# Stock Performance or Entrenchment? The Effects of Mergers and Acquisitions on CEO Compensation

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## Abstract

Using a large sample of U.S. acquiring and non-acquiring firms and covering a broad sample of transactions, we examine the effects of mergers and acquisitions (M&A) on CEO compensation during 1993-2006, a period of intense M&A activity. We alleviate endogeneity concerns through dynamic panel data estimation, propensity score matching, and using a natural experiment of exogenous accounting regulatory changes in 2001 that significantly affected the benefits of stock-financed acquisitions. The level of M&A activity ceteris paribus has a significant and positive effect on CEOs' equity-based compensation. But the positive impact of M&A on compensation occurs through primarily stock-financed deals, and there is a positive interaction in the influence of recent stock returns and M&A activity on CEO compensation. However, the usual measures of CEO entrenchment and power do not significantly enhance the effects of M&A. Our analysis supports the view that rent-seeking CEOs use strong recent performance of their firm's stock to pursue stock-financed acquisitions that also positively impact their equity-based compensation.



Keywords: Executive compensation, Mergers and Acquisitions, Entrenchment, Stock Performance

JEL classification: G30, G34, J33, M12

# 1. Introduction

The positive relation of stock market valuation to mergers and acquisitions (M&A) activity, especially stock-financed deals, is well known (e.g., Rhodes-Kropf, Robinson, and Viswanathan, 2005). In particular, starting with the bull market of the 1990s and stretching to the recent financial crisis, there was intense M&A activity, with extensive use of equity financing.[1] But whether this historically large M&A wave was consistent with shareholder value creation is a contentious issue in the literature. A benign view is that following the burst of equity-based compensation awards in the 1980s and early 1990s (Frydman and Saks, 2010) managers had incentives to pursue value-creating corporate restructuring (Datta, Iskander-Datta, and Raman, 2001; Holmstrom and Kaplan, 2001). However, Moeller, Schlingemann, and Stulz (2005) argue that acquiring firms' shareholders in fact lost substantial wealth due to the M&A activity in the 1990s; that is, managers appeared to have pursued M&A to shareholders' detriment.

The literature suggests that entrenched CEOs may engage in M&A to derive *private* (i.e., non-pecuniary) benefits of control (Jensen, 1986; Shleifer and Vishny, 1989) and that M&A activity may be driven by subjective CEO preferences (Jenter and Lewellen, 2011). There is also evidence of positive effects of M&A activity on CEO compensation. Bliss and Rosen (2001) and Harford and Li ( 2007) report that M&A activity has a greater influence on CEO compensation compared with other investments, while Grinstein and Hribar (2004) find that powerful CEOs receive M&A bonuses for completing large transactions. But can managers strategically leverage M&A successes to amplify rent extraction and increase their compensation? And, if so, what factors facilitate greater rent extraction through M&A? These issues are largely unexplored in the literature and are the focus of our paper.

However, resolving the relation of M&A activity to executive compensation poses some challenging identification issues. There is an endogeneity "problem" because M&A and executive compensation are major decisions of the firm and both presumably respond to firm- or time-specific common factors, some of which may be unobservable (or latent). In particular, the positive effects of M&A activity on executive compensation may not

[1] According to *Mergerstat Review* of 2008, from 1990 to 2000, there were 55,996 M&A announcements net of divestitures, and the total dollar value offered is $6,130 billion. In comparison, there were 18,339 net announcements and a total dollar value of $1,180 billion from 1983 to 1989. In addition, there were 64,910 net announcements and a total dollar value of $5,854 billion from 2001 to 2007.

imply causation but, rather, reflect endogenous responses to latent improvements in the quality of investment opportunities. There is also simultaneity because M&A and executive compensation are jointly determined. Finally, from a dynamic perspective, there may be reverse causation because past executive compensation awards influence current incentives for M&A.

In this paper, we examine the impact of M&A on CEO compensation during 1993-2006 (the period of the most intense recent M&A activity) using a large sample of U.S. acquiring and non-acquiring firms and covering a broad sample of transactions that include non-public and non-U.S. targets.[2] Addressing the identification problem by using a variety of panel data estimation techniques and using exogenous events—such as changes in accounting regulations that substantially alter the benefits of stock-financed acquisitions—as instrumental variables, we find that the level of M&A activity, especially the value of stock-financed deals relative to total assets, has a significant and positive effect on CEO compensation, mostly in the form of higher equity-based compensation (EBC) even after controlling for indirect effects of mergers, such as increases in firm size and stock returns. Moreover, tests using propensity score matching techniques (Hillion and Vermaelen, 2004; Michaely and Roberts, 2012) also indicate the CEO compensation of acquiring firms increases significantly compared to that of comparable non-acquiring firms.

The effects of M&A activity are economically significant: During our sample period, CEOs of firms with at least one successful deal in a given year earned over 5% (or $270,300 based on the sample average) more than CEOs in otherwise similar firms with no M&A activity during that year. More strikingly, perhaps, raising the ratio of annual deal value to total assets by 1% increases the total CEO pay that year by about 16% and the equity-based compensation (comprising of the value of stock options and restricted stock grants) by about 23%; however, the effects of M&A activity on CEOs' cash pay are substantially lower.

Our analysis highlights the strong role of recent return (or price) performance by the firm's stock in a variety of ways. Other things held fixed, both total CEO

[2] Netter, Stegemoller, and Wintoki (2011) document that using broader screening rules for M&A transactions yields results that are significantly different from those reported earlier in some of the M&A literature.

compensation and M&A activity are positively related to the firm's recent stock return. These results—that are observed using both independent (double) sorts and regressions analysis—are consistent with the CEO compensation literature (e.g., Cyert, Kang, and Kumar, 2002; Gabaix and Landier, 2008) and the recent M&A literature that emphasizes the role of stock over-valuation in driving M&A waves (Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004).

But the M&A literature on stock valuation driven M&A leaves open the issue of whether self-interested CEOs have incentives for exploiting stock misvaluation?[3] We find a significant positive interaction in the influence of recent stock returns and M&A activity on CEO compensation: The positive relation of recent stock performance and total CEO compensation is almost twice as strong for firms with the highest level of M&A *intensity* (the ratio of the annual deal value to total assets) compared with the lowest M&A intensity firms. Furthermore, apart from the direct effects of strong recent stock performance on CEO compensation (noted in the literature), there is also an indirect and dynamic effect because past CEO compensation, especially the EBC awards, provide incentives for current M&A activity (Holmstrom and Kaplan, 2001). Thus, high recent stock returns influence M&A activity through stock misvaluation effects and through their impact on past CEO compensation. Finally, we find that only deals financed mostly through the (acquiring firm's) stock significantly impact CEO compensation—that is, controlling for endogeneity, cash deals do not have a significant influence on CEO compensation. Indeed, using the passage of a major acquisitions-related accounting rule change (SFAS 141) as an instrument, we are able to document that the effects of M&A intensity on CEO compensation weakened after 2001 when the SFAS 141 made stock-based acquisitions less attractive for firms.[4]

In contrast to the powerful positive interaction of recent stock performance and M&A on CEO compensation, we find that more entrenched CEOs—for example, those with long tenures, holding dual positions as chairs of the board, and governed by relatively weak boards in firms with weak shareholder rights—are not able to amplify the

[3] For example, Rhodes-Kropf and Viswanathan (2004) assume that managers choose their M&A strategy to maximize shareholder value and not their personal expected utility.

[4] In 2001, accounting rule changes in the U.S. eliminated the pooling method (SFAS 141) and goodwill amortization (SFAS 142) that were earlier available for acquisitions financed through a stock-for-stock exchange.

effects of M&A on their compensation. Similarly, CEOs that are subject to greater free cash flow agency costs do not appear to have greater facility in leveraging M&A successes into higher compensation. Thus, somewhat surprisingly, entrenchment *per se* does not appear to be particularly effective in leveraging M&A success for compensation increases; this is consistent, in fact, with the result that such activity does not significantly increase cash pay—given the known preference of entrenched managers for non-performance-based compensation (Core, Holthausen, and Larcker, 1999; Hu and Kumar, 2004).

Our analysis pertains directly to the two principal hypotheses in the literature regarding the determination of executive compensation. The *efficiency* hypothesis views compensation being optimally designed from the perspective of shareholder value. In particular, this hypothesis posits that the marginal productivity of managerial effort and/or talent increases with size (Rosen, 1992; Gabaix and Landier, 2008) leading to a positive relationship between CEO compensation and firm size. On the other hand, the *agency* or *managerial power* hypothesis argues that rent-seeking CEOs are able to determine the level and composition of their own compensation subject to market constraints (e.g., Bebchuk and Fried, 2004).[5]

*Prima facie*, the positive relationship between M&A activity and CEO compensation is consistent with the efficiency hypothesis because M&A activity is a major driver of the asset growth of firms (e.g., Cooper, Gulen and Schill, 2008), and as we noted above, the efficiency hypothesis posits that the marginal productivity of managerial effort and talent increases with size. More generally, if M&A activity is value-creating, then it would be rewarded with higher stock returns (Holmstrom and Kaplan, 2001), which may create additional efficiency channels between M&A and CEO compensation. However, our analysis shows that the significant positive effects of M&A activity to executive compensation holds even after we control for size, stock returns, and other firm-specific productivity-related unobservable common factors that may drive M&A activity and CEO compensation. Moreover, it is not apparent why any efficiency gains—that have not been controlled for in our tests—would apply only to deals financed

[5] Weisbach (2007) and Frydman and Saks (2010) provide excellent expositions of the efficiency and managerial power hypotheses.

mostly through stock and not cash?[6] Or why the greater returns to managerial effort or talent accrue only through increases in EBC but not through cash compensation?

Meanwhile, the positive association between size and compensation is also consistent with managerial power view because larger firm size can facilitate managerial entrenchment and enhance CEO bargaining power in extracting quasi-rents from the board of directors (Cyert et al., 2002).[7] More generally, successful consummation of M&A deals may enhance CEOs' prestige and rent-extraction ability by allowing a projection of "success" in their dealings with the board. However, our results indicate that such strategic personal benefits of M&A accrue significantly only for CEOs who exploit recent run-ups in the firm's stock price—possibly driven by stock misvaluation—to effect stock-financed acquisitions and raise their equity-based compensation. In sum, stock price appreciation appears to make stock-financed acquisitions cheaper (as emphasized in the literature) but also to benefit the CEOs by facilitating larger compensation, especially awards of EBC.[8]

Our study is among the first to document that CEOs appear to strategically use recent stock price momentum (or misvaluation) to implement stock-financed mergers and acquisitions for pecuniary benefit through greater equity-based compensation. In particular, the mutually reinforcing roles of high recent stock returns and M&A activity on raising CEO compensation, especially the EBC have not been emphasized earlier, to our knowledge. And while the positive relation of recent stock returns and CEO's EBC has been noted before, the indirect dynamic effects of lagged stock returns on CEO compensation through the influence of past CEO compensation on current M&A activity has not been highlighted in the literature.

Overall, our analysis supports the view that rent-seeking CEOs strategically use M&A activity to raise the level of their equity-based compensation. However, the primary determinant for this rent-extraction appears to be recent price performance of the firm's stock and not CEO entrenchment and power per se.

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[6] This is especially the case because since cash acquisitions of public targets generate greater announcement effects compared with stock-financed deals (e.g., Fuller et al., 2002).

[7] Cyert et al. (2002) argue that larger size facilitates entrenchment ceteris paribus by raising the costs of disciplining executives through takeovers and shareholder proxy proposals.

[8] The emphasis on EBC is noteworthy because much of the rise in executive compensation since the 1980s has occurred through increased stock option awards.

We organize the paper as follows. Section 2 describes our empirical framework and identification strategy, while Section 3 describes the data and the sample construction. We present the results in Sections 4 through 6; and Section 7 concludes.

## 2. Empirical Framework

In this section, we describe our empirical framework and identification strategy for the estimating the effects of M&A activity on CEO compensation. We highlight the endogeneity issues in the relation of M&A to compensation and then describe our empirical test design and the identification strategy.

### *2.1 The Empirical Model*

Mergers and acquisitions are among the most important strategic decisions of the firm and a large literature presents a variety of motivations for them, such as operational and financial synergies, diversification, asset growth, knowledge acquisition, and stock misevaluation.[9] Meanwhile, setting executive compensation is one of the most important responsibilities of the board of directors (Black, 2000; Van Den Berghe and Levrau, 2004). And since both M&A and executive compensation are major decisions of the firm they presumably respond to firm- specific common factors, some of which may be unobservable.

Most studies in the literature have examined the effects of M&A activity on CEO compensation components through static models, i.e., where current or recent mergers and acquisitions influence the current CEO compensation. However, current M&A can be influenced by the incentive compensation design for executives in previous periods—for example, through long-term incentive plans and equity-based compensation. Similarly, executive productivity and power will generally be affected by past acquisitions.

Keeping these dynamic interrelationships and the presence of latent common factors in view, our basic empirical specification for the determination of executive compensation ($Pay$) and M&A ($Acquisition$) for firm *i* at date *t* is:

[9] Bruner (2004) and Martynova and Renneboog (2008) provide excellent summaries of this literature.

$$Pay_{it} = f(Acquisition_{it}, \dots, Acquisition_{it-r}, X_{it}, \eta_t, \alpha_i) \quad (1)$$

$$Acquisition_{it} = g\left(Pay_{it-1}, \dots Pay_{it-p}, Z_{it}, \alpha_i\right) \quad (2)$$

Here, $Z_{it}$ and $X_{it}$ are vectors of firm- and year-specific observable determinants of the M&A and compensation decisions, respectively, while $\alpha_i$ is a firm-specific common latent factor in those decisions. Furthermore, the recent literature suggests systematic or general time trends in executive compensation, especially equity-based compensation (e.g., Frydman and Saks, 2010; Graham, Li, and Qiu, 2012). Hence, we use a common time-factor $\eta_t$ in the compensation specification.

Substituting Equation (2) in Equation (1) and using a linear parameterization, we arrive at our empirical model of executive compensation, viz.,

$$Pay_{it} = \alpha_0 + \sum_{s=1}^{p} \gamma_s Pay_{it-s} + \beta Acquisition_{it} + \delta X_{it} + \theta Z_{it} + \eta_t + \alpha_i + \varepsilon_{it} \quad (3)$$

Here, $\{\alpha_0, \beta, \delta, \theta\}$ are vectors of parameters to be estimated and $\varepsilon$ is an error term.

### *2.2 Endogeneity in M&A and CEO Compensation*

There are two major sources of endogeneity in the M&A and compensation relation given in Equation (3) that need to be addressed. First, there are likely to be latent common factors, i.e., $E(\alpha_i | X_{it}, Z_{it}) \neq 0$. In particular, both the shareholder value maximization and the agency points of view suggest that M&A and executive compensation are positively correlated. Consider, for example, a firm that identifies operational synergies through a merger or develops a growth opportunity (through an innovation, for example) that can be leveraged through an acquisition. In both cases, the marginal productivity of managerial effort or the economic returns to talent are arguably amplified, indicating a higher likelihood of observing increased M&A and executive compensation. Meanwhile, taking the agency view, an entrenched manager who is able to sway the board of directors and indulge in "empire building" (presumably through higher M&A) is also likely to influence the board for a higher compensation. More generally there may also be time- or year-specific unobservable factors as well. Not addressing

these firm or year fixed effects would render a positive relation between M&A activity and CEO compensation spurious.

