22%) for unaffected firms; the overall growth rate is somewhat lower than but statistically indistinguishable from this for affected firms that qualify stock options plans (sum the coefficients on *AFFECTED*, *AFFECTED* × *SEC162*(*m*), *QUALIFIED*, and *QUALIFIED* × *AFFECTED*). Again, the control variables for size and performance yield results generally consistent with the literature. Estimated sales elasticities of compensation are much larger than those for *SALARY* or *CASH* measures, at 28% (3%) to 46% (6%), while the performance semielasticities are comparable to (for *MARKET RETURN*) or somewhat smaller than (for *RETURN ON ASSETS*) those in the *CASH* compensation regressions.

The pattern of results for the specifications that control for compensation plan qualification raises questions of interpretation. Systematically lower growth rates for *AFFECTED* firms that do not qualify compensation for exemption from section 162(m) limits seem consistent with expected effects. Since nonqualified compensation above $1 million has a higher after-tax cost to the firm, we might expect it to grow less fast, all else equal. This effect seems to be erased by plan qualification, which restores compensation to its original, lower, after-tax cost. This explanation seems most persuasive for the *TOTAL COMPENSATION* regressions, although the point estimates for the growth rate effects are quite large (25%–30% per year). Stock options plan qualification ensures deductibility of options-based pay, which is on average approximately 25% of *EX ANTE TOTAL* compensation in our sample. It would not be surprising to see higher compensation at firms that qualify options plans than at those that do not.

It is more difficult to match this explanation to the *SALARY* and *CASH* results, however. Stock options plan qualification does not itself alter the after-tax cost of either salary or cash compensation. If changes in after-tax costs drive compensation choice, we would expect bonus plan rather than stock options plan qualification to have a direct influence on *SALARY* and *CASH* growth rates. Our analysis of the data suggests no evidence of this. Moreover, if firms prefer tax-advantaged forms of compensation, we might expect stock options qualification to induce a shift away from higher-cost salary and bonus toward options-based pay. This

Table 7
1993–97 *EX ANTE TOTAL* Compensation First-Difference Regressions

	Full Sample			Qualification Sample			
	Robust	IV (Robust SE)	Weighted IV	Robust	Weighted IV	Weighted IV	Weighted IV
Δln(*SALES*)	.285*	.270*	.282*	.444*	.435*	.442*	.464*
	(.028)	(.050)	(.028)	(.044)	(.045)	(.048)	(.057)
Δ*MARKET RETURN*	.089*	.100*	.089*	.118*	.117*	.121*	.143*
	(.011)	(.021)	(.010)	(.017)	(.016)	(.018)	(.024)
Δ*RETURN ON ASSETS*	.682*	.410*	.660*	.801*	.772*	.957*	1.242*
	(.092)	(.209)	(.093)	(.148)	(.156)	(.220)	(.297)
AFFECTED	.027	−.002	.045	.004	.009	−.018	−.014
	(.027)	(.062)	(.040)	(.035)	(.050)	(.059)	(.065)
AFFECTED × *SEC162*(*m*)	.002	.037	.004	.015	.025	−.137	−.286*
	(.003)	(.069)	(.044)	(.038)	(.055)	(.136)	(.162)
QUALIFIED BONUS PLAN	. . .	. . .	. . .	. . .	. . .	.035	. . .
						(.315)	
QUALIFIED BONUS × *AFFECTED*	. . .	. . .	. . .	. . .	. . .	.278	. . .
						(.339)	
QUALIFIED STOCK PLAN	. . .	. . .	. . .	. . .	. . .	. . .	.307
							(.199)
QUALIFIED STOCK × *AFFECTED*	. . .	. . .	. . .	. . .	. . .	. . .	.317*
							(.165)
N	4,966	4,966	4,107	2,735	2,236	2,236	2,236

NOTE.—Dependent variable is Δln(*TOTAL COMPENSATION*). All regressions include year fixed effects. Robust, IV, and weighted IV are estimation methods. Standard errors (robust SE where noted) in parentheses. Robust regressions use *PREDICTED AFFECTED*. Weighted IV regressions use *PREDICTED AFFECTED*, *PREDICTED QUALIFIED STOCK*, and *PREDICTED QUALIFIED BONUS* as instruments for *ACTUAL AFFECTED*, *QUALIFIED STOCK*, and *QUALIFIED BONUS* and weights from the corresponding robust regressions.

