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Pay Increase May not be a Strong Incentive for Undertaking Acquisitions: Evidence of Survivor Bias in Post-Acquisition CEO Pay

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Abstract

A large body of literature suggests that CEOs have misaligned incentives to undertake acquisitions in an attempt to increase their pay. This paper shows that the likelihood of post-acquisition CEO turnover can act as a constraint on such incentives. The acquisition premium in pay decreases by 50% if the likelihood of post-acquisition turnover is controlled for. This suggests a significant survivor bias in previous estimates of acquisition premium. Given a smaller pay premium for undertaking acquisitions and non-zero risk of dismissal, a risk-averse agent may not have strong incentives to undertake an acquisition for the marginal pay increase. The likelihood of dismissal seems to carry stronger incentive effects than post-acquisition pay increase.

KEY WORDS: Agency Problem, Mergers and Acquisitions, CEO pay, Severance

JEL Codes: G34, J31, J33, M52

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1 Introduction

A widely held proposition in finance and economics literature is that acquisition activities are detrimental to the shareholders wealth and profitability of the acquiring firms (Dickerson *et al.* 1997; Loghran and Vijh, 1997). Yet, in the last two decades there has been at least two periods of heightened acquisition activities in the US. It is conjectured that acquisitions are motivated more by managerial incentives to increase firm size and to a lesser extent by considerations for shareholder value (Jensen, 1986). This is motivated by the empirical literature on executive pay, which suggests that the pay-size relationship dominates the pay-performance sensitivity (Bebchuk and Fried 2003; Bliss and Rosen, 2001; Gabaix and Landier 2008; Murphy 1999).

If pay is strongly associated with firm size, then increasing the size of the firm provides the CEO with a viable option to increase her own pay, even if it is at the cost of shareholders' wealth. A higher firm size, along with tangible benefits to CEO wealth, also generates several non-pecuniary benefits to the CEO in terms of perquisites and lowering of the probability of her own firm getting acquired. One way to increase the firm size is to undertake acquisitions. This may incentivize a utility maximizing CEO to undertake acquisitions which may not be in the interests of the shareholders. Completions of acquisitions also serve as signals of managerial ability and may have an impact on the long term earnings of the CEO (Williamson 1963; Singh 1975).

Specifically, this paper asks whether the threat of post-acquisition dismissal constrains the CEO in maximizing utility through the acquisition-premium in pay. Whilst share options are designed to provide disincentives to undertake bad acquisitions, Harford and Li (2007) find that these are largely ineffective as a constraint. Lehn and Zhao (2006) find that 47% of CEOs of acquiring firms are replaced within 5 years of acquisition and that CEOs are more likely to be terminated if the ex-post financial outcome of the turnover destroys shareholders' wealth. The likelihood of dismissal should

constrain the misaligned incentives of the CEO; higher the probability of post-acquisition dismissal, lower is the incentive of a risk-averse CEO to undertake an acquisition unless the wage premium is large enough to offset the cost of dismissal. Given that the agent has imperfect information of the *ex-post* likelihood of dismissal, the implied probability of dismissal may have strong disincentive effects for undertaking acquisitions.

Extant literature does not control for the likelihood of CEO turnover in estimating the acquisition premium in CEO pay. Harford and Li (2007) allude to the possibility of survivor bias in the estimates of the acquisition premium in pay which arises from the commonly used empirical strategy to use a "sample of bidding firms whose CEOs remained in place through at least 1 year following the acquisition". The rationale for such a strategy is that if a CEO is dismissed following an acquisition, a new CEO is more likely to have a higher pay and consequently the pay-premium may be over-estimated (Murphy and Zabonjik, 2009). However, the exclusion of CEOs who lose their job following an acquisition may induce a survivor bias in the estimates of the pay-premium. If the acquisition premium in CEO pay is a manifestation of agency problem, then the threat of dismissal should act as a constraint for undertaking risky acquisitions.

This paper controls for the likelihood of post-acquisition dismissal using a Heckman-type selection model. The median *ex-ante* change in control pay eligibility within the same industry group [1] is used as an exclusion restriction. The central idea is that a higher eligibility of change in control pay within the same industry group will impact upon the likelihood of dismissal of an individual CEO but not on pay. The data employed overlaps with two merger waves: 1992-2000 and 2003-2008. The key facets of the 1992-3003 and the 2003-2008 waves were surge in cross-border

[1] The change in control pay is the ex-ante contracted eligibility of the CEO to receive a separation pay in the event of dismissal following an acquisition. The exclusion restriction is the median eligibility of this pay within a 2-digit industry classification. This is discussed in further details in sections 2&3.

acquisitions and shareholder activism respectively. This paper uses information on the nationality of the target firms and the characteristics of the board of directors to answer new questions related to managerial incentives in undertaking acquisitions.