Second, over the course of a given year the level of the M&A activity may influence the determination of CEO compensation because of the reasons mentioned above. Conversely, CEO compensation, especially its incentive components may influence CEO motivations for M&A (cf. Holmstrom and Kaplan, 2001). Formally, $E(\varepsilon_{it}|X_{it}, Z_{it}) \neq 0$ (in the empirical model) if there is simultaneity in the determination of M&A activity and CEO compensation.

We employ three estimation approaches that help address these endogeneity issues in the M&A activity and CEO compensation relation.

### *2.3 Estimation with Firm and Year Fixed Effects*

As we will see in detail below, CEO compensation, M&A, and other firm-specific data are available in panel form. Hence, we take advantage of this structure to include firm and year fixed effects to help address the omitted variables bias due to latent or unobserved firm- and year-specific variables. That is, in the empirical model (3) we estimate the common $\eta_t$ through fixed effects for each year in the sample and estimate $\alpha_i$ through the firm-specific fixed effects.

But while the firm and year fixed effects can help address the issue of unobserved heterogeneity, it still retains the assumption that M&A activity in a given year, the primary explanatory variable for CEO compensation in our study, is exogenous with respect to (or independent of) past observations of compensation. For reasons mentioned above, this is an unappealing assumption on economic grounds. Furthermore, the fixed effects treatment does not address the simultaneity problem. To address these issues, we therefore use an alternative estimator.

### *2.4 Dynamic GMM Instrumental Variables Estimation*

By using lagged explanatory variables as instrumental variables (IVs) for the first-differenced version of the empirical model, the dynamic panel GMM estimator—based on Holtz-Eakin, Newey, and Rosen (1988) and Arellano and Bond (1991)—includes firm fixed effects but also helps address the simultaneity issue and allows dynamic interrelationships between the current explanatory variables —such as, the level of M&A

activity— and past values of the dependent variable—namely, CEO compensation.[10] To alleviate possible trade-offs in exogeneity versus weak instruments, we follow Roodman (2009) and implement a two-step system GMM estimator that augments and sometimes dramatically improves the efficiency of the Arellano and Bond (1991) identification approach (Arellano and Bover, 1995; Blundell and Bond, 1998).

Finally, for robustness of inference on the effects of M&A on executive compensation, we also examine the average executive compensation of acquiring firms with those of no-acquiring matched firms, using a version of the widely-used "comparables" technique in the literature. We describe this procedure next.

### *2.5 Propensity Score Matching Estimation (PSM)*

Theoretically, establishing causation requires comparing compensation conditional on M&A with compensation conditional on the absence of M&A, i.e., the difference:

$$E(Pay_{it}^{A} - Pay_{it}^{C} | Acquisition_{it} = 1)$$

$$= E\left(Pay_{it}^{A} \middle| Acquisition_{it} = 1\right) - E\left(Pay_{it}^{C} \middle| Acquisition_{it} = 1\right) \qquad (4)$$

where, $Pay_{it}^{A}$ and $Pay_{it}^{C}$ denote CEO compensation with and without acquisition (for firm *i* at date *t*), respectively. Of course, in a non-experimental setting, it is infeasible to contemporaneously observe both $Pay_{it}^{A}$ and $Pay_{it}^{C}$ for the same firm-year. Following the tradition of a long-standing literature, we therefore employ econometrically-based matching techniques (Heckman, Ichimura, and Todd, 1997; Kim and Ritter, 1999).

We use the PSM approach to construct the set of comparable firms for each acquiring firm-year because in conventional procedures matching on multiple firm characteristics becomes impractical as the number of variables increases ("the curse of dimensionality"). The PSM procedure reduces a multidimensional matching problem to a single-dimensional problem, and has been increasingly used in the recent literature (e.g., Hillion and Vermaelen, 2004; Michaely and Roberts, 2012).

To implement the PSM, we first identify a set of matching variables that describe the information available at the time of M&A and simultaneously explain executive

[10] More detailed discussion and other applications of this estimator are provided recently by Almeida, Campello, and Galvao (2010), Gavazza (2011) and Wintocki, Linck, and Netter (forthcoming).

compensation. We then construct a single index from these variables and this index is used to form the acquirer—non-acquirer match. That is, for each acquiring firm-year we form a portfolio of matching non-acquirers.

Specifically, we use a probit model to estimate the propensity score of M&A:

$$P(Acquisition_{it} = 1) = \Phi(X_{it-1}) \qquad (5)$$

Here, *X* is a vector of observable covariates available before the acquisitions that includes information on prior M&A and CEO pay along with past firm characteristics and time dummy variables.[11] Subsequently, we employ a matching algorithm to use the estimated propensity scores to match the non-acquirers to the acquirers. Several such matching algorithms or estimators are proposed in the literature and these differ according to their weighting functions (Blundell and Costa Dias, 2009). We employ both *nearest neighbor matching*, which assigns the same weight to the *n* closest non-acquirers to the acquirers, and *kernel matching*, which includes all non-acquirers in the sample but gives more weight to the non-acquirer with closer propensity score to the acquirer.[12]

We now specify our data sources, sample construction procedures, and empirical measures, following which we describe the results.

## 3. Data and Empirical Measures

### *3.1 Data Sources and Sample Construction*

We take our data from ExecuComp, Compustat, CRSP, and the SDC M&A database. We begin with all executives in the ExecuComp who served as CEOs of firms during 1992 to 2007. For each CEO-firm-year, we collect data on CEO compensation and governance related data, and include in our sample those firms years for which total compensation (TDC1) is available and where the CEO tenure is at least two years (to allow the implementation of the dynamic specification (3) with lagged CEO compensation). Subsequently, for those records with available TDC1 values, we collect

[11] These characteristics include firm size, ROA, stock return, investment opportunities, standard deviation of ROA, stock return volatility, governance index, industry sales growth rate, and an indicator variable for regulated industries.

[12] Additional details on the kernel matching procedure are available upon request.

firm-level financial and stock return data from Compustat and CRSP databases during 1987 and 2007.[13]

We extract M&A deal information from the SDC M&A database. Here, we require that the deals be announced, and be subsequently completed, by U.S. acquiring firms between 1991 and 2008. We include all completed deals regardless of the availability of deal value information or the nationality and the type of the targets.[14] Our sample thus includes a broader range of transactions compared with most of the M&A literature. In addition, to ensure the broadest possible coverage of M&A transactions by firms, we use two alternative definitions for M&A: the first definition includes a majority of transactions with public targets and provides relatively detailed information on deal characteristics; the second definition covers a broader set of transactions where the target can be a public or private firm or be a subsidiary of a public firm, albeit with a more restricted transaction-specific information.[15] For each acquiring firm-year, we count the number of deals and aggregate the value of deals completed by the firm's fiscal-year end date during 1992-2007. The non-acquiring firm-years are those that do not have records in the SDC database.

We then match our acquiring-firm sample with ExecuComp and CRSP, and arrive at our final sample. This sample consists of 14,205 firm-year observations for 3,322 CEO-firm combinations in 2,187 firms from 1993 to 2006. It is useful to summarize the difference between our sample construction and other studies in the literature that examine the relation of M&A activity to executive compensation (Bliss and Rosen, 2001; Grinstein and Haribar, 2004; Harford and Li, 2007).

Our sample includes transactions not considered in the previous studies. Specifically, we do not restrict M&A deals to those with disclosed transaction values greater than a percentage threshold (e.g., 10%) of the acquiring-firm size nor do we limit the transactions to those with U.S. target firms. We are, therefore, able to examine the

[13] We use a different time-range here because some of the variables are constructed by historical averages over the previous five years. Note that CRSP and SDC databases adopt a calendar year convention while Compustat and ExecuComp take a fiscal year convention. In this study, we unify the time range by converting the calendar year to the fiscal year convention.

[14] That is, we initially screen the deals by MA type code of "DD" and "UD".

[15] These alternative definitions are based on SDC's classification (i.e., FORMC). The first definition takes FORMC equaling to M (Merger) and A (Acquisition) while the second with FORMC of M, A, and AA (Acquisition of Assets).

relation of CEO compensation to the number of deals in a given year. This examination is important since most deals recorded in SDC are with undisclosed transaction values, as pointed out by Netter et al. (2011). Additionally, from 1993-2006, it is not uncommon for a firm to make multiple deals in a short period of time (Fuller et al., 2002; Klasa and Stegemoller, 2007).[16] In sum, compared with existing studies, our analysis uses a much larger panel dataset (14,205 firm-years), covers a longer period (1993-2006), and includes a broader set of M&A transactions.

### *3.2 Variables*

In this subsection we describe the covariates used in our empirical tests. We also provide a summary of their definitions in Exhibit 1.

#### *3.2.1 CEO Compensation*

We consider three measures of *Pay* for our compensation equation (Eq. (1)). *Totalpay* is the fiscal-year end balance as reported in S&P's ExecuComp, which is the sum of salary, bonus, non-equity incentive plan compensation, grant-date fair value of stock and option awards, deferred compensation earnings reported as compensation, and other compensation. *Cashpay* measures the fixed component of the compensation package, and is equal to salary plus bonus. *Equitypay* measures the performance-related incentives given to the CEO of a firm in a given year, and is composed of the restricted stock and option awards evaluated at the grant-date fair values.

#### *3.2.2 M&A*

We use four measures of M&A. *Acquisition(active)* indicates, through a dummy variable, whether a firm in a given year completes at least one acquisition transaction; *Acquisition(number)* denotes the number of deals a firm has completed in a given year; *Acquisition(amount)* measures the total dollar value of M&A deals completed in a given firm-year; finally, *Acquisition(intensity)* measures the total dollar value of completed

[16] Our sample shows that firms engaging in more than one acquisition in a year consist of 20.52% of the acquiring firm-years. This evidence is consistent with Fuller et al. (2002). They document that during 1990-2000, serial acquirers make more than one-third of all the large, nonfinancial, nonutility takeovers in the United States.

deals normalized by total assets of the firm.[17] But, as we mentioned above, we also use transactions data by employing alternative and broader definitions of M&A. We refer to these alternative measures by *Acquisition(active)—alt* etc.

### *3.2.3 Control Variables*

As control variables, we include the major determinants of CEO compensation that are identified in the literature and we describe these below.

*Firm size:* As noted above, the positive pay-size relation is well-documented. Firm size may contain information related to compensation beyond the asset expansion due to M&A. For example, size may proxy for managerial ability (Gabaix and Landier, 2008; Tervio, 2008; Baranchuk, et al., 2011) and is used as a main benchmark by compensation consultants in determining their recommendations on CEO compensation to board (e.g., Bizjak, Lemmon, and Naveen, 2008). We measure firm size by the fiscal-year end market capitalization and include both the current and prior year values.

*Investment opportunities:* The quality of a firm's investment opportunity set should influence both the size and incentive-composition of CEO compensation (Smith and Watts, 1992; Core, Holthausen, and Larcker, 1999). We proxy the quality of investment opportunities by using principal components to generate a factor score for each firm-year. The score is constructed from investment intensity, geometric growth rate of assets, market-to-book ratio, and the ratio of R&D expenses to assets (Baber, Janakiraman, and Kang, 1996).[18]

*Firm performance:* The effects of firm performance on CEO compensation are implicated by both the efficiency wage and agency theories (e.g., Jensen and Murphy, 1990; Core et al., 1999). We measure firm performance by the return on assets and the annual stock return of a firm in the current and the prior year.

*Firm risk:* The standard option-theoretic argument suggests that equity-based compensation may increase with firm risk. We employ both the standard deviation of a

[17] Because of missing information on deal values, especially for transactions with private or overseas targets, the deal value measures are likely to be biased toward larger deals with U.S. public targets.
[18] See Baber, Janakiraman, and Kang (1996) for details on the construction of this score.

firm's return on assets over the prior five years and the annualized standard deviation of a firm's monthly stock return over the previous 60 months as proxy for firm risk.

*Corporate governance:* Agency-theoretic models emphasize the role of the strength of firms' internal and external governance mechanisms for the determination of CEO compensation (Cyert et al, 2002; Bebchuk and Fried, 2004). In general, the stronger is the CEO's bargaining power or the weaker is the strength of corporate governance the higher is the level of CEO compensation. We include three measures of the strength of corporate governance that are widely used in the literature. First, we use CEO tenure, which is argued to be positively related to CEO power (Finkelstein and Hambrick, 1989) and moral hazard (Murphy, 1999); second, we identify firms where the CEO is also the chairperson of the board, which arguably diminishes the independence and effectiveness of the board and increases CEO power (Jensen, 1993; Boyd, 1994); and, third, we employ the entrenchment index (E-index) constructed by Bebchuk, Cohen, and Ferrell (2009) that includes six anti-takeover provisions that arguably enhance managerial entrenchment and ceteris paribus lower firm value.[19]

*Industry growth rate:* In their compensation model, Baranchuk et al. (2011) predict that industry demand is positively related to both the level of CEO compensation and the relationship between pay and firm size. We measure the growth in industry demand by the industry sales growth rate, which is taken from the median sales growth rate of all firms in a given industry-year; here we use the Fama and French (1997) definition of 48 industries to categorize firms.

### *3.3 Sample M&A*

We now present some salient aspects of M&A by sample firms.

#### *3.3.1 Deal Frequency*

Panel A of Table 1 shows that there is at least M&A transaction in about 12% of firm-years; in these firm-years, the average acquirer completes 1.4 deals per year. The

[19] These six provisions are: staggered boards, limits to shareholder bylaw amendments, poison pills, golden parachutes, and supermajority requirements for mergers and charter amendments. They are extracted from the twenty-four provisions followed by the Investor Responsibility Research Center (IRRC). We obtain the data from Lucian Bebchuk's website and follow the method outlined in Bebchuk et al. (2009) for filling in firm-years with missing data.

average aggregate transaction value is $1.52 billion per acquiring firm-year. However, when we use the alternative or broader definition for M&A, approximately 26% of firms-years have at least one acquisition deal, with an average of 2.1 deals and aggregate deal value of $0.95 billion per acquiring firm-year.

### *3.3.2 M&A Over Time*

Panel B of Table 1 shows M&A from 1993 to 2006. Takeover activities tend to be cyclical, with peaks occurring in 1997-2000 and again in 2004-2006. Moreover, it is not uncommon to have firms undertaking multiple acquisitions in a given year: on average, about a quarter of acquiring firms transact more than one deal per year, which is consistent with previous studies (Fuller et al., 2002). There is also evidence that M&A was more intense during the 1997-2000 peak period compared with 2004-2006, looking for example at the median aggregate transaction values per year.