* Significant at the .10 level or below.

would imply a negative stock options qualification effect for *AFFECTED* firms in the *SALARY* and *CASH* regressions. While the imprecision of the qualification coefficients limits the confidence with which we can sign their effects away from zero, the point estimates all suggest that this is the opposite of what we observe in the data.[36]

One explanation that would be consistent with the observed pattern of point estimates is that qualification and compensation growth reductions are alternative means of responding to political pressures on executive compensation. If qualifying a compensation plan for section 162(m) exemption signals that a company is committed to some type of performance-based pay and relaxes political pressures on executive pay, companies that qualify plans may be able to pay higher compensation than those that do not. *AFFECTED* firms that do not qualify a compensation plan may respond to these pressures by reducing the growth rate of their compensation. This would tend to generate negative coefficients on the *AFFECTED* × *SEC162*(*m*) interaction and positive coefficients for the qualification variables, which is the pattern we observe across tables 5–7. Unfortunately, the imprecision of the point estimates for these coefficients sharply limits our confidence in affirming this interpretation.

Our final set of results analyzes possible section 162(m) impacts on the performance sensitivity of compensation, an issue explored in great depth by Perry and Zenner (2001). We use only *CASH* and *TOTAL COMPENSATION*, given the very limited responsiveness of *SALARY* to performance variation in the basic compensation model. Table 8 reports results for first-difference compensation equations that allow the coefficients on accounting and stock market returns to vary with *SEC162*(*m*) and *AFFECTED* status, as in equation (2). These results are broadly representative of other flexible specifications, including those that allow the performance sensitivity to depend upon qualification decisions as well as *AFFECTED* status, as in equation (4). It is, in general, difficult to pin down significant performance sensitivity interaction terms.[37] In both regressions reported in table 8, *AFFECTED* firms seem to exhibit significantly greater performance sensitivity to both market and accounting returns than do unaffected firms.[38] However,

[36] We have explored models of compensation composition (*SALARY/CASH*, *CASH/TOTAL*, and *OPTIONS/TOTAL*), using specifications similar to those for the compensation level regressions, to investigate this hypothesis directly. It proved difficult to identify determinants of composition measures with any reasonable degree of precision, thus shedding little additional light on how to interpret the qualification results in tables 5–7.

[37] The data were wholly unable to identify *QUALIFIED* interactions, as specified in eq. (4). Both coefficients and standard errors were pushed far from zero.

[38] Perry and Zenner (2001) do not estimate a separate slope effect for *AFFECTED* firms. Any difference in performance sensitivities for these firms is therefore forced through their *post-1993* × *MILLION* interaction terms. Their compensation levels regressions estimate positive coefficients for interaction terms

Table 8
1993–97 Compensation First-Difference Instrumental Variable Regressions, Differential Performance-Sensitivity Specification

Variable	Δln(*CASH*)	Δln(*EX ANTE TOTAL*)
Δln(*SALES*)	.218*	.437*
	(.029)	(.067)
Δ*MARKET RETURN*	.045	−.108
	(.029)	(.075)
Δ*MARKET RETURN* × *SEC162*(*m*)	.017	.126
	(.037)	(.089)
Δ*MARKET RETURN* × *AFFECTED*	.212*	.722*
	(.074)	(.207)
Δ*MARKET RETURN* × *SEC162*(*m*) × *AFFECTED*	−.099	−.442*
	(.087)	(.222)
Δ*RETURN ON ASSETS*	.664*	.275
	(.232)	(.620)
Δ*RETURN ON ASSETS* × *SEC162*(*m*)	−.183	.665
	(.372)	(.820)
Δ*RETURN ON ASSETS* × *AFFECTED*	3.625*	11.482*
	(.837)	(3.670)
Δ*RETURN ON ASSETS* × *SEC162*(*m*) × *AFFECTED*	−.319	−10.429*
	(1.178)	(3.838)
AFFECTED	−.010	−.008
	(.031)	(.071)
AFFECTED × *SEC162*(*m*)	−.212*	−.341*
	(.123)	(.193)
QUALIFIED STOCK PLAN	.209	.343
	(.142)	(.227)
QUALIFIED STOCK PLAN × *AFFECTED*	.152	.329*
	(.103)	(.184)
N	2,420	2,239