This paper contributes to the empirical literature examining the managerial incentives of undertaking acquisitions. For a sample of 953 acquisitions undertaken by 932 US firms over the period 1993-2011, this paper examines the effect of the dismissal constraint on a CEO's objective of increasing pay by undertaking acquisitions. The empirical evidence on whether acquisitions lead to a pay increase for the CEO is inconclusive. Some studies find that the CEOs of acquiring firms enjoy a post-acquisition pay premium. Khorana and Zenner (1998) reports that the CEO of an acquiring firm enjoys receives a10.5% pay premium compared to a CEO in a comparable firm not undertaking an acquisition. The pay premium following an acquisition seemingly persists over time. More recently, Harford and Li (2007) find that the US CEOs enjoy a post-acquisition premium in pay. Girma, Thompson and Wright (2006) report a "pure" positive acquisition premium in the pay of UK CEOs. The post-acquisition premium in pay has been attributed to the signaling effect of managerial ability that is manifest in completion of acquisitions.

This paper suggests that if the likelihood of dismissal is accounted for, CEOs engaging in value-destroying acquisitions are likely to suffer a pay penalty. The empirical evidence on differential pay awards for good and bad acquisitions is mixed. Lambert and Larcker (1987) and Girma et al. (2006) find that CEOs engaging in bad acquisitions experience lower pay compared to CEOs engaging in good acquisitions. In contrast, Guest (2009) finds a positive acquisition effect on CEO pay irrespective of the effect it has on shareholders' wealth and that corporate governance doesn't have a significant impact on post-acquisition CEO pay. He also finds no evidence of differential pay awards for UK CEOs who undertake cross-border acquisitions. In contrast, Ozkan (2012) finds

that CEOs foreign acquisitions lead to a higher premium in CEO pay.

Extant literature focus only on the pay incentives of CEOs to undertake acquisitions. In contrast, this is the first study to examine the incentive effects of post-acquisition dismissal probability on acquisition decisions. We also examine whether the reported pay-premium for CEOs engaging in value-destroying acquisitions can be accounted for if the likelihood of dismissal is controlled for. Moreover, the literature on the pay premium for acquiring US CEOs do not include and/or examine the difference between cross-border and domestic acquisitions. Given an increasing proportion of cross-border acquisitions in the US (Conn et al. 2005), this paper examines the incentives of CEOs to engage in cross-border acquisitions.

CEO dismissal decisions may not be based solely on the stock market reaction to the announcement of the acquisitions. A further innovation of this paper is that we seek to use a longer term metric to classify 'wealth enhancing' and 'wealth reducing' effects of acquisitions. This allows us to extend the horizon of the impact of an acquisition on shareholders wealth beyond the announcement effect.

The empirical strategy of this paper is designed to test the incentive alignment hypothesis. The central focus of this paper is to examine the interplay of the incentive effects of the risk of post-acquisition dismissal and a pay premium. If the threat of dismissal bears a disincentive effect on the managerial decisions to undertake acquisitions, then the risk adjusted premium in CEO pay will be much lower than the previous estimates. Further, the dismissal risk should be higher for CEOs engaging in value-destroying acquisitions. Thus the risk-adjusted pay premium needs to be much larger for the CEO to be motivated in undertaking a risky acquisition. We examine how the probability of dismissal impacts upon the pay premium in events of value-destroying acquisitions. We also investigate the role of the structure and composition of the board of directors on the

incentive effects of undertaking acquisitions.

Controlling for the likelihood of post-acquisition dismissal, the pay premium for acquiring CEOs are reduced by over 50%. The fixed effect estimate of a pay premium of 4% is consistent with the previous findings of Bliss and Rosen (2001) and Harford and Li (2007) but the premium is reduced to 1.6% after controlling for dismissal probability. By documenting the effect of dismissal risk on the acquisition premium in CEO pay, this paper extends the work of Lehn and Zhao (2006). Whilst the results of this paper still suggest a small premium in pay for undertaking acquisitions, a risk-averse agent may not have sufficient incentives to undertake an acquisition for a marginal increase in pay given the finite risk of dismissal. Given that acquiring CEOs in our sample are 35% more likely to be dismissed, the value of the pay-off for the CEO is likely to be much lesser if the risk-appetite is accounted for.