### *3.3.3 M&A Across Industries*

Panel C of Table 1 presents M&A activities across industries during 1993-2006. For ease of presentation, we report the data based on a 10-industry classification (with the industry definitions provided in panel D).[20] There is significant inter-industry variation in M&A., with utilities (hi-tech) industry having the lowest (highest) ratio of acquiring firms to total number of firms (in the industry). Utilities also have the lowest ratio of acquirers with multiple deals in a given year. In terms of deal values, the lowest mean (median) aggregate transaction value per acquirer is in the durables industry, while the largest is in the telecommunication industry.

## *3.4 Summary Statistics*

In this section, we present descriptive statistics on salient firm characteristics and CEO compensation and then perform a univariate comparison for the characteristics of acquiring versus non-acquiring firms.

### *3.4.1 CEO Compensation and Firm Characteristics*

[20] This classification is adopted from the one provided in Kenneth French's website. Please see: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/det_10_ind_port.html.

Panel A of Table 2 shows that the mean (median) CEO compensation in our sample is total of $5.32 ($2.76) million annually. And the mean (median) cash and equity-based compensations are $1.57 ($1.10) million and $3.16 ($1.06) million, respectively. Meanwhile, the average CEO has a served for 7.8 years and in over two-thirds of the sample (67% of firm-years) the CEO also serves as the chairperson of the board.

Meanwhile, the mean (median) market capitalization of sample firms firm is $18.7 ($3.5) billion; the mean annual returns on assets and equity are 3.2% and 6.3%, respectively, while their respective annualized volatilities are 4.4% and 40.0%. We also see that on average the sample firms have at least two out of the six anti-takeover provisions (included in the E-index) in place in a given firm-year. Finally, almost one-fifth of the sample firms are in regulated industries (i.e., financial and utilities industries).

*3.4.2 Acquiring versus Non-Acquiring Firms*

Panel B of Table 2 presents means and medians of some important characteristics of the acquiring and non-acquiring firm-years in the sample; we also report the t-statistic (z-scores of the Wilcoxon rank-sum test) of the difference in mean (median) for each variable.

On average, CEOs in acquiring firms earn significantly higher total pay, cash pay, and equity-based compensation than those in non-acquiring firms. We find similar differences between firms with multiple and single acquisitions (in a given year). We also find that acquiring firms are larger and have more growth options, lower volatility of ROA and stock returns, and lower E-index, than non-acquiring firms. (These differences are statistically significant.) And we find similar differences in these firm-specific characteristics between firms with multiple and single annual acquisitions. However, we do not observe significant differences between acquiring and non-acquiring firms in terms of return performance. Finally, with regard to CEO-specific characteristics, we find that both the average CEO tenure and the proportion of CEOs who serve in dual capacity (i.e., board chair along with CEO) are significantly higher in acquiring versus non-acquiring firms.

We now turn to the implementation of our empirical test design, described in Section 2, and report the results.

# 4. Results

It is useful to first estimate the empirical model with the dynamic pooled OLS to set up a benchmark for the main tests and to better relate our results to the literature. We then report the results based on the panel estimation and PSM.

## *4.1 Dynamic Pooled OLS Regressions*

Table 3 (Panel A) gives coefficient estimates from the dynamic pooled OLS regressions of the empirical model given in Equation (3). For correct inference, we adjust the standard errors for heteroskedasticity and serial correlation (see, e.g., Wooldridge, 2002).

Column 1 gives the estimates without M&A related variables. Consistent with the literature (Core et al., 1999; Cyert et al., 2002; Harford and Li, 2007), CEO compensation is significantly and positively related to firm size, the quality of investment opportunities, return performance, risk, and industry sales growth. Moreover, ceteris paribus CEO compensation is negatively related to the strength of corporate governance: For example, CEOs who serve as the chair of the board (CEO duality) and serve on firms that rank high on the E-index receive significantly higher compensation, other things held fixed. The influence of CEO tenure on total compensation is insignificant but as we will see shortly this is because of the asymmetric effects of tenure on cash pay versus the EBC.

The results in Columns 2—5 indicate that M&A activities have a significant and positive influence on total CEO compensation, using all four measures for M&A. For instance, Column 5 shows that CEOs in acquiring firms earn, on average, 5.1% (or $270,300 based on the mean CEO compensation of $5.3 million) higher than CEOs in non-acquiring firms, holding other things fixed, and Column 4 indicates that each additional completed deal raises CEO compensation by 3.1%. Similarly, Column 2 indicates that a 1% increase in the total (dollar) value of completed acquisition deals in a given year is associated with approximately 1.2% higher total CEO pay in that year; and Column 3 shows that the effects of increasing the *M&A intensity*—where deal values are normalized by assets—are quite substantial. We note that our dynamic model also indicates significant effects of past CEO compensation values, but the effect of M&A intensity remains highly significant nevertheless.

The results in Panel B, using the broader definition of M&A transactions, yield results that are very similar to those in Panel A. That is, the effects of M&A activity on CEO compensation are not influenced by the filter used for recognizing the transactions, a concern expressed for other results in the M&A literature by Netter, Stegemoller, and Wintoki (2011).

In Panel C, we decompose the effects of acquisition deal values on the cash and equity-based components of CEO compensation. Again, the benchmark estimation (without controlling for the effects of M&A activity) in Columns 1 and 2 is of interest. In particular, the significant positive effects of lagged stock returns on EBC are consistent with Cyert et al. (2002) and, at a more general level, with Gabaix and Landier (2008). Furthermore, cash compensation is higher in firms with lower growth opportunities, and conversely EBC is positively related to the growth opportunities; these results are consistent with the theoretical predictions in the literature (e.g., Smith and Watts, 1992). Furthermore, CEO tenure has opposing effects on cash pay versus EBC: CEOs with longer tenure ceteris paribus receive higher cash salary but lower EBC. This result is consistent with the managerial entrenchment hypothesis, which argues that entrenched managers receive relatively greater proportion of compensation through non-performance-contingent methods, such as cash (Stulz, 1990); this finding also confirms related results in the empirical entrenchment literature (e.g., Hu and Kumar, 2004). We note that the insignificant effects of CEOs' tenure on their total compensation (seen in Panel A) likely reflects the opposing effects of tenure on CEO pay components.

Turning to Columns 3—6, we find a striking *asymmetry* between the effects of M&A on cash versus equity-based compensation. The effects of raw deal values on cash pay are insignificant but, in contrast, are highly significant for EBC. However, raising M&A intensity increases both cash pay and EBC significantly, but the effect on EBC is substantially higher compared with cash pay. Specifically, the estimated coefficients in Columns 4—5 indicate that increasing M&A intensity by 1% in any firm-year raises the cash pay by about 7% but the EBC by over 40%. In untabulated results, we find similar

results when we use the M&A active dummy, the number of completed acquisitions, or the broader definition of M&A.[21]

The dynamic pooled OLS estimates are consistent (with our standard error adjustments) only if there is no unobserved firm- or time-specific heterogeneity, i.e., there is no omitted variable problem. Of course, as we have argued above, endogeneity is a significant concern here—that is, the relationship between M&A and CEO compensation may be due to a common response to a latent or omitted variable. Furthermore, the pooled OLS does not accommodate simultaneity or dynamic interrelationships between M&A and compensation. We now use the identification strategies described in Section 2 to examine these issues.

### *4.2 Firm and Year Fixed-Effects (FE) Regressions*

In Table 4, we present the results of estimating the empirical compensation model using firm and year fixed effects. While the analysis in Table 3 indicates that all four measures of M&A activity have a similar and significant positive effect on CEO compensation, the M&A intensity measure—namely, the total deal amount normalized by the total asset size of the firm—is the most economically appealing measure because it controls for both heterogeneity in deal size and firm size. We henceforth report only results with respect to the intensity measure, using the standard measure of M&A transactions. Untabulated results indicate, however, that our estimations are robust to the broader definition of the transactions. The standard errors of the coefficient estimates are adjusted for heteroskedasticity and within-firm clustering to account for the possibility of correlations across firms and through time (Petersen, 2009). Finally, for reasons of space we do not tabulate the estimates of the calendar year effects.

The results continue to indicate that M&A intensity has significant influence on CEO compensation even after controlling for firm- and year-specific fixed effects. These effects are economically substantial as well: Increasing M&A intensity by 1% raises total CEO pay by over 16%, other things held fixed. Furthermore, the fixed effects regression reinforce the earlier finding that the effects of M&A activity on the equity-based

[21] For saving space, we will henceforth present results for deal values and not tabulate the results for M&A activity (through the dummy variable) and the number of deals. Unless otherwise noted, the results are similar to that obtained from using the deal values and are available upon request.

component of CEO compensation are much stronger compared with cash pay in terms of economic size and statistical significance.[22]

Turning to the influence of other factors, we continue to find strong and positive effects of firm size and lagged stock returns on total CEO pay and its cash and equity-based components. However, while growth options are significantly negatively related to cash pay, which as we noted before, is consistent with the theoretical and the empirical CEO compensation literatures, taking into account the firm and year fixed effects reveals that they (growth options) do not significantly impact the EBC. Put differently, the positive effects of growth options on the EBC in the regressions in Table 3 appear to arise from not controlling for unobserved firm-specific heterogeneity.

In a similar vein, addressing unobserved firm-specific heterogeneity through the fixed effects provides a different perspective on the role of CEO entrenchment and power related variables. Specifically, while CEO duality and high values of the Bebchuk et al. (2009) E-index significantly influence total CEO pay in Table 3, their effects on total CEO compensation are essentially insignificant in the fixed effects regressions of Table 4. But we also find that more entrenched managers—in terms of longer tenure, being the Chair of the board, and with high E-index values—earn significantly greater cash salary, but the effects of entrenchment on EBC are marginally negative; both these findings are consistent with the entrenchment literature, as we noted above. The insignificant effect of entrenchment (other than tenure) on total CEO compensation is then likely due to the relatively greater size of the EBC compared with cash salary. Overall, comparing the effects of CEO entrenchment on compensation in Tables 3 and 4 suggests that controlling for unmeasured firm-specific fixed factors is important for reducing the bias in the estimation of the effects of CEO power on equity-based compensation.

As we noted above, the firm and year fixed effects regressions do not allow for dynamic relationships between the dependent and independent variables and also do not deal with the simultaneity between M&A and CEO compensation. We now use the GMM IV estimator that is described in Section 2.4.

[22] Indeed, controlling for within-firm variation reduces the magnitude and significance of the influence of M&A activity on cash pay, as is evident from comparing the estimates in Table 4 with those in Panel C of Table 3.

### *4.3 Dynamic GMM IV Estimation*

We implement the two-step GMM with clustered robust Windmeijer correction standard errors—described in Section 2.4—as follows. In the first stage we fix the lag $p$ for the empirical model of CEO compensation specified in Equation (3). Then, taking $p$ as given, we use the first-differenced version of the empirical model to eliminate the time-invariant unobserved heterogeneity—that is, $\alpha_i$. And, finally, we take the available lagged values of the first-differenced variables—with an arbitrary lag of $k$—as instruments (IVs). The performance of the estimated model is optimized at $p = 2$ and $k = 2$. (However, for robustness we check the estimates for various values of $p$ and $k$ and also include other exogenous IVs—see Section 4.5.)

We present the results of this estimation procedure in Table 5. M&A intensity has a statistically and economically significant impact on total CEO compensation (cf. Column 1). Increasing the M&A intensity by 1% during any year raises ceteris paribus the CEO total compensation by over 19%. We note that this effect is higher compared with the corresponding estimates in the pooled OLS and the fixed effects regressions. Furthermore, the results in Columns 2 and 3 indicate that the effects of higher M&A intensity on EBC are substantially larger (in magnitude) compared with cash pay, which is also similar to the previous results. Indeed, after controlling for the dynamic reverse causation between (past) executive compensation awards and (current) M&A incentives, the effects of M&A activity on cash pay are no longer statistically significant, continuing the trend observed in Tables 3 and 4.

There is also a notable change in the role of lagged stock returns. In contrast to the pooled OLS and fixed effects regression, where lagged stock returns had a strong effect on total pay and both its components, we now find in Table 5 that recent stock return performance only has a significant impact on cash pay; but it has an insignificant effect on the EBC, and consequently, the effect on total pay is only marginally significant. Thus, after controlling for the effects of past CEO compensation on current M&A activity and the simultaneity of M&A and CEO compensation, the effects of past stock performance on the EBC and total pay reduce in significance. This suggests that lagged stock returns influence *current* CEO equity-based compensation through an indirect mechanism: past stock performance affected previous CEO compensation,

especially the awards of equity-based incentive compensation, which in turn provide incentives for current M&A activity (cf. Holmstrom and Kaplan, 2001). As we noted above, many studies document the effects of past stock performance on CEO compensation, especially equity based compensation. However, the dynamic transmission mechanism through the effects of past CEO compensation on current M&A activity appears not to have been highlighted in the literature.

We perform several specification tests for the dynamic GMM estimation framework. The major concern with the specification choice is whether it or not it includes sufficiently many lags to control for the dynamic aspects of the relationship between M&A activity and CEO compensation. Specifically, if the assumptions of the GMM IV estimator are valid, then the residuals in first differences (AR(1)) should be correlated but there should be no serial correlation in the second differences (AR(2)). Using the test suggested by Arellano and Bond (1991), we are unable to reject the null hypothesis that there is zero autocorrelation in the second differences for the total pay and for the EBC and cash pay specifications. Next, we use the difference-in-Hansen test for the null hypothesis that IVs in the level equation are exogenous and cannot reject it either at conventional levels of significance for all three specifications—that is, for total CEO pay and its two components. Finally, we apply the Hansen test for the null hypothesis that the overidentifying restrictions from the use of multiple lags as instruments. While we do not reject the null hypothesis of the validity of instruments for CEO total pay, we do so at 5% levels for the EBC and the cash pay specifications.

We turn next to comparison of CEO compensation of firms with M&A activity in a given year with comparable firms—chosen by the propensity score matching (PSM) procedure that had no such activity during that year.

### *4.4 PSM Results*

Since the PSM approach relies on observable firm characteristics to construct the matching firms, there is scope for errors if unobservable factors also affect the assignment process (i.e., Eq. (4)) and CEO compensation. But if the unobservable factors are time-invariant, then the combination of difference-in-differences methodology (DID) with PSM, as proposed by Heckman et al. (1997), can improve the efficiency of the

results. We again take advantage of our panel data structure and implement the matching-DID estimation.

We provide the results of the PSM analysis in Table 6. Overall, we find that the average CEO compensation in the acquiring firms is approximately 5% higher compared with CEO compensation in matching firms with no acquisition activity (Column 2 in Panel A). These pay differences are significant at the 1% level and are robust to the matching algorithms, the definition of M&A activities, and the standard versus the DID PSM estimation. In untabulated results, we also perform a number of balancing tests to check the reliability of our PSM results. In particular, we examine the standardized bias for all the independent variables in $X_{it}$ in the empirical model given in Equation (3) (Rosenbaum and Rubin, 1985) and the joint insignificance of these covariates before and after matching. The test results show that our PSM estimation is robust.