NOTE.—Standard errors are in parentheses. Regressions use *PREDICTED AFFECTED* and *PREDICTED QUALIFIED STOCK* as instruments for *ACTUAL AFFECTED* and *QUALIFIED STOCK* and interaction terms of *PREDICTED AFFECTED* and *PREDICTED QUALIFIED STOCK* with the exogenous variables as instruments for the *AFFECTED* and *QUALIFIED STOCK* interaction terms.
* Significant at .10 level or below.

the results for the *AFFECTED* × *SEC162*(*m*) interaction suggests that the imposition of section 162(m) dampens this performance sensitivity. For *TOTAL COMPENSATION* regressions, this effect is both statistically and economically significant, almost completely offsetting the base-period impact of *AFFECTED* for accounting returns. A reduction in performance sensitivity of executive pay seems counter to the intent of section 162(m), although it could be consistent with decisions to reduce formulaic pay variability in response to reduced board discretion in compensation awards. While the imprecision of these results limits the strength of any conclusions

with current and lagged holding period returns but negative coefficients for seven of the 12 estimated interaction terms with current and lagged earnings per share (see their table 6).

one might wish to draw, they cast doubt on suggestions that section 162(m) significantly increased pay-for-performance sensitivities.

IV. Conclusions

Section 162(m) represented the first broadscale attempt to regulate specific components of executive compensation arrangements apart from disclosure requirements. As we emphasize in Sections I and II of this article, identifying its effect is complicated by its heterogeneous impact across firms, the limited span of available pre–section 162(m) data, and the difficulties inherent in constructing an appropriate counterfactual. Our analysis provides suggestive evidence that section 162(m)'s limit on the deductibility of executive pay may have induced firms near the $1 million cap to restrain their salary increases. We find some support for this in the empirical distribution of salary post–section 162(m), as well as in regression analysis that indicates lower salary levels and possibly lower salary growth rates for firms likely to be affected by the compensation deductibility cap. Effects on broader compensation measures are less obvious, and the interpretation of results for *CASH* and *EX ANTE TOTAL* compensation may well depend as much upon one's priors of the likely effect as on the coefficient estimates themselves.

These conclusions are much less strong than those of other studies, most notably Hall and Liebman (2000) and Perry and Zenner (2001). Attempts to reconcile our results with theirs suggest that the differences are attributable to a combination of different definitions for *AFFECTED*, different compensation equation specifications, and different samples. We have been struck during our analysis of these data by the relative fragility of apparent section 162(m) effects to even modest specification or sample changes. Moreover, we have been unable to identify systematic patterns to account for the variability of the results. While our statistical techniques are not structured to "prove" a null effect, the lack of robust results may be an indication that section 162(m) has had relatively little real impact on overall compensation. This conclusion is consistent with the views expressed by many compensation consultants and corporate directors we have consulted (see also Lublin 1994). It may reflect the political process's eventual dilution of Clinton's proposals to limit pay or the difficulty those outside the firm face in efforts to alter internal compensation decisions. Our results suggest that corporate pay may be more insulated from this type of blunt political pressure than it is from more direct pressure brought to bear at the individual firm level by stakeholder groups (Johnson et al. 1997) or through the regulatory process (Joskow et al. 1996 and the references therein).

Appendix

Variable Definitions and Data Sources

The data used in this article were collected from three main sources: Standard & Poor's (S&P) ExecuComp and Compustat databases and Executive Compensation Reports data on firm compensation plan responses to section 162(m). We supplemented these sources with data from the annual compensation surveys in *Forbes* magazine and with information from firms' proxy statements. We describe our data construction and variable definitions below.

I. Compensation Data

The primary source of CEO compensation data is the June 1998 version of the S&P ExecuComp database. This database follows the 1,500 firms in the S&P 500, Midcap, and Smallcap indices and contains information on the five highest-paid executives for 1,837 unique CUSIP identifiers. We supplement this with information from the June 1997 version of ExecuComp, which adds an additional 681 observations that were dropped in the June 1998 version of ExecuComp. We devote considerable attention to ensuring that the reported compensation in ExecuComp actually corresponds to the CEO in a given year. The 1997 ExecuComp data set we worked with recorded as "CEO" the individual who was CEO in 1997 and listed his position as CEO for as many earlier data years as he had been employed by the firm, regardless of his position during those years. The creation of an "as-reported CEO" variable (*ceoann*) in the June 1998 version of ExecuComp corrected many, but not all, assignment errors. We used ExecuComp information on dates an individual became CEO or left the CEO position to fill in missing CEO identifiers for 1,630 company years. We relied on tenure information in ExecuComp, *Forbes*, and proxy statements to delete individuals recorded as "CEO" during years prior to their appointment to that position.