The survival-bias seems to be systematically present in both the cash and equity components of pay. This extends on the study by Grinstein and Hribar (2004) who find that the acquisition premium in pay is driven by large bonuses. We find evidence of survivor bias in the bonus payouts. There seems to be no pay premium for CEOs undertaking value-destroying acquisitions, in fact they suffer a pay penalty of 2.1%. This suggests lower incentives for CEOs to undertake risky acquisitions as it leads to both higher dismissal probability and a pay penalty.

If a long-term metric of performance is employed to classify ex-post outcomes of acquisitions, the premium in pay for acquiring CEOs is further reduced to about 1% and there is no significant impact of acquisition on bonuses. Acquisitions that have a long term negative impact on shareholders' wealth lead to a 3% decrease in CEO pay. Finally, there is no evidence of differential pay award for undertaking cross-border acquisitions.

The paper is structured as follows: Section 2 describes the data; Section 3 examines the method-

ological issues and the empirical strategy. The results are presented in Section 4 and Section 5 concludes.

2 Data

The data used in this analysis are derived from Compustat's ExecuComp database. For the sample period 1993-2011, we use information on 2755 firms from the S&P 1500 listings. Descriptions of key variables are provided in Table 1. Annual CEO pay is calculated as the sum of the salary, bonus, stock option grants, restricted stock units, long-term incentives and other payments. Summary statistics of the key variables is presented in Table 2.

Events of CEO dismissals are identified from the Execucomp database, Fortune 500 and Fortune 1000 lists, the Wall Street Journal and Lexis/Nexis Business news database. Consistent with the definition used by Huson, Malatesta and Parrino (2004), turnover means that a CEO who is observed in a firm on October 1st of year y is not observed in the same firm on the same day of year $y+1$.[2] Classifying dismissal is difficult as firms rarely state that they have fired the CEO. Events of dismissals are identified from the press reports that the CEO was fired, forced out or has resigned due to internal pressures. Cases where CEOs vacate their post but continue as the chairman of the board are not treated as dismissal. Robustness of the classification technique was performed using an age-based algorithm: CEOs who are less than 55 years of age and leave their jobs following an acquisition are classified as dismissal. This method yields similar number of dismissals to the original method. However, using an age-based classification is likely to over-estimate the probability of dismissal below the threshold and underestimate otherwise. This might potentially bias the estimates and hence the original classification technique is retained.

Information on stock price performance is obtained from the Centre for Research in Securities

[2] We use October-September cycle to overlap with the DEF 14 A filing cycles.

Prices (CRSP). The annual average value weighted return for a firm is benchmarked to the average annual value weighted return of the median firm in the same 2-digit SIC code. Natural log of total assets is used as a measure of firm size. Further, the risk in a firm's operating and information environment is controlled for using the volatility in annual average stock returns.

Corporate governance data was obtained from the Risk Metrics database (formerly IRRC). Corporate governance data are available for 1996-2011 and hence specifications with corporate governance controls contain fewer observations.

KEY VARIABLES:

Retention

Retention is a binary indicator for a CEO retaining his job for at least two years following an acquisition. Of the 932 firms engaging in acquisitions over the sample period, 431 (46.24%) dismiss the acquiring CEO within the first two years of an acquisition[3]. In the same period, only 332 (18.21%) of 1823 firms dismiss the CEO. The raw data suggests a higher probability of CEO turnover in acquiring firms. There may be a concern that acquiring firms and firms that dismiss the CEO following an acquisition may be different on some observable characteristics. To attenuate this concern, the summary statistics for key variables are presented in Table 3 by firms that experience post-acquisition CEO dismissal and firms that don't. The crude statistics suggest that acquiring firms, on the average, are larger than the non-acquiring firms. In periods following an acquisition, CEO pay in acquiring firms is 53.9% higher than the CEO pay before the acquisition. However, there is a decrease in the acquiring firm's profitability after undertaking an acquisition.

Change in Control Payment Eligibility

Change in control payment eligibility is the *ex-ante* contracted eligibility of the CEO to receive

[3]The number of post-acquisition dismissals is 443 if the age-based algorithm to classify dismissals is employed.

a sum of pay in the event of a dismissal following an acquisition. This was instituted in the 1980s to encourage risk-taking among CEOs in the interests of the shareholder, even if it endangers their jobs. This is a one-off payment agreed upon at the beginning of the CEO's tenure. However, this is not a regulatory requirement for firms to have change in control payment. Execucomp provides information on the change in control payment eligibility of CEOs. Care has been taken to verify and augment such reporting from the DEF-14A filings of firms for each year of a new CEO appointment. 57% of the sample firms provide the CEOs with an ex-ante agreed eligibility of change in control pay.[4] For the purpose of this analysis, we estimate the median change in control pay for industries at 2-digit SIC levels.