*4.5 Robustness Analysis*

We performed a variety of robustness checks. As another check against endogeneity, we estimated *change regression*s or the first-differenced version of the empirical model through dynamic pooled OLS (see, e.g., Chava, Livdan, and Puranandam, 2009); the results indicates a highly significant and positive effect of changes in M&A intensity on total CEO pay and the EBC. Next, we conducted robustness tests with respect to specifications of the fixed effects regressions and the dynamic GMM IV estimation. Specifically, we included lagged M&A intensity in both the dynamic fixed effects regression specification (Panel B of Table 4) and the specification in Table 5. The main results were essentially unaffected. We also used higher lag values in CEO compensation (i.e., *p*) for the fixed effects and the dynamic GMM IV estimation without material changes in the results. Finally, following Arellano and Bond's (1996) we used all available lags of the independent variables as instruments and, again, the results were robust.

In sum, results from fixed effects regressions and dynamic GMM IV estimation—that help control for latent common factors, simultaneity, and reverse causation between current M&A and past CEO compensation—and comparisons of CEO compensation of acquiring firms with matching non-acquiring firms indicate that M&A intensity has a statistically and economically significant positive effect on CEO compensation.

Furthermore, the effects of M&A arise mainly through an increase in the equity-based rather than the cash component of CEO compensation. This result appears consistent with the more general trends in CEO compensation during our sample period. As we mentioned before, the sharp increase in average CEO compensation since the early 1980s has preponderantly been through equity-based compensation, primarily through the expanded use of stock options (Frydman and Saks, 2010).

Our panel data based identification is helpful in potentially distinguishing between the efficiency and the agency views on the effects of M&A on executive compensation. Based on the efficiency view, the observed positive relation of the level of M&A activity to CEO compensation could be due to an optimal response to unobserved common factors, such as improvements in investment opportunities or managerial productivity. However, we continue to find a significant positive effect of the level of M&A activity on total CEO compensation, especially the EBC. These results appear supportive of the agency view of the interaction between M&A and CEO compensation. In particular, Cyert et al. (2002) and Jensen, Murphy, and Wruck (2004) argue that boards and executives may, either mistakenly or through strategic calculation, consider options as a low-cost method for increasing executive compensation.

Overall, the results are consistent with agency view that CEOs seek to set the level and composition of their compensation, subject to market constraints. Our analysis extends this view by highlighting the role of M&A in facilitating the extraction of rents by CEOs.[23] This raises the natural question: Are more entrenched CEOs more effective in using success in M&A to raise their compensation? Moreover, the results above motivate a further examination of the effects of recent stock performance on CEO compensation directly and indirectly through M&A. We turn to these issues in the next Section.

## 5. The Role of Recent Stock Performance and CEO Entrenchment

We analyze the role of CEO entrenchment in the effects of M&A activity on CEO compensation in Table 7. Using firm and year fixed effects regressions, we study the

[23] The insignificant effects of M&A on cash compensation are not inconsistent with Grinstein and Hribar (2004), who find a positive relation between acquisitions and M&A bonuses, mostly paid as cash bonuses, because Grinstein and Hribar concentrate on a sample of firms that completed 327 major deals during 1993-1999. Our tests cover all the M&A deals in the SDC database over a longer period and compare the effects of M&A on cash compensation relative to firms with no M&A activity.

incremental influence of proxies for CEO entrenchment and power on the effects of M&A intensity.[24] These proxies are: Long CEO tenure, defined as CEO tenure in the top quartile of sample CEO tenures; CEO duality (cf. Section 3); and high values of the entrenchment index of Bebchuk et al. (2009). We also include proxies for high free cash-flow agency costs by identifying firms that are simultaneously in the top quartile of free cash-flows and the lowest quartile of leverage (see, e.g., Titman, Wei and Xie, 2004).[25]

We find that none of the proxies for CEO entrenchment and power significantly enhance the effects of M&A intensity on total CEO compensation or the EBC. The interactions between high E-index values and high free cash-flow agency costs with the effects of M&A intensity on cash pay are actually negative, but we note that M&A intensity itself has relatively weak effects on cash pay. Overall, the results in Table 7 do not support the hypothesis that CEOs with longer tenure or those that also chair the board or those belonging to firms with relatively low power for shareholders are able to more effectively use M&A successes to raise their compensation.

The regressions-based analysis in the previous section indicates that recent stock performance has direct effects as well as indirect effects—through the influence of stock price valuation changes on M&A activity—on current CEO compensation. To avoid a specification bias, we therefore examine the influence of recent stock performance on M&A intensity and CEO compensation through independent sorting analysis.

Panel A of Table 8 presents the averages of total CEO compensation, EBC, and cash pay for quintiles of raw stock returns of the firm in the previous year. This panel also presents the averages of the annual M&A deal values and M&A intensities for the quintiles of lagged stock returns.[26] In Panels B and C, we present the double sorting analysis. In Panel B, we display the averages in each cell for the *percentage changes* in CEO compensation (= ln(pay(t)) – ln(pay(t-1)), while in Panel C we provide the averages

[24] The inclusion of the interaction terms sometimes poses convergence issues for the nonlinear optimization in the dynamic GMM estimator. However, the results of that estimation for the interaction terms are similar to that shown in Table 7.

[25] High levels of debt impose "hard constraints" on cash outflow through payments of interest and repayment of loan principal and ceteris paribus reduce the free cash-flow agency costs (Jensen, 1986; Hart and Moore, 1995).

[26] We also decompose the acquisition measures in terms of being financed mainly through stock and cash, an issue that we will address in the next section.

for the CEO compensation and its components, for the ten groups defined by the intersection of the lagged stock returns and M&A intensities.

The results in Panel A (of Table 8) confirm the strong positive correlation between lagged stock returns and equity-based compensation noted in the literature (Cyert et al., 2002; Frydman and Saks, 2010). And given the preponderant role of EBC in CEO compensation during our sample period (Gabaix and Landier, 2008), it is not surprising that there is a significant positive relation of total CEO pay to lagged stock return. (Parametric and non-parametric tests reject the null hypothesis of equality of means of compensation in the top and bottom quintiles of lagged stock returns at high levels of confidence). In a similar vein, we also see a positive relation of lagged stock returns to M&A deal values and M&A intensities. This positive relation is consistent with the hypothesis that stock over-valuation is a significant driver of M&A activity (e.g., Rhodes-Kropf et al., 2005). But if the high stock returns are based in genuine improvements in the firm's economic prospects, then this positive relation is also consistent with the argument that managers with high levels of EBC have incentives to create value through M&A managers (Holmstrom and Kaplan, 2001).

Meanwhile the results in Panel B show the *incremental* positive effect of M&A intensity on total CEO compensation and the EBC. For each quintile or group of lagged stock returns, the average change in total CEO compensation for the highest M&A intensity firms is significantly greater—based on a *t*-test of the equality of the means—compared with the corresponding compensation changes in the lowest M&A intensity firms. The same pattern holds true for changes in the EBC except for the firms with highest stock returns. It is possible that the direct effect of the recent stock performance on CEO compensation is sufficiently great in the highest return group that raising M&A intensity can only have proportionately small incremental effects.

Turning to Panel C, we find evidence of a significant positive interaction amongst strong recent stock price performance, high M&A intensity, and CEO compensation. Specifically, while the difference between the average total CEO pay of the lowest stock return versus highest stock return firms is about 15% when the M&A intensity is low (i.e., (1.99-1.74)/1.74), this corresponding difference is about 31% for the high M&A intensity firms (i.e., (1.86-1.42)/1.42). That is, the positive relation of recent stock

performance and total CEO compensation is almost twice as strong for high M&A intensity firms compared with the low M&A intensity firms. And, based on the results above, it is perhaps not surprising that the positive influence of M&A intensity on the relation of recent stock performance on CEO compensation occurs mainly through the EBC and not cash pay.

Finally, in Table 9 we replicate the analysis of Table 8 but using stock returns adjusted for the median industry returns (based on Fama-French 48 industry sectors). The results are quite similar to those seen in Table 8.

In sum, the analysis of this Section indicates that the positive relation of M&A intensity and CEO compensation is not enhanced significantly for more entrenched and powerful CEOs or for CEOs that lead firms with higher free cash-flow agency costs. However, we find that positive recent stock performance plays a prominent role in CEO compensation. Apart from the direct positive relation of recent stock returns and the EBC, there is an indirect effect: Firms that have enjoyed high recent stock returns tend to have a higher M&A intensity which, in turn, is associated with higher equity-based compensation awards and, therefore, higher overall CEO compensation.

The significant role of recent stock performance in the interaction between M&A activity and CEO compensation motivates further examination of the hypothesis that CEOs strategically use recent superior stock performance to increase M&A activity that, eventually, positively CEO compensation. We pursue this view by examining the relative effects of stock- versus cash-financed deals.

## 6. The Effects of Stock- versus Cash-Financed Acquisitions

In Table 10 we decompose the effects of M&A intensity on CEO compensation by the primary method of deal financing. We define transactions with 50% or more stock (cash) payment as acquisitions paid mostly by stock (cash). We then compute for each deal the value paid with stock (cash) by multiplying the percentage of stock (cash) payment with the transaction value recorded in SDC. Finally, we sum the value paid mostly with stock (cash) and compute the M&A intensity in terms of the method of financing for each firm-year.

The analysis in Table 10 indicates that there is a substantial asymmetry between the effects of stock and cash financed deals on CEO compensation. Acquisitions financed

mostly by stock ceteris paribus have a significantly positive influence on the total CEO compensation and the EBC, consistent with the previous results. In fact, raising the M&A intensity of stock financed deals by 1% increases total CEO compensation by over 21% and the EBC by over 29%. However, acquisitions paid for mostly by cash do not appear to have a statistically significant effect on any component of CEO compensation.

In sum, the results in Table 10 indicate that after controlling for unobserved firm-specific factors—including productivity-related factors—the level of M&A activity financed mostly through cash no longer has a significant influence on CEO compensation, while stock-finance acquisition activity does have a significant effect. This appears pertinent to the debate on the efficiency versus agency based drivers of CEO compensation. As we mentioned above, if the positive relation of the level of M&A activity to CEO compensation is due to improved managerial productivity, then there should be no significant incremental effects of M&A intensity in the fixed effects regressions. While this is true for the acquisitions financed mostly through cash, it is not the case for stock-financed acquisitions, suggesting that omitted time-invariant firm-specific factors cannot explain the influence of stock-financed acquisitions on CEO compensation. It is worth noting here that the literature documents a positive announcement effects for mostly cash financed acquisitions of public firms, but the announcement effects for mostly stock financed acquisitions are negative.[27]

In juxtaposition with the results in the previous Section, the analysis of Table 10 suggests that CEOs are not only able to exploit strong recent stock performance for increasing M&A activity through stock-financed deals, as has been suggested by the literature, but to use this enhanced (M&A activity) to increase their compensation, largely through the awards of equity or stock options. An implication of this agency based view of CEO compensation is that exogenous events that make stock financed acquisitions more costly, say, through regulatory changes, should weaken the impact of such acquisitions on CEO compensation by raising the costs of increasing CEO compensation through this mechanism. Such a regulatory event, in fact, did occur in 2001 when accounting rule changes eliminated the pooling method (SFAS 141) and goodwill amortization (SFAS 142). These rule changes appear to have significantly reduced the

[27] In contrast, when acquirers pay by stock for private targets or subsidiaries of other public firms, they receive a positive market reaction (e.g., Fuller, et al., 2002).

percentage of acquisitions that use stock-for-stock exchange which was required for the pooling method prior to the rule change (Ali and Kravet, 2012).

In Table 11 we examine the effects of the passage of SFAS 141 on the relation of stock-financed acquisitions to CEO compensation by identifying such acquisitions that occurred after the passage of the accounting rule change.[28] There is a significant reduction in the influence of stock-financed acquisitions on total CEO compensation and EBC after the passage of SFAS 141. Holding other things fixed, increasing M&A intensity of stock-financed deals by 1% after the passage of SFAS 141 raises total compensation by about 30% less compared with a similar transaction prior to the passage of the accounting rule change. We interpret this result as consistent with the agency view of the effects of strong recent stock performance on acquisitions and CEO compensation: In effect, the accounting rule change exogenously raised the costs of increasing CEO compensation through intense M&A activity.

## 7. Summary and Conclusions

The positive relation of stock market valuation to mergers and acquisitions (M&A) activity (especially stock-financed acquisitions), exemplified by the historic M&A waves in the 1990s and the first half of the last decade, have attracted much recent attention. But whether this intense M&A activity ultimately created shareholder value for the acquiring firms remains a subject of ongoing debate in the literature. Understanding managerial incentives with respect to M&A is important for this debate and more generally sheds light on determination of executive compensation. Using a large sample of U.S. acquiring and non-acquiring firms and covering a broad sample of transactions, we examine the effects of mergers and acquisitions (M&A) on CEO compensation during 1993-2006, a period of intense M&A activity. We alleviate endogeneity concerns through dynamic panel data estimation, propensity score matching, and using a natural experiment exogenous accounting regulatory changes in 2001 that significantly affected the benefits of stock-financed acquisitions.

We find that ceteris paribus M&A activity has statistically and economically significant effects on CEO compensation. CEOs of firms with at least one successful deal

[28] We do not use firm-specific fixed effects regressions because there is not sufficient within-firm variation for the post SFAS 141 sample. Instead, we use dynamic pooled OLS.

in a given year earned 5.1% (or $270,300) more than CEOs in otherwise similar firms with no M&A activity during that year. And raising the annual deal value relative to assets by 1% increases the total CEO pay that year by about 23%. But, controlling for endogeneity and indirect effects, the influence of M&A impacts only equity pay and occurs mostly through deals that are primarily stock financed. We also find a strong positive interaction in the influence of recent stock returns and M&A activity on CEO compensation. However, the usual measures of CEO entrenchment and power do not significantly enhance the effects of M&A on compensation.

Our analysis supports the view that rent-seeking CEOs use strong recent performance of their firm's stock to pursue stock-financed acquisitions that also positively influence their compensation, especially the equity-based awards. The results not only help clarify managerial incentives with respect to stock-valuation based M&A, but also further our understanding of the executive compensation process.