To ensure compensation comparability across observations and over time, we deleted "partial year" observations, in which compensation was reported for CEOs who had held office for less than 50 weeks of a given year. Substantial payments to new CEOs may be exempt from the cap, and CEOs who retire during a compensation year are less likely to hit the cap, as it applies to the actual, not prorated, amount paid during a year. If we rescaled partial year compensation to an annual basis, we would have a misleading indication of the firm's tax liability, and if we did not, we would obtain misleading estimates on the coefficients on other correlates with CEO pay. We therefore drop these observations from our analysis.

We additionally removed observations for companies identified as appointing co-CEOs to the top management position and those with CEOs who were paid through a management service contract to a parent company or any other management service company (typically owned by one or more of the largest shareholders in the corporation). Recorded CEO compensation for these observations is unlikely to be generated by the

same function that applies to standard employment relationships. After removing observations missing data on *CASH* compensation, *SALES*, or *MARKET RETURN*, we were left with a data set of 6,976 observations on 1,792 companies over 1993–97.

II. Compensation Measures

The analysis uses a variety of compensation measures. *SALARY* measures the ex ante fixed portion of compensation, *BONUS* reflects short-term bonus payments, and *CASH* is the sum of *SALARY* and *BONUS* (following ExecuComp conventions). Total compensation includes *CASH*, other annual noncash compensation, long-term incentive payments, restricted stock grants, stock options, and all other compensation. *EX ANTE TOTAL* compensation uses ExecuComp's Black-Scholes option value at the grant date for options. *EX POST TOTAL* compensation measures total compensation using the net value of options if and when they are exercised.

CASH and *EX POST TOTAL* compensation were generally reported on proxy statements prior to 1993. The SEC proxy disclosure changes that took effect in late 1993 required companies to report salary and bonus separately, as well as more detailed options information. Thus, while *CASH* compensation data are available over the entire period, *SALARY*, *BONUS*, and *EX ANTE TOTAL* data begin with 1993 proxy statements. Some earlier salary and ex ante total compensation measures can be constructed from 1993 proxy statements' 3-year summary compensation tables for CEOs with positive tenure in 1993.

Base cash compensation.—We use 1991 *CASH* compensation as our measure of pre–section 162(m) base cash compensation, where available. Our primary source for this variable is ExecuComp, supplemented by 1990–92 data from the *Forbes* annual compensation surveys, which cover about 800 firms annually, and proxy statements. If 1991 data are not available, we use either 1992 or 1990 *CASH* compensation data. These data were available for 1,393 firms in our database, accounting for 5,764 of the firm-year observations over 1993–97.

PREDICTED AFFECTED.—We construct predicted compensation from firms' base-year *CASH* compensation and the aggregate mean compensation escalation rates for each year. Predictions are constructed from a 1993–97 regression of the form

$$\ln(CASH_{it}) = \tau_{0s} \times \ln(BASE\ COMPENSATION_{is}) + \delta_t,$$

where i denotes firm, t denotes data year (1993–97), s denotes the year in which *BASE COMPENSATION* for firm i is observed (1991, 1992, or 1990), τ_{0s} is the escalation coefficient for base year s, and δ_t is the escalation coefficient for year t. The predicted value of *CASH* compensation, given our implicit assumption of lognormality, is $E(CASH_{it}) = \exp(\tau_{0s} \times \ln(BASE\ COMPENSATION_{is}) + \delta_t + .5\sigma^2)$. *AFFECTED* is defined to be one for those firm-years in which predicted *CASH* compensation is greater than or equal to $1 million. This measure is intended to

reflect when and which companies are likely to be affected by the $1 million deductibility limit on executive pay in the absence of any specific compensation response on their part. Given nondecreasing aggregate compensation growth rates in our sample, this method implies that once a firm is predicted to reach the $1 million threshold, *AFFECTED* is set equal to one and will remain one thereafter.

EXCESS.—We define excess compensation as $\max(0, E[CASH] - \$1 \text{ million})$.

TOP5.—For observations in the June 1998 ExecuComp database, we also constructed an indicator of whether the firm was affected based on compensation for the five highest-paid executive officers of the corporation in each year (*TOP5 AFFECTED*) and the sum of the predicted cash compensation paid to each top-five executive in excess of $1 million (*TOP5 EXCESS*). These measures were constructed in a similar fashion to *AFFECTED* and *EXCESS*, except that predicted compensation regressions were estimated for each pay rank (first through fifth highest-paid executives), then aggregated as appropriate.