Acquisitions

Events of acquisitions are identified from Acquisition Weekly Thomson One Banker and Forbes company database. In the sample period 8247 acquisitions are reported for the sample of firms obtained from Execucomp.[5] Following the selection method of Lehn and Zhao (2006), the sample is selected using the following criteria: (a) acquisitions announced between January, 1, 1992 and December, 31, 2010; (b) deals are "completed"; (c) both target and acquiring firms are publicly listed; and (d) the size of the target firm is at least 10% that of the acquiring firm.

A materiality constraint of non-overlapping acquisitions was necessary to isolate the lagged effects of individual acquisitions on CEO pay where a sample firm undertakes multiple closely spaced acquisitions. An overlap is defined as a gap of less than 24 months between the announcements of two acquisitions. [6].

[4] A probit test was performed to check the nature of prevalence of the change in control pay eligibility. There is insufficient evidence to suggest that firms that provide a contractual change in control pay eligibility are systematically different on observable characteristics.

[5] The event year is defined as the year of announcement of an acquisition.

[6] Robustness check was performed including the overlapping acquisitions in the dataset. The estimate on the contemporaneous indicator for acquisition was (0.053) almost one-and-half percentage points higher than our baseline estimates and significant at 1% level. The higher estimated effect of acquisition on CEO pay possibly reflects the

The final sample consists of 953 acquisitions undertaken by 932 firms.1823 sample firms do not engage in any acquisitions over 1993-2011. An acquisition is classified as international if the target firm is not enlisted in an US stock exchange. Using this definition, there are 648 domestic and 284 cross-border acquisitions.

Good and Bad Acquisitions

Acquisitions are evaluated on the basis of the response of the stock market to a successful bid announcement over a 7 day period $[-3, +3]$.[7]. The announcement effect is conventionally used as an indicator for the market reaction to and the impact of an acquisition on the shareholders' wealth. The abnormal returns on the acquiring firm's stocks were computed with respect to the returns on the market index. 38% of the acquisitions in the sample have positive abnormal returns and 62% acquisitions are associated with negative abnormal returns. Following Khoranna and Zenner (1998) and Girma et al. (2006), a bad acquisition is defined as an event for which $CAR[-3, +3]$ around the announcement date is negative. From Table 5, 57.5% (548 out of 953) of sample acquisitions has negative cumulative abnormal returns in the 7-day announcement window.[8]

Governance Variables

Board Size and composition, and CEO power is likely to impact upon the risk-taking behaviour of the CEOs (Pathan, 2008). Board size and composition is used to control for the strength of governance. Board size is measured as the number of directors on the board. Board independence is measured using percentage of outside directors on the board. In addition, the percentage shareholding of the CEO in the firm is likely to be a determinant of CEO power. A higher percentage share ownership of the CEO may also align the interests of the CEO and the shareholders. Either

overlapping effects of closely timed acquisitions.

[7]The robustness of the results was tested using CAR[-1,+1] and CAR[-5,+5] as event windows to classify bad acquisitions. The results are qualitatively similar.

[8]Robustness of the estimates was checked using CAR[-5,+5].

way, it is likely to be impact upon the strength of governance.

3 Methodology

We control for survivor bias the acquisition-premium in CEO pay using a Heckman selection model. It is not immediately obvious what an appropriate exclusion restriction could be as many of the determinants of the probability of retention are also likely to impact upon CEO pay. The identification strategy of this paper is based on the median severance entitlement of CEOs in the event of a turnover caused by change in control within a 2-digit SIC level. The exclusion restriction is the median *ex-ante* change in control pay eligibility of the CEOs in a given 2-digit industry code in the event of an involuntary turnover arising out of change in corporate control (viz. acquisitions). *A priori*, it can be expected that a higher median change in control payment will increase the probability of CEO retention post acquisition by making it more expensive for firms to hire new CEOs. However, the median eligibility of change in control pay in the same industry is unlikely to impact upon an individual CEO's pay. Change in control payment is only relevant when an event of turnover following an acquisition is under consideration and it is likely to impact upon the CEO pay only through its effect on survival probability.