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**Exhibit 1: Definition of variables**

| Dependent variable | Definition |
|---|---|
| Totalpay | ln(1 + salary + bonus + non-equity incentive plan compensation + grant-date fair value of stock awards + grant-date fair value of option awards + deferred compensation + other compensation). Collected from S&P's ExecuComp. |
| Cashpay | ln(1 + salary + bonus). Collected from S&P's ExecuComp. |
| Equitypay | ln(1 + grant-date fair value of stock awards + grant-date fair value of option awards). Collected from S&P's ExecuComp. |
| **Explanatory variables** | **Definition** |
| Acquisition(active) | An indicator variable takes the value of 1 if at least one M&A deals are completed in a given CEO-firm-year, and 0 otherwise. Collected from SDC M&A database. Criteria for transactions to be included: (1) MA Type Code is either "DD" or "UD", and (2) FORMC is either "M" or "A". |
| Acquisition(number) | The total number of deals completed in a given CEO-firm-year. Collected from SDC M&A database. Criteria for transactions to be included: (1) MA Type Code is either "DD" or "UD", and (2) FORMC is either "M" or "A". |
| Acquisition(amount) | ln(1 + the aggregate deal values completed in a given CEO-firm-year. Collected from SDC M&A database. Criteria for transactions to be included: (1) MA Type Code is "DD", and (2) FORMC is either "M" or "A". |
| Acquisition(intensity) | ln(1 + the aggregate deal values completed in a given CEO-firm-year/total asset in the previous year). Collected from SDC M&A database. Criteria for transactions to be included: (1) MA Type Code is "DD", and (2) FORMC is either "M" or "A". |
| Acquisition(amount: by stock (cash)) | ln(1 + the aggregate deal values completed in a given CEO-firm-year that are paid mostly by stock (cash)). Collected from SDC M&A database. Criteria for transactions to be included: (1) MA Type Code is "DD", (2) FORMC is either "M" or "A", and (3) 50% or more transaction value is paid by stock (cash). |
| Firm size | ln(1 + book value of assets + market value of common stock – book value of common equity – balance sheet deferred taxes). |
| ROA | ln(1 + income before extraordinary items divided by the book value of assets). |
| Stock return | ln(1 + annualized monthly common stock return). |
| Investment opportunities | A factor score from the principal components analysis that combines the firm's investment intensity, the geometric growth in the market value of assets, the market-to-book ratio of assets, and the ratio of R&D expenses to the book value of assets. The chosen factors are defined in Baber, Janakiraman, and Kang (1996). |
| Stdev of ROA | Standard deviation of ROA over the previous 5 years. |
| Stdev of stock return | Annualized standard deviation of the monthly natural log of the common stock returns over the past 60 months. |
| CEO tenure | ln(1 + the number of years since being appointed as CEO). Collected from S&P's ExecuComp. |
| CEO-chair duality | An indicator variable takes the value of 1 if the CEO is also a chair of the company's board in a given CEO-firm-year, and 0 otherwise. Collected from S&P's ExecuComp. |
| E-index | The number of firm-level entrenchment provisions complied by Bebchuk, Cohen, and Ferrell (2009) using information published by IRRC. Collected from Lucian Bebchuk's website. |
| Regulated | An indicator variable takes the value of 1 if the firm is in financial (i.e., SIC codes between 6000 and 6999) or utilities (i.e., SIC codes between 4910 and 4940) industries, and 0 otherwise. |
| Industry sales growth | The median of the sale growth rate in a given industry-year, where industry is classified by Fama-French 48 industry sectors. |
| SFAS 141 | An indicator variable takes the value of 1 if the firm-year is after 2001 (the passage of SFAS 141), and 0 otherwise. |

**Table 1: Sample M&A**

This table displays the sample distribution of M&A activities between 1993 and 2006. The sample is composed of observations with available data for the subsequent regression analyses. Definitions of the three measures of M&A activities are described in Exhibit 1. Panel A gives the summary statistics of the M&A measures in this study. Panel B presents the distribution over time. Columns 1—6 display the number of observations in a given fiscal year. Columns 7 and 8 display the mean and median of the aggregate deal value completed by acquiring-firm year. Panel C presents the distribution across industries based on the 10-industry classification in Kenneth French's website. Columns 1—6 display the number of observations in a given industry. Columns 7 and 8 display the mean and median of the aggregate deal value completed by an acquirer in a given industry. Panel D lists the descriptions of each of the ten industry sectors. All nominal quantities are converted into 2002 dollars using the GDP deflator of the Bureau of Economic Analysis.

Panel A. Deal Frequency

| Variable | Observations | Mean | Median | Std. dev. |
|---|---|---|---|---|
| Acquisition(active) | 14,205 | 0.121 | 0.000 | 0.326 |
| Acquisition(number) | 1,719 | 1.351 | 1.000 | 0.981 |
| Acquisition(amount) ($ m) | 1,719 | 1,520 | 263 | 5,500 |
| Acquisition(intensity) | 1,719 | 0.178 | 0.080 | 0.244 |
| Acquisition(active) – alt. | 11,767 | 0.258 | 0.000 | 0.438 |
| Acquisition(number) – alt. | 3,036 | 2.075 | 1.000 | 1.759 |
| Acquisition(amount) – alt. ($ m) | 3,036 | 945 | 155 | 4,140 |
| Acquisition(intensity) – alt. | 3,036 | 0.140 | 0.061 | 0.205 |

Panel B. M&A Over Time

| Fiscal year | Acquisition(active) | | Acquisition(number) | | | Total | Acquisition(amount) ($ m) | |
|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 1 | 2 | 3+ | | Mean | Median |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 1993 | 288 | 32 | 27 | 4 | 1 | 320 | 623.342 | 182.338 |
| 1994 | 664 | 70 | 48 | 15 | 7 | 734 | 551.675 | 180.253 |
| 1995 | 777 | 100 | 67 | 26 | 7 | 877 | 771.476 | 239.868 |
| 1996 | 793 | 109 | 87 | 15 | 7 | 902 | 1,398.570 | 236.266 |
| 1997 | 704 | 115 | 87 | 18 | 10 | 819 | 1,302.149 | 488.134 |
| 1998 | 857 | 153 | 113 | 28 | 12 | 1,010 | 1,302.996 | 302.562 |
| 1999 | 834 | 158 | 122 | 25 | 11 | 992 | 2,568.951 | 507.085 |
| 2000 | 888 | 158 | 121 | 24 | 13 | 1,046 | 2,664.427 | 325.097 |
| 2001 | 891 | 125 | 101 | 14 | 10 | 1,016 | 1,582.976 | 265.178 |
| 2002 | 1,151 | 137 | 115 | 15 | 7 | 1,288 | 1,071.448 | 192.822 |
| 2003 | 1,160 | 119 | 97 | 16 | 6 | 1,279 | 1,047.775 | 155.780 |
| 2004 | 1,182 | 155 | 123 | 26 | 6 | 1,337 | 1,006.182 | 222.443 |
| 2005 | 1,147 | 144 | 122 | 16 | 6 | 1,291 | 1,338.933 | 175.603 |
| 2006 | 1,150 | 144 | 116 | 21 | 7 | 1,294 | 2,327.053 | 248.616 |
| Total | 12,486 | 1,719 | 1,346 | 263 | 110 | 14,205 | | |

Panel C. M&A Across Industries

| | Industry | Acquisition (active) | | Acquisition(number) | | | Total | Acquisition(amount) ($ m) | |
|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 1 | 2 | 3+ | | Mean | Median |
| | | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 1 | Non-Durables | 1,006 | 101 | 85 | 13 | 3 | 1,107 | 1,059.020 | 263.592 |
| 2 | Durables | 426 | 38 | 34 | 3 | 1 | 464 | 762.389 | 149.479 |
| 3 | Manufacturing | 2,374 | 256 | 212 | 38 | 6 | 2,630 | 971.925 | 240.132 |
| 4 | Energy | 509 | 72 | 66 | 6 | 0 | 581 | 3,565.715 | 601.122 |
| 5 | Hi Tech | 1,773 | 438 | 313 | 82 | 43 | 2,211 | 941.101 | 184.677 |
| 6 | Telecommunication | 219 | 39 | 28 | 4 | 7 | 258 | 7,954.725 | 2,184.682 |
| 7 | Shops | 1,692 | 135 | 116 | 15 | 4 | 1,827 | 1,018.855 | 236.266 |
| 8 | Healthcare | 810 | 177 | 141 | 28 | 8 | 987 | 1,991.576 | 269.001 |
| 9 | Utilities | 995 | 46 | 44 | 0 | 2 | 1,041 | 1,986.795 | 724.836 |
| 10 | Other | 2,682 | 417 | 307 | 74 | 36 | 3,099 | 1,611.466 | 340.069 |
| | Total | 12,486 | 1,719 | 1,346 | 263 | 110 | 14,205 | | |

Panel D. Definitions of the 10-industry Classifications

| | Industry | Definitions |
|---|---|---|
| 1 | Non-Durables | Food, tobacco, textiles, apparel, leather, toys. |
| 2 | Durables | Cars, TV's, furniture, household appliances. |
| 3 | Manufacturing | Machinery, trucks, planes, chemicals, office furniture, paper. |
| 4 | Energy | Oil, gas, and coal extraction and products. |
| 5 | Hi Tech | Computers, software, and electronic equipment. |
| 6 | Telecommunication | Telephone and television transmission. |
| 7 | Shops | Wholesale, retail, and some services (laundries, repair shops). |
| 8 | Healthcare | Healthcare, medical equipment, and drugs. |
| 9 | Utilities | Utilities. |
| 10 | Other | Mines, construction, hotels, transportation, business services, entertainment. |

**Table 2: Summary Statistics**

This table provides summary statistics of CEO compensation and firm as well as CEO characteristics. The sample is composed of observations with available data for the subsequent regression analyses. The definition of each variable is described in Exhibit 1. Panel A presents the descriptive statistics of all sample observations. Panel B gives the univariate comparison of the mean [median] for the same set of variables between non-acquiring versus acquiring firm. Columns 6 and 7 present the *t*-statistics for differences in means (*z*-statistics in bracket of the Wilcoxon's rank-sum test for differences in medians). Two-sided test significant at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively. All nominal quantities are converted into 2002 dollars using the GDP deflator of the Bureau of Economic Analysis.

| Panel A. CEO Compensation and Firm Characteristics | | | | |
|---|---|---|---|---|
| Variable | Observations | Mean | Median | Std. dev. |
| Totalpay ($ m) | 14,205 | 5.323 | 2.755 | 12.510 |
| Cashpay ($ m) | 14,205 | 1.568 | 1.100 | 2.196 |
| Equitypay ($ millions) | 14,205 | 3.160 | 1.064 | 11.546 |
| Firm size ($ m) | 14,205 | 18,701 | 3,525 | 66,748 |
| ROA | 14,205 | 0.032 | 0.042 | 0.132 |
| Stock return | 14,205 | 0.063 | 0.099 | 0.440 |
| Investment opportunities | 14,205 | -0.059 | -0.180 | 0.489 |
| Stdev of ROA | 14,205 | 0.044 | 0.022 | 0.085 |
| Stdev of stock return | 14,205 | 0.400 | 0.347 | 0.208 |
| CEO tenure (year) | 14,205 | 7.847 | 5.000 | 7.547 |
| CEO-chair duality | 14,205 | 0.668 | 1.000 | 0.471 |
| E-index | 14,205 | 2.434 | 2.000 | 1.317 |
| Regulated | 14,205 | 0.184 | 0.000 | 0.388 |
| Industry sales growth | 14,205 | 0.038 | 0.032 | 0.081 |

Panel B. Acquiring versus non-acquiring Firms

| Variables | Acquisition(active) | | Acquisition(number) | | | t-statistic [z-statistic for Wilcoxon's rank sum test] | |
|---|---|---|---|---|---|---|---|
| | 0 | 1 | 1 | 2 | 3+ | | |
| | (1) | (2) | (3) | (4) | (5) | (6)=(1)-(2) | (7)=(3)-((4)+(5)) |
| Totalpay ($ m) | 4.889 | 8.479 | 7.946 | 8.802 | 14.221 | -9.21*** | -2.21*** |
| | [2.611] | [4.072] | [3.849] | [4.539] | [5.701] | [-17.45***] | [-3.42***] |
| Cashpay ($ m) | 1.515 | 1.951 | 1.946 | 2.006 | 1.880 | -7.64*** | -0.19 |
| | [1.067] | [1.376] | [1.367] | [1.394] | [1.396] | [-12.30***] | [-0.73] |
| Equitypay ($ m) | 2.795 | 5.814 | 5.255 | 6.201 | 11.725 | -8.40*** | -2.42** |
| | [0.976] | [1.966] | [1.789] | [2.533] | [3.200] | [-16.16***] | [-3.47***] |
| Firm size ($ m) | 16,040 | 38,034 | 36,406 | 37,065 | 60,272 | -7.94*** | -1.41 |
| | [3,175] | [8,013] | [7,064] | [10,840] | [27,811] | [-19.43***] | [-6.48***] |
| ROA | 0.031 | 0.034 | 0.033 | 0.036 | 0.037 | -0.87 | -0.78 |
| | [0.042] | [0.038] | [0.039] | [0.036] | [0.023] | [2.70***] | [0.28] |
| Stock return | 0.061 | 0.072 | 0.065 | 0.098 | 0.095 | -1.01 | -1.25 |
| | [0.098] | [0.110] | [0.103] | [0.135] | [0.114] | [-1.21] | [-1.80*] |
| Investment opportunities | -0.197 | 0.122 | 0.083 | 0.196 | 0.419 | -13.16*** | -4.23*** |
| | [0.461] | [-0.033] | [-0.052] | [0.026] | [0.102] | [-18.12***] | [-4.12***] |
| Stdev of ROA | 0.045 | 0.041 | 0.042 | 0.037 | 0.038 | 1.96** | 0.93 |
| | [0.022] | [0.021] | [0.021] | [0.018] | [0.022] | [3.46***] | [2.16**] |
| Stdev of stock return | 0.401 | 0.392 | 0.394 | 0.377 | 0.396 | 1.65* | 1.12 |
| | [0.348] | [0.339] | [0.339] | [0.320] | [0.367] | [2.03**] | [0.04] |
| CEO tenure | 7.828 | 7.988 | 7.832 | 8.703 | 8.191 | -0.88 | 1.73* |
| | [5.000] | [6.000] | [6.000] | [6.000] | [7.000] | [-3.28***] | [-2.04**] |
| CEO-chair duality | 0.665 | 0.690 | 0.693 | 0.703 | 0.618 | -2.08*** | 0.55 |
| | [1.000] | [1.000] | [1.000] | [1.000] | [1.000] | [-2.05**] | [0.55] |
| E-index | 2.443 | 2.369 | 2.423 | 2.221 | 2.055 | 2.14*** | 3.15*** |
| | [3.000] | [2.000] | [2.000] | [2.000] | [2.000] | [2.05**] | [3.19***] |
| Regulated | 0.181 | 0.206 | 0.195 | 0.224 | 0.291 | -2.40*** | -1.96** |
| | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [-2.49***] | [-2.05**] |
| Acquisition(amount) ($ m) | | | 1,330.723 | 1,618.145 | 3,641.954 | | -2.57** |
| | | | [220.328] | [378.959] | [879.306] | | [-7.21***] |
| Acquisition(intensity) | | | 0.195 | 0.222 | 0.298 | | -2.97*** |
| | | | [0.086] | [0.091] | [0.130] | | [-3.02***] |

**Table 3: Dynamic Pooled OLS Regressions of Effects of M&A Activity on CEO Compensation**

The table reports the coefficient estimates from the dynamic pooled OLS regressions of the empirical model given in Equation (3). The dependent variable in Panel A and B is Totalpay while that in Panel C includes Cashpay and Equitypay. The definition of each variable is described in Exhibit 1. All nominal quantities are converted into 2002 dollars using the GDP deflator of the Bureau of Economic Analysis. All regressions include an intercept term and fiscal year dummies, but the respective estimates are not reported. Robust *t*-statistics adjusted for firm-level clustering are given in parenthesis under each coefficient estimate. Two-sided test significant at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively.