III. Firm Characteristics

We use firm financial information from ExecuComp where available. *SALES* is total revenues for the firm; *MARKET RETURN* is the total return to shareholders (dividend plus capital gains). We supplement financial information with data from the Compustat database where required. *RETURN ON ASSETS* is defined as net income before extraordinary items and depreciation divided by total assets. Information on federal tax payments, used to construct the *NO TAX* variable used to predict qualification decisions, is from Compustat.

Industry codes.—We include controls for 21 different industry groups in the models estimating compensation plan qualification. These are defined as groups of similar two-digit standard industrial classification (SIC) code industries (see Rose and Wolfram 2000*b*, p. 26).

TURNOVER.—CEO *TURNOVER* is one for firm-years in which the CEO is "likely" to leave within the following 3 years. "Likely" is defined as having a CEO aged 62 or more in the current year or having actual CEO turnover within the three years following the current year. Age is taken from ExecuComp and supplemented or corrected where possible with information from *Forbes*, firms' proxy statements, and references to various editions of *Who's Who*.

SEC162(*m*).—Section 162(m) became effective with 1994 pay for firms with a December 31 fiscal year end and with fiscal 1995 pay for all other firms. Standard & Poor's, our primary source for compensation and corporate financial information, records year as (fiscal year − 1) for firms with fiscal years ending January through May. This implies that the effective date for firms with fiscal years ending in December or in January through May is data year 1994. For companies with June through November fiscal year ends, section 162(m) takes effect with data year 1995. Although compensation paid under binding contracts signed prior

to February 1993 was exempt from the section 162(m) provisions for the term of those contracts, and companies operated under a variety of other transition rules during 1994 and 1995, we cannot identify firms operating under these conditions and therefore must ignore these possible exceptions.

IV. Section 162(m) Compensation Plan Responses

Qualification decisions.—We obtained information on firms' compliance actions from Executive Compensation Reports, a corporate compensation research firm. They provide a database, ECRInfo, based on proxy statements from roughly 1,200 firms, though not a proper subset of those followed by ExecuComp. Our data records the year in which firms indicate a shareholder vote to qualify bonus, long-term incentive, and/or stock options compensation plans for section 162(m) exemption.

Predicted qualification decisions.—We use the hazard model described in equation (3) and the reported estimates in table 2 to construct the predicted probability of qualifying each component of the compensation package for section 162(m) exemption by year t. This is measured by the predicted value of the cumulative distribution function, $F_i(t)$, of qualification years evaluated for firm i at year t. $F_i(t)$ is set equal to 0 for years prior to 1994, the first possible qualification year. For later years, $F_i(t)$ is the sum of the estimated densities, $f_i(s)$, for all years s from 1994 until t, where $f_i(s)$ is a transformation of the estimated hazard rates through year s (see Greene 1993, chap. 22). For companies that are missing an observation in some year s, we use the mean probability of qualifying in year s over all nonmissing firms, $f(s)$, in place of the missing density. Our results are not sensitive to this interpolation.

Deferred compensation.—ECRInfo records years in which a firm's proxy statement indicates that executives have deferred compensation in response to section 162(m) deductibility limits. We used the text recorded by ECRInfo to determine whether the deferral is in fact a response to section 162(m) limits on tax-deductible compensation. When there was ambiguity, we consulted the proxy statement to make a final determination. If ECRInfo indicated a deferral in one year but not in an adjacent year with equivalent compensation liability, we consulted the proxy to confirm the deferral status in the nonreported year or update the deferral variable as appropriate.

V. Variable List and Descriptions

Variables referenced in the text and tables, with units or possible values in parentheses and their data sources indicated, are listed below.

A. Compensation

$SALARY_t$: Base salary earned in year t (thousands of dollars). Source: ExecuComp.

$CASH_t$: Cash compensation in year t, measured by salary and bonus (thousands of dollars). Source: ExecuComp.

EX ANTE TOTAL$_t$: Total compensation in year *t*, including salary and bonus, other annual compensation, total value of restricted stock granted, long-term incentive payments, the Black-Scholes valuation of options grants in year *t*, and all other compensation (thousands of dollars). Source: ExecuComp.

EX POST TOTAL$_t$: Total compensation in year *t*, including salary and bonus, other annual compensation, total value of restricted stock granted, long-term incentive payments, net value of options exercised, and all other compensation (thousands of dollars). Source: ExecuComp.