It might be possible that CEOs undertake acquisitions to increase their pay whilst knowing that an event of dismissal will lead to a lump-sum payment. If that is the case then the eligibility of change in control will be contributing to managerial decision making in undertaking acquisitions. Zhao (2013) suggest that a provision of change in control pay do not provide managers with perverse incentives in acquisition decisions. From Table 2, the median severance pay is approximately 38% of the median CEO pay. Thus the one-off pay is unlikely to motivate the CEO to undertake a risky acquisition as she stands to gain more by being in the job and not undertaking an acquisition. The incentive effects of increased pay are likely to dominate any incentive effect of a one-off separation

pay.

It may yet be conceivable that in certain situations, the incentive effects are reversed: a one-off separation pay may provide more utility to the CEO than continued annual pay. This is likely to be the case for CEOs nearing retirement for whom the stream of future income is truncated. The incentives of CEOs nearing retirement are reportedly different due to shorter horizon of decision making (Antia, *et al.* 2010; Dechow and Sloan, 1991; Matta and Beamish, 2008). The analysis of the paper is based on the sub-sample of acquisitions not undertaken within the last two years of a CEO's tenure. Whilst this leads to a 7% loss in the number of acquisitions, this allows us to study the incentive effects of undertaking acquisitions where the CEO's incentive horizon is not truncated by impending retirement. In short, there is no strong reason to suspect that a CEO will undertake a risky acquisition being motivated by the severance pay as the worst outcome.

Ideally, a test for instrument validity is useful to address any concerns about the exogeneity of the instruments. However, there are no readily available tests for the validity of exclusion restrictions in Heckman selection models. From Table 3, there is no significant difference in the eligibility of change in control payments between the acquiring and the non-acquiring firms. To attenuate the concern that CEO pay and industry average of the eligibility of change in control payment might co-vary, Table 4 presents the median CEO pay at different quartiles of the distribution of change in control payment eligibility. There seems to be no evidence of association between the two variables. The only significant difference of median values is for firm size: CEOs of large firms seem to have a higher change in control payment eligibility.

Moreover, regression estimates of the industry average of the change in control pay eligibility on total CEO pay and probability of CEO turnover suggests that change in control pay eligibility is significantly (and negatively) associated with probability of CEO turnover (p value = 0.005) but

has an insignificant effect on CEO pay (p value = 0.244). All the above evidence suggests that the exclusion restriction is associated with the probability of turnover but not CEO pay. In section 4.3, we discuss robustness checks of the exclusion restriction and the estimation technique.

In the first-stage, we estimate the probability of an acquiring CEO retaining her job after the event using covariates for firm-level and CEO-level characteristics and entitlement of change in control payment as the exclusion restriction.

The predicted probability of CEO retention is used to control for the survivor bias in the acquisition-premium in CEO pay with the usual covariates for firm size, firm characteristics and governance. The baseline empirical model specification is as follows:

$$\begin{aligned} LnPay_{it} &= \alpha + \beta_1 FirmP\,\mathrm{erf}\,ormance_{it} + \beta_2 Sales_{it} + \beta_3 X_{it} + \beta_4 Acquisition_{it} \\ &\quad + \beta_5 Acquisition_{it} * Sales_{it} + \beta_6 \sigma + \rho(\mathrm{Re}\widehat{tention}_{it}) + f_i + h_t + \varepsilon_{it} \end{aligned} \tag{1}$$

Where observations of Pay_{it} after an acquisition is conditional on the outcome of the selection equation specified as:

$$\mathrm{Re\,tention}_{it} = \begin{cases} 1 \; if \gamma z_{it} + \nu_{it} > 0 \\ 0 \quad Otherwise \end{cases} \tag{2}$$

z_{it} contains all the observable parameters of firm performance, firm size, CEO tenure, corporate governance measures and industry classifications that contribute to the probability of retention of the CEO in the event of an acquisitions and ν_{it} represents the exclusion restriction.

The coefficient β_1 estimates the effect of firm performance on CEO pay. Return on assets (ROA_{it}) and Market-to-Book Value ($MTBV_{it}$) is used to control for firm performance. Consistent with the existing literature, historical firm performance is associated with post-acquisition pay up to two lag periods and hence we control for two lags of firm performance (Geddes and Vinod, 1997; Girma, Thompson and Wright, 2006).

$Sales_{it}$ is used as the measure of firm size.[9] It is difficult to decompose the sales into "organic sales" and increases in sales due to acquisition, particularly because data cross border targets is often not available. β_4 captures the bias-corrected acquisition effect on CEO pay. If acquisitions are associated with a rise in CEO pay, then the coefficients on the $Acquisition_{it}$ (and its lags) will be significant and positive. $Acquisition_{it}$ is an indicator which equals '1' if an event of acquisition is announced in a given year[10]. The use of lagged indicators for acquisition is expected to yield qualitatively similar results to that obtained from dynamic panel models. β_3 captures the effects of all other observable firm performance measures contained in the vector, X_{it}. The standard deviation of monthly stock returns (σ) over a given year is used to control for the risk in firm's information and operating environment. f_i and h_t control for firm and year fixed effects, respectively. The estimation reports robust standard errors that are clustered at firm level.