| Panel A: Total Pay with M&A Activity | | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| VARIABLES | | | Totalpay | | |
| Acquisition(amount) | | 0.0118*** | | | |
| | | (4.673) | | | |
| Acquisition(intensity) | | | 0.2958*** | | |
| | | | (5.916) | | |
| Acquisition(number) | | | | 0.0305*** | |
| | | | | (3.476) | |
| Acquisition(active) | | | | | 0.0508*** |
| | | | | | (3.860) |
| Firm size | 0.1395*** | 0.1365*** | 0.1387*** | 0.1378*** | 0.1377*** |
| | (17.768) | (17.696) | (18.029) | (17.603) | (17.630) |
| ROA | -0.0524 | -0.0418 | -0.0342 | -0.0460 | -0.0467 |
| | (-1.125) | (-0.899) | (-0.744) | (-0.990) | (-1.004) |
| Stock return | 0.1529*** | 0.1549*** | 0.1563*** | 0.1549*** | 0.1546*** |
| | (9.291) | (9.410) | (9.485) | (9.449) | (9.420) |
| Stock return, t-1 | 0.1525*** | 0.1504*** | 0.1509*** | 0.1526*** | 0.1525*** |
| | (8.851) | (8.757) | (8.798) | (8.882) | (8.873) |
| Investment opportunities | 0.0383** | 0.0338** | 0.0269* | 0.0327** | 0.0338** |
| | (2.414) | (2.139) | (1.690) | (2.095) | (2.135) |
| Stdev of ROA | 0.0819 | 0.0936 | 0.1017 | 0.0908 | 0.0894 |
| | (1.144) | (1.288) | (1.405) | (1.255) | (1.233) |
| Stdev of stock return | 0.1801*** | 0.1725*** | 0.1720*** | 0.1777*** | 0.1781*** |
| | (4.672) | (4.496) | (4.466) | (4.617) | (4.626) |
| CEO tenure | -0.0166** | -0.0167** | -0.0156** | -0.0173** | -0.0172** |
| | (-2.452) | (-2.455) | (-2.308) | (-2.555) | (-2.539) |
| CEO-chair duality | 0.0474*** | 0.0486*** | 0.0476*** | 0.0483*** | 0.0478*** |
| | (4.666) | (4.718) | (4.625) | (4.765) | (4.725) |
| E-index | 0.0057* | 0.0057 | 0.0054 | 0.0057 | 0.0056 |
| | (1.654) | (1.631) | (1.555) | (1.638) | (1.614) |
| Regulated | -0.1434*** | -0.1445*** | -0.1428*** | -0.1435*** | -0.1426*** |
| | (-9.658) | (-9.714) | (-9.664) | (-9.657) | (-9.621) |
| Industry sales growth | 0.1672** | 0.1489** | 0.1457** | 0.1638** | 0.1629** |
| | (2.418) | (2.157) | (2.123) | (2.359) | (2.338) |
| Totalpay, t-1 | 0.3464*** | 0.3464*** | 0.3458*** | 0.3462*** | 0.3462*** |
| | (22.491) | (22.455) | (22.449) | (22.480) | (22.478) |
| Totalpay, t-2 | 0.2535*** | 0.2514*** | 0.2523*** | 0.2533*** | 0.2532*** |
| | (15.720) | (15.572) | (15.619) | (15.718) | (15.729) |
| Observations | 13,518 | 13,285 | 13,285 | 13,518 | 13,518 |
| Adjusted R-squared | 0.635 | 0.634 | 0.635 | 0.635 | 0.635 |

| Panel B: Total Pay with M&A Activity – Alternate Definition | | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| VARIABLES | Totalpay | | | |
| Acquisition(amount) – alt. | 0.0100*** | | | |
| | (4.733) | | | |
| Acquisition(intensity) – alt. | | 0.2599*** | | |
| | | (6.065) | | |
| Acquisition(number) – alt. | | | 0.0117*** | |
| | | | (2.902) | |
| Acquisition(active) – alt. | | | | 0.0255*** |
| | | | | (2.658) |
| Firm size | 0.1370*** | 0.1406*** | 0.1377*** | 0.1383*** |
| | (17.340) | (17.727) | (17.761) | (17.764) |
| ROA | -0.0312 | -0.0225 | -0.0492 | -0.0514 |
| | (-0.659) | (-0.481) | (-1.056) | (-1.104) |
| Stock return | 0.1548*** | 0.1562*** | 0.1542*** | 0.1535*** |
| | (9.195) | (9.278) | (9.413) | (9.354) |
| Stock return, t-1 | 0.1431*** | 0.1439*** | 0.1514*** | 0.1517*** |
| | (8.030) | (8.089) | (8.770) | (8.814) |
| Investment opportunities | 0.0367** | 0.0272 | 0.0349** | 0.0364** |
| | (2.206) | (1.627) | (2.234) | (2.287) |
| Stdev of ROA | 0.1149 | 0.1248* | 0.0907 | 0.0863 |
| | (1.535) | (1.656) | (1.243) | (1.190) |
| Stdev of stock return | 0.1649*** | 0.1626*** | 0.1820*** | 0.1822*** |
| | (4.140) | (4.069) | (4.694) | (4.703) |
| CEO tenure | -0.0172** | -0.0164** | -0.0170** | -0.0168** |
| | (-2.402) | (-2.292) | (-2.504) | (-2.468) |
| CEO-chair duality | 0.0494*** | 0.0478*** | 0.0477*** | 0.0477*** |
| | (4.564) | (4.423) | (4.710) | (4.709) |
| E-index | 0.0046 | 0.0043 | 0.0059* | 0.0056 |
| | (1.249) | (1.176) | (1.693) | (1.606) |
| Regulated | -0.1471*** | -0.1481*** | -0.1392*** | -0.1393*** |
| | (-9.573) | (-9.626) | (-9.481) | (-9.441) |
| Industry sales growth | 0.1369* | 0.1320* | 0.1643** | 0.1669** |
| | (1.880) | (1.828) | (2.370) | (2.401) |
| Totalpay, t-1 | 0.3437*** | 0.3435*** | 0.3460*** | 0.3460*** |
| | (22.254) | (22.292) | (22.395) | (22.456) |
| Totalpay, t-2 | 0.2530*** | 0.2543*** | 0.2528*** | 0.2532*** |
| | (16.086) | (16.165) | (15.565) | (15.690) |
| Observations | 11,941 | 11,941 | 13,518 | 13,518 |
| Adjusted R-squared | 0.633 | 0.634 | 0.635 | 0.635 |

| Panel C: Compensation Components | | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| VARIABLES | Cashpay | Equitypay | Cashpay | Equitypay | Cashpay | Equitypay |
| Acquisition(amount) | | | 0.0012 | 0.0180*** | | |
| | | | (0.843) | (5.125) | | |
| Acquisition(intensity) | | | | | 0.0668*** | 0.4050*** |
| | | | | | (3.117) | (6.261) |
| Firm size | 0.0446*** | 0.1636*** | 0.0444*** | 0.1581*** | 0.0444*** | 0.1618*** |
| | (13.235) | (20.453) | (12.919) | (19.846) | (12.998) | (20.481) |
| ROA | 0.0012 | -0.0310 | 0.0017 | -0.0157 | 0.0048 | -0.0072 |
| | (0.065) | (-0.532) | (0.095) | (-0.270) | (0.269) | (-0.124) |
| Stock return | 0.1441*** | 0.0644*** | 0.1436*** | 0.0702*** | 0.1442*** | 0.0716*** |
| | (12.018) | (2.852) | (11.866) | (3.131) | (11.885) | (3.200) |
| Stock return, t-1 | 0.0403*** | 0.1152*** | 0.0391*** | 0.1144*** | 0.0392*** | 0.1152*** |
| | (5.463) | (5.477) | (5.276) | (5.471) | (5.280) | (5.515) |
| Investment opportunities | -0.0302*** | 0.1197*** | -0.0296*** | 0.1116*** | -0.0318*** | 0.1030*** |
| | (-4.174) | (5.515) | (-4.032) | (5.199) | (-4.282) | (4.757) |
| Stdev of ROA | 0.0824*** | 0.0862 | 0.0810*** | 0.1039 | 0.0842*** | 0.1131 |
| | (2.805) | (1.020) | (2.760) | (1.215) | (2.854) | (1.329) |
| Stdev of stock return | -0.0007 | 0.2901*** | 0.0006 | 0.2779*** | -0.0000 | 0.2778*** |
| | (-0.037) | (6.032) | (0.031) | (5.824) | (-0.001) | (5.800) |
| CEO tenure | 0.0128*** | -0.0636*** | 0.0131*** | -0.0642*** | 0.0133*** | -0.0626*** |
| | (3.741) | (-7.450) | (3.834) | (-7.510) | (3.880) | (-7.349) |
| CEO-chair duality | 0.0230*** | 0.0311** | 0.0231*** | 0.0336** | 0.0229*** | 0.0321** |
| | (4.574) | (2.407) | (4.552) | (2.571) | (4.523) | (2.458) |
| E-index | 0.0006 | 0.0036 | 0.0007 | 0.0036 | 0.0006 | 0.0032 |
| | (0.367) | (0.767) | (0.382) | (0.767) | (0.334) | (0.688) |
| Regulated | -0.0418*** | -0.1863*** | -0.0408*** | -0.1895*** | -0.0401*** | -0.1874*** |
| | (-5.509) | (-9.833) | (-5.351) | (-9.938) | (-5.268) | (-9.887) |
| Industry sales growth | 0.2098*** | 0.1318 | 0.2043*** | 0.1090 | 0.2027*** | 0.1058 |
| | (6.491) | (1.480) | (6.287) | (1.200) | (6.248) | (1.176) |
| Cashpay, t-1 | 0.5216*** | | 0.5194*** | | 0.5192*** | |
| | (30.832) | | (30.347) | | (30.373) | |
| Cashpay, t-2 | 0.1800*** | | 0.1807*** | | 0.1813*** | |
| | (9.901) | | (9.877) | | (9.909) | |
| Equitypay, t-1 | | 0.2545*** | | 0.2527*** | | 0.2521*** |
| | | (17.087) | | (16.944) | | (16.950) |
| Equitypay, t-2 | | 0.2344*** | | 0.2347*** | | 0.2357*** |
| | | (17.028) | | (17.217) | | (17.302) |
| Observations | 13,518 | 13,518 | 13,285 | 13,285 | 13,285 | 13,285 |
| Adjusted R-squared | 0.700 | 0.472 | 0.701 | 0.472 | 0.701 | 0.473 |

**Table 4 Fixed Effects Regressions of Effects of M&A Intensity on CEO Compensation**

This table reports the coefficient estimates of the empirical compensation model using firm fixed effects regressions. Panel A presents the results of the static model of Table 3 while Panel B gives the dynamic model by including past CEO compensation values as explanatory variables. The definition of each variable is described in Exhibit 1. All nominal quantities are converted into 2002 dollars using the GDP deflator of the Bureau of Economic Analysis. All regressions include an intercept term and firm and fiscal year dummies, but the respective estimates are not reported. Robust *t*-statistics adjusted for firm-level clustering are given in parenthesis under each coefficient estimate. Two-sided test significant at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| VARIABLES | Totalpay | Cashpay | Equitypay | Totalpay | Cashpay | Equitypay |
| Acquisition(intensity) | | | | 0.1630*** | 0.0523** | 0.2344*** |
| | | | | (2.783) | (2.098) | (3.032) |
| Firm size | 0.3142*** | 0.1019*** | 0.3265*** | 0.3074*** | 0.0987*** | 0.3178*** |
| | (12.760) | (9.922) | (10.860) | (12.214) | (9.607) | (10.345) |
| ROA | -0.0042 | 0.0487* | -0.0047 | 0.0023 | 0.0493* | 0.0072 |
| | (-0.069) | (1.799) | (-0.065) | (0.038) | (1.833) | (0.099) |
| Stock return | 0.0719*** | 0.1260*** | -0.0041 | 0.0793*** | 0.1272*** | 0.0073 |
| | (3.346) | (9.730) | (-0.123) | (3.655) | (9.661) | (0.220) |
| Stock return, t-1 | 0.1108*** | 0.0552*** | 0.0697*** | 0.1128*** | 0.0543*** | 0.0738*** |
| | (5.443) | (5.546) | (2.714) | (5.499) | (5.415) | (2.843) |
| Investment opportunities | -0.0115 | -0.0470*** | 0.0369 | -0.0220 | -0.0478*** | 0.0208 |
| | (-0.330) | (-2.928) | (0.831) | (-0.613) | (-2.941) | (0.456) |
| Stdev of ROA | 0.1323 | 0.2214*** | -0.0212 | 0.1506 | 0.2183*** | 0.0130 |
| | (0.828) | (2.790) | (-0.130) | (0.935) | (2.804) | (0.079) |
| Stdev of stock return | 0.0262 | -0.1131*** | 0.0009 | 0.0199 | -0.1109*** | -0.0095 |
| | (0.263) | (-3.293) | (0.008) | (0.197) | (-3.191) | (-0.083) |
| CEO tenure | -0.0156 | 0.0236*** | -0.1040*** | -0.0145 | 0.0245*** | -0.1018*** |
| | (-1.303) | (3.861) | (-6.820) | (-1.196) | (4.011) | (-6.615) |
| CEO-chair duality | 0.0350* | 0.0211** | 0.0420* | 0.0353* | 0.0200** | 0.0420 |
| | (1.693) | (2.240) | (1.651) | (1.681) | (2.088) | (1.629) |
| E-index | 0.0165 | 0.0244*** | 0.0034 | 0.0170 | 0.0256*** | 0.0031 |
| | (1.432) | (4.205) | (0.208) | (1.451) | (4.420) | (0.188) |
| Regulated | -0.0574 | 0.1730 | -0.0704 | -0.0624 | 0.1806 | -0.0786 |
| | (-0.318) | (1.006) | (-0.345) | (-0.345) | (1.038) | (-0.386) |
| Industry sales growth | 0.0628 | 0.2203*** | -0.0652 | 0.0536 | 0.2172*** | -0.0710 |
| | (0.717) | (4.965) | (-0.547) | (0.595) | (4.804) | (-0.580) |
| Totalpay, t-1 | 0.0618*** | | | 0.0623*** | | |
| | (2.844) | | | (2.831) | | |
| Totalpay, t-2 | 0.0197 | | | 0.0195 | | |
| | (1.192) | | | (1.156) | | |
| Cashpay, t-1 | | 0.2466*** | | | 0.2472*** | |
| | | (9.082) | | | (9.134) | |
| Cashpay, t-2 | | -0.0336 | | | -0.0334 | |
| | | (-1.436) | | | (-1.414) | |
| Equitypay, t-1 | | | -0.0021 | | | -0.0026 |
| | | | (-0.108) | | | (-0.131) |
| Equitypay, t-2 | | | 0.0254 | | | 0.0276* |
| | | | (1.568) | | | (1.691) |
| Observations | 13,518 | 13,518 | 13,518 | 13,285 | 13,285 | 13,285 |
| Adjusted R-squared | 0.683 | 0.739 | 0.532 | 0.682 | 0.739 | 0.532 |