B. Section 162(m) Policy

ACTUAL AFFECTED$_t$: Equals one if actual *CASH* compensation in year *t* is equal to or greater than \$1 million, otherwise zero (0,1). Source: ExecuComp.

PREDICTED AFFECTED$_t$: Equals one if predicted *CASH* compensation in year *t* is equal to or greater than \$1 million, otherwise zero (0,1). Source: Regression estimates described in the appendix.

AS IF AFFECTED$_\tau$: Equals one if predicted *CASH* compensation in year *t*, $t \in [1985, 1990]$, is equal to or greater than \$850,000, otherwise zero (0,1). Source: Regression estimates as described in the appendix, using 1980–90 *Forbes* compensation data.

SEC162(m)$_t$: Equals one if compensation in year *t* is subject to the section 162(m) deductibility limits, otherwise zero (0,1). Source: Authors' calculations.

QUALIFIED BONUS$_t$: Equals one if a company took the necessary steps to qualify its bonus plan prior to or in year *t*, otherwise zero. Equals zero in all other cases (0,1). Source: ECRInfo.

QUALIFIED STOCK$_t$: Equals one if a company took the necessary steps to qualify its stock plan prior to or in year *t*, otherwise zero (0,1). Source: ECRInfo.

QUALIFIED LTIP$_t$: Equals one if a company took the necessary steps to qualify its LTIP prior to or in year *t*, otherwise zero (0,1). Source: ECRInfo.

PRED QUALIFIED BONUS$_t$: Equals the predicted probability of qualifying the firm's bonus plan by year *t*. Source: Hazard model estimates in table 2.

PRED QUALIFIED LTIP$_t$: Equals the predicted probability of qualifying the firm's LTIP by year *t*. Source: Hazard model estimates in table 2.

PRED QUALIFIED STOCK$_t$: Equals the predicted probability of qualifying the firm's stock plan by year *t*. Source: Hazard model estimates in table 2.

C. Firm and CEO Characteristics

SALES$_t$: Net sales in year *t* (millions of dollars). Sources: ExecuComp and Compustat.

MARKET RETURN$_t$: Dividends and capital gains in year t divided by firm market value in year $t - 1$. Source: ExecuComp.

RETURN ON ASSETS$_t$: Net income (excluding extraordinary items) divided by total assets in year t. Source: Compustat.

NO TAX$_t$: Equals one if a company reported zero or negative federal corporate income tax payments in year t, otherwise zero (0,1). Source: Compustat.

MID FISC YEAR$_t$: Equals one if a company has a fiscal year that ends in June through November for data year 1994, otherwise zero (0,1). Source: Compustat.

TURNOVER$_t$: Equals one if the CEO is "likely" to change within the next 3 years, otherwise zero (0,1). Source: ExecuComp, supplemented by *Forbes* and proxies for age data as described in this appendix's Section III.

USED COMP TYPE$_t$: Equals one if the data record a nonzero payment in the relevant compensation category (bonus, stock options, LTIPs, or stock options and bonus) before 1994 for any of the top five executives (for companies in the June 1998 ExecuComp database) or for the CEO (for companies only in our 1997 ExecuComp supplement), otherwise zero (0,1). Source: ExecuComp.

Table A1
Descriptive Statistics (N = 5,760)

Variable	Mean	SD
SALARY ($1,000s)	570	297
CASH ($1,000s)	1,145	1,961
EX ANTE TOTAL ($1,000s)	2,719	5,661
EX POST TOTAL ($1,000s)	2,558	6,721
SALES ($1,000,000s)	3,749	9,594
MARKET RETURN	.21	.45
RETURN ON ASSETS	.04	.09
ACTUAL AFFECTED	.38	.49
PREDICTED AFFECTED	.49	.50
QUALIFIED BONUS (n = 3,725)	.24	.42
QUALIFIED LTIP (n = 3,725)	.10	.31
QUALIFIED STOCK OPTIONS (n = 3,725)	.35	.48
Qualification Hazard Model Sample (N = 3,087)		
NO TAX	.09	.28
MID FISC YEAR	.08	.27
TURNOVER	.45	.48
USED BONUS	.96	.19
USED LTIP	.28	.45
USED OPTIONS	.85	.36
PRED QUALIFIED BONUS (n = 2,453)	.32	.24
PRED QUALIFIED STOCK (n = 2,453)	.45	.24

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