It might be argued that the increase in firm size through acquisition provides the CEO with stronger incentives since the pay-size relationship is known to dominate pay-acquisition effect. Therefore, we use an interaction of $Acquisition_{it} * Sales_{it}$ to control for the size effect of acquisition.

Next, we examine whether survivor bias can account for differential pay awards for *ex-post* 'value-enhancing' and 'value-destroying' acquisitions. In equation (3), the baseline specification is augmented with an indicator ($Negative\,\mathrm{Re}\,turn_{it}$) for bad acquisition, which equals '1' for $CAR[-3,+3] < 0$.Further, an interaction of $Negative\,\mathrm{Re}\,turn_{it}$ with $Acquisition_{it}$ is added to the baseline specification. If the reported pay-premium for undertaking bad acquisitions can be accounted for by survivor-bias, the estimate of the $Acquisition_{it} * Negative\,\mathrm{Re}\,turn_{it}$ will be sta-

[9] Qualitatively similar results are obtained using log of Total Assets as measures of firm size.

[10] We do not separately control for multiple acquisitions undertaken in a given year: the indicator for Acquisition equals 1 for any number of events.

tistically insignificant.

$$LnPay_{it} = \alpha + \beta_1 ROA_{it} + \beta_2 \sigma_{\mathrm{Re}\,t_{it}} + \beta_3 Sales_{it} + \beta_4 Acquisition_{it} + \tag{3}$$
$$+ \beta_5 Negative\,\mathrm{Re}\,turn_{it} + \beta_6 (Acquisition_{it} * Negative\,\mathrm{Re}\,turn_{it}) + \beta_7 \sigma$$
$$+ f_i + h_t + \varepsilon_{it}$$

Finally, the mechanism of the acquisition premium in CEO pay may be through increases in bonus payouts (Grinstein and Hribar, 2004). To examine the survivor bias in disaggregated measures of pay, the baseline specification was re-estimated using bonus as the dependent variable. If there is no survivor bias in bonus, it would appear that the post-acquisition pay premium is manifest mostly in bonus payouts.

4 Results And Analysis

4.1 Is there a Survivor Bias in the acquisition premium in CEO pay?

The results are presented in Table 6**.** Column (1) presents the results of the selection equation and column (2) reports the estimates from the outcome equation. Column (3) presents the fixed effects estimates of the impact of acquisitions on CEO pay without correcting for the survivor-bias. The Wald test of independent equations ($\rho = 0$) tests if the Heckman selection model is appropriate for the system of equations. The association parameter (ρ) is positive ($\rho = 0.215$) and statistically significant (robust standard error= 0.0402): any parameter that increases the probability of retention in the event of an acquisition also increases the post-acquisition CEO pay.

From the first-stage estimation, the exclusion restriction is significant and positive, which supports the hypothesis that a higher industry average of change in control payment eligibility lowers the probability of CEO turnover. More importantly, acquiring CEOs seem to have a higher likelihood of turnover. Acquiring CEOs are 35% less likely to be retained compared to their non-

acquiring counterparts. The likelihood of turnover is significant in the year following an acquisition. These suggest that the likelihood of post-acquisition turnover may carry incentive effects for undertaking acquisitions. The size and composition of the board significantly impacts upon the likelihood of retention. Large boards with a lower percentage of outside directors are less likely to dismiss the CEO. A higher percentage share ownership of the CEO is likely to decrease the likelihood of dismissal.

The impact of the predicted probability of dismissal is used in estimating the acquisition premium in CEO pay. Not surprisingly, there is a positive and statistically significant association of probability of retention and pay. However, the focus of this analysis is the impact of acquisition on pay when the probability of retention is controlled for. Undertaking an acquisition leads to a 1.8% increase in CEO pay. The pay premium for acquiring CEOs persists in the year following acquisitions. However, this estimate of the acquisition premium is significantly lower than the fixed effects estimates (∼4 pp.) as presented in column (3). The "pure" acquisition premium in pay is reduced by over 50% when the likelihood of post-acquisition turnover is controlled for. There seems to be a survivor bias in the standard fixed effects estimates of acquisition premium. Given a non-zero risk of dismissal following an acquisition (Lehn and Zhao, 2006), the small pay premium of 1.8% may not be a strong incentive for a risk-neutral CEO to undertake acquisitions. The estimate of $Acquisition_{it} * Sales_{it}$ is positive and significant, suggesting that CEOs do gain in pay for the increase in firm size through acquisition. However, the magnitude of the effect, 0.91 percentage point, is of the same order as the "pure" acquisition premium in pay. hence, we expect them to have similar incentive effects.