**Table 5 GMM IV Estimation of Effects of M&A Intensity on CEO Compensation**

This table reports the coefficient estimates from the dynamic panel data GMM estimator, where two-step system GMM technique is employed. The definition of each variable is described in Exhibit 1. All nominal quantities are converted into 2002 dollars using the GDP deflator of the Bureau of Economic Analysis. All regressions include an intercept term and fiscal year dummies, but the respective estimates are not reported. Robust *t*-statistics adjusted for firm-level clustering are given in parenthesis under each coefficient estimate. Two-sided test significant at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively.

| VARIABLES | (1) Totalpay | (2) Cashpay | (3) Equitypay |
|---|---|---|---|
| Acquisition (intensity) | 0.1896*** | 0.0234 | 0.2757*** |
| | (2.668) | (0.719) | (3.032) |
| Firm size | 0.2681*** | 0.0908*** | 0.2390*** |
| | (7.042) | (6.955) | (6.289) |
| ROA | 0.0438 | 0.0752* | 0.0755 |
| | (0.646) | (1.687) | (0.831) |
| Stock return | -0.0008 | 0.1370*** | -0.1399*** |
| | (-0.017) | (8.472) | (-2.592) |
| Stock return, t-1 | 0.0458* | 0.0709*** | -0.0358 |
| | (1.833) | (4.742) | (-1.040) |
| Investment opportunities | 0.0878* | -0.0447** | 0.2200*** |
| | (1.919) | (-2.178) | (3.636) |
| Stdev of ROA | 0.0192 | 0.3914** | -0.3754 |
| | (0.094) | (2.527) | (-1.380) |
| Stdev of stock return | 0.1743 | -0.1622*** | 0.0997 |
| | (1.258) | (-2.971) | (0.555) |
| CEO tenure | -0.0559*** | 0.0449*** | -0.1408*** |
| | (-2.594) | (4.585) | (-4.065) |
| CEO-chair duality | 0.0253 | 0.0292** | -0.0243 |
| | (0.863) | (2.119) | (-0.647) |
| E-index | -0.0077 | 0.0319** | -0.0303 |
| | (-0.232) | (2.173) | (-0.713) |
| Regulated | -0.2853*** | -0.0924*** | -0.2960*** |
| | (-5.245) | (-4.172) | (-4.616) |
| Industry sales growth | 0.1879* | 0.1657*** | 0.3092** |
| | (1.690) | (3.381) | (2.228) |
| Totalpay, t-1 | 0.1990** | | |
| | (2.055) | | |
| Totalpay, t-2 | 0.0810*** | | |
| | (3.377) | | |
| Cashpay, t-1 | | 0.1885** | |
| | | (2.293) | |
| Cashpay, t-2 | | 0.0992** | |
| | | (2.029) | |
| Equitypay, t-1 | | | 0.1242 |
| | | | (1.438) |
| Equitypay, t-2 | | | 0.0809*** |
| | | | (3.721) |
| Observations | 13,285 | 13,285 | 13,285 |
| *F*-statistics | 42.75 | 62.45 | 28.64 |
| Prob. > *F* | 0.000 | 0.000 | 0.000 |
| AR(1) test (*p*-value) | 0.000 | 0.000 | 0.000 |
| AR(2) test (*p*-value) | 0.775 | 0.042 | 0.829 |
| Hansen test of over-identification (*p*-value) | 0.170 | 0.051 | 0.044 |
| Difference-in-Hansen test of exogeneity (*p*-value) | 0.355 | 0.130 | 0.102 |

**Table 6 Propensity Score Matching Analysis**

This table reports the results of the propensity score matching analysis. Panel A provides the average difference in the total compensation of the CEOs of acquiring and matched non-acquiring firms. Panel B provides these results for the broader (alternative) definition of M&A transactions. The definition of each variable is described in Exhibit 1. All nominal quantities are converted into 2002 dollars using the GDP deflator of the Bureau of Economic Analysis. Robust *t*-statistics adjusted for firm-level clustering are given in parenthesis under each coefficient estimate. Two-sided test significant at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively.

| Panel A. Propensity score matching estimation – Acquisition(active) | | |
|---|---|---|
| Matching estimator | (1) | (2) |
| | Propensity score matching | DID propensity score matching |
| Nearest neighbor (n= 10) | 0.0642*** | 0.0515*** |
| Nearest neighbor (n= 50) | 0.0700*** | 0.0562*** |
| Kernel – Gaussian | 0.0726*** | 0.0502*** |
| Kernel – Epanechnikov | 0.0657*** | 0.0528*** |
| | | |
| Panel B. Propensity score matching estimation – Acquisition(active) – alt. | | |
| Matching estimator | (1) | (2) |
| | Propensity score matching | DID propensity score matching |
| Nearest neighbor (n= 10) | 0.0320*** | 0.0301*** |
| Nearest neighbor (n= 50) | 0.0345*** | 0.0309*** |
| Kernel – Gaussian | 0.0338** | 0.0267*** |
| Kernel – Epanechnikov | 0.0315** | 0.0287*** |

**Table 7 The Role of Entrenchment and Free Cash-Flow Agency Costs**

This table reports the results from the firm fixed-effect regressions for the effect of CEO entrenchment and a firm's free cash flows on the relation between CEO compensation and M&A intensities. Long tenure is an indicator variable equaling 1 if the CEO's tenure is in the top quartile of all CEOs' tenure in the sample, and 0 otherwise. E-index= 5 or 6 is an indicator variable equaling 1 if a firm's E-index is equal to 5 or 6 in the year, and 0 otherwise. HiDCFLoDA is an indicator variable equaling 1 if a firm's discretionary cash flows is in the top quartile of all firms in the sample and its debt ratio is in the bottom quartile of all firms in the sample, and 0 otherwise. The measures of discretionary cash flow and debt ratio are followed from Titman, Wei, and Xie (2004). The definition of each variable is described in Exhibit 1. All nominal quantities are converted into 2002 dollars using the GDP deflator of the Bureau of Economic Analysis. All regressions include an intercept term and fiscal year dummies, but the respective estimates are not reported. Robust *t*-statistics adjusted for firm-level clustering are given in parenthesis under each coefficient estimate. Two-sided test significant at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively.

| VARIABLES | (1)<br>Totalpay | (2)<br>Cashpay | (3)<br>Equitypay | (4)<br>Totalpay | (5)<br>Cashpay | (6)<br>Equitypay |
|---|---|---|---|---|---|---|
| Acquisition (intensity) | 0.2168** | 0.0379 | 0.2850** | 0.2176*** | 0.0714** | 0.2963*** |
| | (2.431) | (0.936) | (2.449) | (3.313) | (2.386) | (3.297) |
| Long tenure × Acquisition(intensity) | -0.0029 | -0.0356 | 0.0681 | | | |
| | (-0.019) | (-0.456) | (0.305) | | | |
| CEO-chair duality × Acquisition(intensity) | -0.0976 | 0.0439 | -0.1092 | | | |
| | (-0.897) | (0.870) | (-0.785) | | | |
| (E-index = 5 or 6) × Acquisition(intensity) | 0.4030 | -0.2642*** | 0.2939 | | | |
| | (1.109) | (-3.151) | (0.616) | | | |
| HiDCFLoDA × Acquisition(intensity) | | | | -0.2107* | -0.0738 | -0.2389 |
| | | | | (-1.781) | (-1.398) | (-1.623) |
| Firm size | 0.3072*** | 0.0987*** | 0.3177*** | 0.3077*** | 0.0988*** | 0.3181*** |
| | (12.217) | (9.599) | (10.354) | (12.243) | (9.587) | (10.367) |
| ROA | 0.0035 | 0.0486* | 0.0089 | 0.0018 | 0.0491* | 0.0066 |
| | (0.057) | (1.812) | (0.122) | (0.030) | (1.824) | (0.091) |
| Stock return | 0.0790*** | 0.1274*** | 0.0070 | 0.0790*** | 0.1270*** | 0.0070 |
| | (3.638) | (9.671) | (0.209) | (3.648) | (9.656) | (0.210) |
| Stock return, t-1 | 0.1125*** | 0.0545*** | 0.0736*** | 0.1128*** | 0.0543*** | 0.0738*** |
| | (5.480) | (5.425) | (2.834) | (5.502) | (5.418) | (2.846) |
| Investment opportunities | -0.0212 | -0.0480*** | 0.0209 | -0.0206 | -0.0473*** | 0.0224 |
| | (-0.591) | (-2.940) | (0.458) | (-0.576) | (-2.887) | (0.491) |
| Stdev of ROA | 0.1522 | 0.2176*** | 0.0151 | 0.1461 | 0.2168*** | 0.0080 |
| | (0.948) | (2.787) | (0.091) | (0.898) | (2.755) | (0.048) |
| Stdev of stock return | 0.0196 | -0.1107*** | -0.0099 | 0.0195 | -0.1111*** | -0.0100 |
| | (0.194) | (-3.179) | (-0.086) | (0.193) | (-3.197) | (-0.087) |
| CEO tenure | -0.0144 | 0.0246*** | -0.1021*** | -0.0144 | 0.0246*** | -0.1017*** |
| | (-1.180) | (4.014) | (-6.581) | (-1.191) | (4.014) | (-6.612) |
| CEO-chair duality | 0.0370* | 0.0193** | 0.0440* | 0.0357* | 0.0201** | 0.0424 |
| | (1.746) | (2.015) | (1.696) | (1.697) | (2.100) | (1.644) |
| E-index | 0.0166 | 0.0259*** | 0.0028 | 0.0168 | 0.0255*** | 0.0029 |
| | (1.413) | (4.463) | (0.168) | (1.436) | (4.412) | (0.176) |
| Regulated | -0.0632 | 0.1809 | -0.0791 | -0.0648 | 0.1798 | -0.0813 |
| | (-0.349) | (1.039) | (-0.389) | (-0.359) | (1.032) | (-0.400) |
| Industry sales growth | 0.0560 | 0.2163*** | -0.0692 | 0.0553 | 0.2178*** | -0.0690 |
| | (0.624) | (4.786) | (-0.566) | (0.615) | (4.819) | (-0.565) |
| Totalpay, t-1 | 0.0624*** | | | 0.0625*** | | |
| | (2.835) | | | (2.838) | | |
| Totalpay, t-2 | 0.0198 | | | 0.0196 | | |
| | (1.176) | | | (1.161) | | |
| Cashpay, t-1 | | 0.2471*** | | | 0.2472*** | |
| | | (9.132) | | | (9.131) | |
| Cashpay, t-2 | | -0.0331 | | | -0.0333 | |
| | | (-1.400) | | | (-1.411) | |
| Equitypay, t-1 | | | -0.0026 | | | -0.0024 |
| | | | (-0.130) | | | (-0.118) |
| Equitypay, t-2 | | | 0.0279* | | | 0.0277* |
| | | | (1.709) | | | (1.695) |
| Observations | 13,285 | 13,285 | 13,285 | 13,285 | 13,285 | 13,285 |
| Adjusted R-squared | 0.682 | 0.739 | 0.532 | 0.683 | 0.739 | 0.532 |

**Table 8 Effects of Recent Stock Return Performance on CEO compensation and M&A Activity**

Panel A reports the average CEO compensation and M&A measures sorted by quintiles of stock raw return in the prior year. Panel B provides the average of percentage change in the compensation measures double sorted by quintiles of stock raw return in the prior year and of the M&A intensity. Panel C gives the average compensation measures double sorted by quintiles of stock raw return in the prior year and of the M&A intensity. The definition of each variable is described in Exhibit 1. All nominal quantities are converted into 2002 dollars using the GDP deflator of the Bureau of Economic Analysis.

Panel A. Compensation and M&A Measures Sorted by Quintiles of Stock Raw Return in t-1

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Totalpay | 1.181 | 1.309 | 1.415 | 1.445 | 1.490 |
| Cashpay | 0.620 | 0.728 | 0.786 | 0.816 | 0.788 |
| Equitypay | 0.728 | 0.781 | 0.860 | 0.877 | 0.983 |
| Acquisition(amount) | 0.398 | 0.557 | 0.609 | 0.732 | 0.827 |
| Acquisition(intensity) | 0.015 | 0.017 | 0.017 | 0.023 | 0.040 |
| Acquisition(amount: by stock) | 2.333 | 2.185 | 2.429 | 2.592 | 3.191 |
| Acquisition(amount: by cash) | 2.140 | 2.537 | 2.306 | 2.366 | 1.794 |
| Acquisition(intensity: by stock) | 0.094 | 0.066 | 0.067 | 0.090 | 0.169 |
| Acquisition(intensity: by cash) | 0.056 | 0.068 | 0.048 | 0.054 | 0.053 |

Panel B. Changes in Compensation Sorted by Quintiles of Stock Raw Return in t-1 and M&A Intensity

| **Changes in Totalpay** | Quintile: Acquisition(intensity) | | | | |
|---|---|---|---|---|---|
| Quintiles: stock raw return (t-1) | 1 | 2 | 3 | 4 | 5 |
| 1 | -0.1602 | -0.1013 | 0.0296 | -0.1232 | -0.0167 |
| 2 | -0.0814 | 0.0419 | 0.0441 | 0.0360 | 0.1755 |
| 3 | 0.1039 | 0.0744 | 0.0562 | 0.1555 | 0.1114 |
| 4 | 0.0088 | 0.0189 | -0.0093 | 0.0444 | 0.1227 |
| 5 | 0.1316 | 0.0217 | 0.2075 | 0.1862 | 0.2012 |
| **Changes in Cashpay** | Quintile: Acquisition(intensity) | | | | |
| Quintiles: stock raw return (t-1) | 1 | 2 | 3 | 4 | 5 |
| 1 | 0.0100 | 0.0150 | 0.0065 | 0.0026 | 0.0490 |
| 2 | -0.1156 | -0.0416 | -0.0313 | -0.0581 | 0.0129 |
| 3 | -0.0412 | -0.0295 | -0.0196 | 0.0007 | 0.0355 |
| 4 | -0.0243 | -0.0119 | -0.0576 | -0.0270 | 0.0179 |
| 5 | -0.0303 | -0.0037 | 0.0275 | -0.0214 | 0.0401 |
| **Changes in Equitypay** | Quintile: Acquisition(intensity) | | | | |
| Quintiles: stock raw return (t-1) | 1 | 2 | 3 | 4 | 5 |
| 1 | -0.2194 | -0.1545 | 0.0041 | -0.1520 | -0.0395 |
| 2 | -0.0539 | 0.0676 | 0.0114 | 0.0623 | 0.2174 |
| 3 | 0.1661 | 0.0963 | 0.1052 | 0.2356 | 0.0866 |
| 4 | 0.0163 | 0.0325 | 0.0193 | 0.1052 | 0.1633 |
| 5 | 0.2261 | 0.0097 | 0.2024 | 0.2832 | 0.2329 |

| Panel C. Compensation Sorted by Quintiles of Stock Raw Return in t-1 and M&A Intensity | | | | | |
|---|---|---|---|---|---|
| **Totalpay** | Quintiles: Acquisition(intensity) | | | | |
| Quintiles: stock raw return (t-1) | 1 | 2 | 3 | 4 | 5 |
| 1 | 1.7363 | 1.5057 | 1.4645 | 1.5171 | 1.4165 |
| 2 | 1.6011 | 1.5913 | 1.6354 | 1.4885 | 1.5527 |
| 3 | 1.7131 | 1.6895 | 1.5521 | 1.5780 | 1.6361 |
| 4 | 1.9014 | 1.6625 | 1.6224 | 1.5174 | 1.6386 |
| 5 | 1.9876 | 1.6012 | 1.7863 | 1.7718 | 1.8558 |
| **Cashpay** | Quintiles: Acquisition(intensity) | | | | |
| Quintiles: stock raw return (t-1) | 1 | 2 | 3 | 4 | 5 |
| 1 | 0.8975 | 0.7208 | 0.7618 | 0.7349 | 0.7189 |
| 2 | 0.8466 | 0.7656 | 0.8303 | 0.7755 | 0.7522 |
| 3 | 0.9382 | 0.9017 | 0.8334 | 0.7976 | 0.8350 |
| 4 | 1.1516 | 0.9268 | 0.8805 | 0.7979 | 0.8793 |
| 5 | 1.1138 | 0.8797 | 0.8647 | 0.7968 | 0.8070 |
| **Equitypay** | Quintiles: Acquisition(intensity) | | | | |
| Quintile: stock raw return (t-1) | 1 | 2 | 3 | 4 | 5 |
| 1 | 1.2382 | 1.0581 | 1.0062 | 1.0716 | 0.9717 |
| 2 | 1.0618 | 1.1169 | 1.0858 | 1.0198 | 1.1365 |
| 3 | 1.1404 | 1.0935 | 1.0194 | 1.1475 | 1.1172 |
| 4 | 1.2147 | 1.1024 | 1.0849 | 0.9952 | 1.1289 |
| 5 | 1.4066 | 1.1118 | 1.3039 | 1.3789 | 1.4670 |