The estimates on covariates for firm size, firm performance and board characteristics are consistent with previous literature: CEO pay is higher in larger firms with large and less independent

boards.

Further, it is of interest to understand how the survivor bias impacts upon disaggregated measures of pay. We examine the survivor bias in post-acquisition CEO bonus. The results are presented in Table 7. The estimates of the bias-corrected premium in acquisition bonus are presented in column (2). There is a 2.2% premium in bonus for acquiring CEOs, which persists for the year following acquisitions. There seems to be no premium for undertaking cross-border acquisitions. The fixed effects estimate of the acquisition premium in bonus is 5.1% as presented in column (3). The premium in bonus payouts is reduced by ∼57% when the likelihood of post-acquisition turnover is controlled for. It seems that the survivor bias in the acquisition premium estimates is systematic across different measures of pay awards. All other covariates retain their expected sign and significance.

4.2 Does survivor bias account for the pay premium for bad acquisitions?

Further, to examine how the survivor bias affects post-acquisition pay premium for CEOs undertaking bad acquisitions, the baseline specification is augmented with $Negative\,\mathrm{Re}\,turn_{it}$ and $Acquisition_{it} * Negative\,\mathrm{Re}\,turn_{it}$. The objective is to investigate further if good and bad acquisitions are rewarded equally, providing the CEO with an incentive to engage in value-destroying acquisitions. If there is survivor-bias in the acquisition premium in pay for CEOs engaging in value-destroying acquisitions, then the incentive effects of undertaking risky acquisitions for pay increase are further reduced. The results are presented in Table 8.

The estimate of $Negative\,\mathrm{Re}\,turn_{it}$ is negative and borderline significant at 5% level. The coefficient of the interaction term $Acquisition_{it} * Negative\,\mathrm{Re}\,turn_{it}$ is negative and significant: CEOs undertaking bad acquisitions suffer a contemporaneous pay decrease. These results suggest that risky acquisitions may not result in any pay gain for the CEO and if the likelihood of post-

acquisition dismissal is controlled for, CEOs engaging in acquisitions that do not gain the approval of the market are likely to be penalised. This result is not consistent with the managerial power theory which suggests that CEOs are rewarded for undertaking an acquisition, irrespective of the *ex-post* financial outcome of the event. This suggests an important limitation to the motivations of the CEO in undertaking acquisitions. Under imperfect information about the *ex-post* likelihood of dismissal and possible pay loss, a utility maximizing risk-averse CEO will have little monetary incentives to undertake risky acquisitions. It appears that the likelihood of post-acquisition dismissal acts as a tool of incentive alignment.

Finally, using Cumulative Abnormal Returns (CAR$[-3,+3]$) around the announcement date to categorize 'value-enhancing' and 'value-destroying' acquisitions may be a short term statistic to estimate the wealth effects of an acquisition. The horizon of the performance effect of the acquisition and the unvested equity options of the CEO may extend beyond the announcement effect (Vijh 1997; Rau and Vermaelen, 1998). To control for the long-term impact of acquisitions, the annualised value-weighted returns of a firm is benchmarked to the median firm at 2-digit SIC level. If the benchmarked return in an event year is negative, the event is classified as a bad acquisition. The indicator $NegativeValueWeighted\,\mathrm{Re}turn_{it}$ equals if the annual value weighted return of the acquiring firm is lower than the value weighted return of the median firm in the same 2-digit SIC code. The results presented in Table 9 are qualitatively similar to the baseline estimates. It appears that the results are not driven by the empirical strategy to classify bad acquisitions.

4.3 Robustness Issues

The acquiring firms may not be a randomly selected subsample and the decisions to undertake acquisitions may be endogenous. If the omitted variables that determine whether a firm undertakes an acquisition are correlated with the factors that determine the pay increase, the estimates can po-

tentially be biased. We seek to circumvent this problem in two ways. First, we use firm fixed effects in the model to mitigate potential biases due to time invariant omitted variables. Secondly, the probability of a firm undertaking an acquisition is instrumented using CEO tenure and an indicator for whether the firm has undertaken acquisition(s) in the previous two years. $AcquisitionHistory$ equals '1' if a sample firm has undertaken one or more acquisition in the previous two years and '0' otherwise. We chose these instruments because CEO tenure may affect the entrenchment of the CEO and hence his decision to undertake acquisition. Similarly, prior acquisition history may be a predictor of the likelihood of future acquisition. This instrumentation strategy yields estimates that are qualitatively similar to the fixed effects. For the interests of brevity, the results are not presented.