**Table 9 Effects of Recent Industry-Adjusted Stock Return Performance on CEO Compensation and M&A Intensity**

Panel A reports the average CEO compensation and M&A measures sorted by quintiles of the recent industry-adjusted stock return performance. Panel B provides the average of percentage change in the compensation measures double sorted by quintiles of the recent industry-adjusted stock return performance and of the M&A intensity. Panel C gives the average compensation measures double sorted by quintiles of the recent industry-adjusted stock return performance and of the M&A intensity. The definition of each variable is described in Exhibit 1. All nominal quantities are converted into 2002 dollars using the GDP deflator of the Bureau of Economic Analysis.

| Panel A. Compensation and M&A Measures Sorted by Quintiles of Industry-Adjusted Stock Return in t-1 | | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| Totalpay | 1.240 | 1.365 | 1.414 | 1.465 | 1.491 |
| Cashpay | 0.668 | 0.755 | 0.784 | 0.804 | 0.765 |
| Equitypay | 0.769 | 0.825 | 0.853 | 0.910 | 1.012 |
| Acquisition(amount) | 0.440 | 0.612 | 0.697 | 0.654 | 0.742 |
| Acquisition(intensity) | 0.015 | 0.016 | 0.019 | 0.021 | 0.033 |
| Below includes acquirers only | | | | | |
| Acquisition(amount: by stock) | 0.171 | 0.280 | 0.316 | 0.267 | 0.395 |
| Acquisition(amount: by cash) | 0.207 | 0.240 | 0.294 | 0.304 | 0.276 |
| Acquisition(intensity: by stock) | 0.070 | 0.061 | 0.059 | 0.078 | 0.163 |
| Acquisition(intensity: by cash) | 0.070 | 0.051 | 0.057 | 0.059 | 0.051 |

| Panel B. Changes in Compensation Sorted by Quintiles of Industry-Adjusted Stock Return in t-1 and M&A Intensity | | | | | |
|---|---|---|---|---|---|
| **Changes in Totalpay** | Quintile: Acquisition(intensity) | | | | |
| Quintile: industry-adjusted stock return (t-1) | 1 | 2 | 3 | 4 | 5 |
| 1 | -0.0721 | -0.0699 | -0.0099 | -0.0332 | 0.0553 |
| 2 | -0.0114 | 0.0248 | 0.0049 | 0.0209 | 0.0351 |
| 3 | 0.0544 | 0.0448 | 0.0130 | 0.0197 | 0.1590 |
| 4 | 0.0341 | 0.0665 | 0.0853 | 0.1607 | 0.1700 |
| 5 | 0.0140 | -0.0165 | 0.2059 | 0.1603 | 0.1457 |
| **Changes in Cashpay** | Quintile: Acquisition(intensity) | | | | |
| Quintile: industry-adjusted stock return (t-1) | 1 | 2 | 3 | 4 | 5 |
| 1 | -0.0084 | 0.0955 | 0.0051 | 0.0419 | 0.0928 |
| 2 | -0.0198 | -0.0510 | -0.0397 | -0.0376 | 0.0575 |
| 3 | -0.1008 | -0.0625 | -0.0480 | -0.0287 | 0.0173 |
| 4 | -0.0693 | 0.0011 | -0.0087 | -0.0527 | 0.0111 |
| 5 | -0.0177 | -0.0313 | -0.0382 | -0.0264 | 0.0167 |
| **Changes in Equitypay** | Quintile: Acquisition(intensity) | | | | |
| Quintile: industry-adjusted stock return (t-1) | 1 | 2 | 3 | 4 | 5 |
| 1 | -0.0614 | -0.1302 | -0.0413 | -0.0815 | 0.0086 |
| 2 | -0.0059 | 0.0581 | -0.0489 | 0.0529 | 0.0218 |
| 3 | 0.1452 | 0.0757 | 0.0314 | 0.0818 | 0.2345 |
| 4 | 0.0609 | 0.0834 | 0.1427 | 0.2532 | 0.1777 |
| 5 | 0.0235 | -0.0202 | 0.2584 | 0.2672 | 0.1845 |

| Panel C. Compensation Sorted by Quintiles of Industry-Adjusted Stock Return in t-1 and M&A Intensity | | | | | |
|---|---|---|---|---|---|
| **Totalpay** | Quintile: Acquisition(intensity) | | | | |
| Quintile: industry-adjusted stock return (t-1) | 1 | 2 | 3 | 4 | 5 |
| 1 | 1.7133 | 1.6135 | 1.5863 | 1.5070 | 1.4039 |
| 2 | 1.6541 | 1.5805 | 1.5286 | 1.5675 | 1.6580 |
| 3 | 1.8052 | 1.6753 | 1.5874 | 1.5824 | 1.6997 |
| 4 | 1.9739 | 1.6264 | 1.6905 | 1.7020 | 1.6905 |
| 5 | 2.1474 | 1.8485 | 1.8113 | 1.8166 | 1.9638 |
| **Cashpay** | Quintile: Acquisition(intensity) | | | | |
| Quintile: industry-adjusted stock return (t-1) | 1 | 2 | 3 | 4 | 5 |
| 1 | 0.9347 | 0.8528 | 0.8170 | 0.7732 | 0.6970 |
| 2 | 0.9357 | 0.7808 | 0.8121 | 0.8294 | 0.8786 |
| 3 | 0.9838 | 0.8889 | 0.8342 | 0.7955 | 0.7907 |
| 4 | 1.0849 | 0.8707 | 0.9274 | 0.8145 | 0.8832 |
| 5 | 1.1891 | 0.9533 | 0.8295 | 0.8474 | 0.8977 |
| **Equitypay** | Quintile: Acquisition(intensity) | | | | |
| Quintile: industry-adjusted stock return (t-1) | 1 | 2 | 3 | 4 | 5 |
| 1 | 1.1883 | 1.1105 | 1.1462 | 1.0429 | 0.9813 |
| 2 | 1.0646 | 1.0708 | 0.9637 | 1.0875 | 1.1697 |
| 3 | 1.2205 | 1.1131 | 1.0101 | 1.0850 | 1.2774 |
| 4 | 1.4050 | 1.0720 | 1.1213 | 1.2620 | 1.0688 |
| 5 | 1.5419 | 1.4004 | 1.3962 | 1.3957 | 1.5811 |

**Table 10 Method of Deal Financing and the Relation of M&A Intensity to CEO Compensation**

This table reports the coefficient estimates from the firm fixed effects regressions of CEO compensation on M&A intensity separated by the primary method of deal financing. The definition of each variable is described in Exhibit 1. All nominal quantities are converted into 2002 dollars using the GDP deflator of the Bureau of Economic Analysis. All regressions include an intercept term and firm and fiscal year dummies, but the respective estimates are not reported. Robust *t*-statistics adjusted for firm-level clustering are given in parenthesis under each coefficient estimate. Two-sided test significant at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively.

| VARIABLES | (1) Totalpay | (2) Cashpay | (3) Equitypay |
|---|---|---|---|
| Acquisition(intensity: by stock) | 0.2119** | 0.0623* | 0.2912*** |
| | (2.489) | (1.801) | (2.795) |
| Acquisition(intensity: by cash) | 0.0127 | 0.0245 | 0.0919 |
| | (0.099) | (0.501) | (0.498) |
| Firm size | 0.3130*** | 0.0983*** | 0.3225*** |
| | (11.720) | (8.856) | (9.883) |
| ROA | 0.0073 | 0.0379 | 0.0251 |
| | (0.115) | (1.439) | (0.334) |
| Stock return | 0.0837*** | 0.1211*** | 0.0170 |
| | (3.643) | (9.223) | (0.483) |
| Stock return, t-1 | 0.1087*** | 0.0498*** | 0.0740*** |
| | (5.106) | (4.935) | (2.728) |
| Investment opportunities | -0.0301 | -0.0366** | 0.0047 |
| | (-0.824) | (-2.129) | (0.101) |
| Stdev of ROA | 0.1891 | 0.1974*** | 0.0793 |
| | (1.093) | (2.585) | (0.453) |
| Stdev of stock return | -0.0035 | -0.1133*** | -0.0401 |
| | (-0.034) | (-3.343) | (-0.337) |
| CEO tenure | -0.0174 | 0.0257*** | -0.1044*** |
| | (-1.325) | (3.887) | (-6.296) |
| CEO-chair duality | 0.0387* | 0.0241** | 0.0399 |
| | (1.738) | (2.349) | (1.489) |
| E-index | 0.0218* | 0.0262*** | 0.0070 |
| | (1.810) | (4.027) | (0.419) |
| Regulated | -0.0432 | 0.2383 | -0.0846 |
| | (-0.228) | (1.310) | (-0.377) |
| Industry sales growth | 0.0242 | 0.2064*** | -0.1012 |
| | (0.251) | (4.226) | (-0.759) |
| Totalpay, t-1 | 0.0523** | | |
| | (2.519) | | |
| Totalpay, t-2 | 0.0190 | | |
| | (1.074) | | |
| Cashpay, t-1 | | 0.2316*** | |
| | | (8.412) | |
| Cashpay, t-2 | | -0.0278 | |
| | | (-1.132) | |
| Equitypay, t-1 | | | -0.0038 |
| | | | (-0.181) |
| Equitypay, t-2 | | | 0.0259 |
| | | | (1.457) |
| Observations | 11,885 | 11,885 | 11,885 |
| Adjusted R-squared | 0.683 | 0.744 | 0.535 |

**Table 11 Effects of SFAS 141 on the Relation of M&A Intensity to CEO Compensation**

This table gives the results from the dynamic pooled OLS regressions of the effects of the passage of SFAS 141 on the relation of M&A intensity separated by the primary method of the deal financing to CEO compensation. The definition of each variable is described in Exhibit 1. All nominal quantities are converted into 2002 dollars using the GDP deflator of the Bureau of Economic Analysis. All regressions include an intercept term and fiscal year dummies, but the respective estimates are not reported. Robust *t*-statistics adjusted for firm-level clustering are given in parenthesis under each coefficient estimate. Two-sided test significant at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively.

| VARIABLES | (1) Totalpay | (2) Cashpay | (3) Equitypay |
|---|---|---|---|
| Acquisition(intensity: by stock) | 0.4326*** | 0.0652* | 0.5832*** |
| | (4.988) | (1.779) | (5.471) |
| SFAS141×Acquisition(intensity: by stock) | -0.2962** | -0.0147 | -0.3010* |
| | (-2.213) | (-0.238) | (-1.788) |
| Acquisition(intensity: by cash) | 0.3453* | 0.0922 | 0.4395* |
| | (1.891) | (1.379) | (1.787) |
| SFAS141×Acquisition(intensity: by cash) | -0.2362 | -0.0263 | -0.2141 |
| | (-1.011) | (-0.308) | (-0.677) |
| SFAS141 | 0.0856*** | 0.0742*** | 0.1622*** |
| | (3.730) | (7.046) | (5.130) |
| Firm size | 0.1399*** | 0.0439*** | 0.1637*** |
| | (17.535) | (13.213) | (20.253) |
| ROA | -0.0264 | -0.0014 | 0.0082 |
| | (-0.565) | (-0.083) | (0.138) |
| Stock return | 0.1578*** | 0.1407*** | 0.0749*** |
| | (9.324) | (11.249) | (3.233) |
| Stock return, t-1 | 0.1438*** | 0.0383*** | 0.1070*** |
| | (8.083) | (4.981) | (4.946) |
| Investment opportunities | 0.0263 | -0.0297*** | 0.1003*** |
| | (1.577) | (-3.825) | (4.417) |
| Stdev of ROA | 0.1231* | 0.0699*** | 0.1531* |
| | (1.668) | (2.590) | (1.710) |
| Stdev of stock return | 0.1579*** | -0.0037 | 0.2552*** |
| | (3.965) | (-0.202) | (5.203) |
| CEO tenure | -0.0161** | 0.0131*** | -0.0600*** |
| | (-2.249) | (3.737) | (-6.694) |
| CEO-chair duality | 0.0480*** | 0.0277*** | 0.0264** |
| | (4.417) | (5.077) | (1.969) |
| E-index | 0.0044 | 0.0001 | 0.0024 |
| | (1.187) | (0.061) | (0.494) |
| Regulated | -0.1526*** | -0.0390*** | -0.2013*** |
| | (-9.847) | (-4.904) | (-10.379) |
| Industry sales growth | 0.1352* | 0.1979*** | 0.0922 |
| | (1.873) | (5.882) | (0.996) |
| Totalpay, t-1 | 0.3441*** | | |
| | (22.365) | | |
| Totalpay, t-2 | 0.2535*** | | |
| | (16.044) | | |
| Cashpay, t-1 | | 0.5093*** | |
| | | (27.789) | |
| Cashpay, t-2 | | 0.1890*** | |
| | | (9.684) | |
| Equitypay, t-1 | | | 0.2556*** |
| | | | (16.843) |
| Equitypay, t-2 | | | 0.2333*** |
| | | | (16.132) |
| Observations | 11,885 | 11,885 | 11,885 |
| Adjusted R-squared | 0.633 | 0.702 | 0.474 |