Second, there might be a concern that the mean severance pay eligibility picks up other industry level variations that might impact pay. We estimate the system of equations (1) and (2) with industry fixed effects rather than firm fixed effects. The results are qualitatively similar to our baseline estimates.

Finally, we checked the robustness of our results using the interaction of the industry average change in control eligibility and firm size. The results are qualitatively similar to the original estimates. The baseline results don't seem to be driven by the choice of exclusion restriction or estimation technique. Finally, the central results are checked for robustness of the nature of financing of the acquisition and industry effects. It appears that the main results are not driven by industry classifications and the type of acquisition financing. The results are omitted in the interests of brevity.

5 Conclusion

This paper examines the survivor bias in the acquisition premium in CEO pay for a large sample of

US firms over the period 1993-2011. Controlling for the likelihood of post-acquisition takeover, we find evidence of survivor bias in the earlier estimates of acquisition premium in CEO pay. Consistent with the extant literature, we find that acquiring CEOs are paid more than their non-acquiring counterparts but the magnitude of the pay premium is reduced by over 50% if the likelihood of post-acquisition CEO turnover is controlled for. If survivor bias is corrected for, there is no premium in pay for CEOs engaging in value-destroying acquisitions, and indeed, they suffer a decline in pay. These results are important to understand the incentives of managers to undertake risky acquisitions.

Given that the likelihood of post-acquisition dismissal is not known to the risk-averse CEO *ex-ante* and that controlling for this likelihood, the premium in pay is quite small, the managerial incentives to undertake risky acquisitions is low. Moreover, controlling for dismissal risk, there is no premium in pay for a CEO who undertakes a value-destroying acquisition. These results are inconsistent with the managerial power hypothesis. If a CEO has little incentive to undertake a risky acquisition to increase pay, an interesting area of future research is to examine whether other perspectives to explain the decision making of managers in undertaking risky acquisitions.

It is worth noting that the results of this paper are in no way suggestive of an efficient principal-agent arrangement. CEOs routinely undertake risky and value-destroying acquisitions. This paper contributes to the literature in suggesting that the incentives for undertaking bad decisions may lie elsewhere and that pay increase may not be a sufficiently strong motivation if the likelihood of dismissal is accounted for. Future research could focus on non-monetary incentives for undertaking acquisitions. Further, this paper contributes to the literature by suggesting that the shareholders are able to exercise some control over managerial incentives to engage in risky acquisitions through the mechanism for dismissal.

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Table 1: Variable Descriptions

Variables	Descriptions	Source
Retention	Indicator for event of CEO is retained following acquisition	Execucomp
Tenure	Length of CEO tenure in a firm (in Years)	Execucomp
CEO Pay	Salary + Bonus + Value of options + LTIP + RSU in '000 US$	Execucomp
Value Weighted Return	Weighted average of all stock returns,weights given by the market value of the stock issue (price * share s outstanding) at the end of the previous trading period.	CRSP
Benchmarked Value Weighted Return	Difference in firm's annual value weighted return to that of the median firm in the2-digit SIC level	Author's Calculation
σ	Standard Deviation of the annual stock prices	Author's Calculation
Acquisition	Event by which a firm increases its voting shares in another firm to 50% or more.	Multiple Sources
Firm Size	Natural log of Sales	Execucomp
Change in Control Payment	Ex-Ante Contracted Severance Pay entitlement of the CEO in events of turnover following acquisitions, '000 US$	Execucomp DEF 14A
Percentage Share Ownership	Percentage of equity holdings of an individual CEO in a firm	Execucomp
Board Size	Number of Directors on a board	RiskMetrics
Board Independence	Percentage of outside Directors on the board	RiskMetrics

Table 2: Summary Statistics of Full Sample and Sample

This table presents the descriptive statistics of key variables for the full sample period The key variables of interest are CEO Pay and Change in control payment eligibility.

	N	Mean	Median	SD	Max	Min
CEO pay ('000 US$)	16621	4306.51	1604.09	10257.00	295136.40	0.01
ROA ('000 US$)	16248	2.56	3.78	42.87	3551.35	-1314.88
Average Value weighted Return	16265	0.0041	0.0111	0.0488	0.1105	-0.1846
Change in Control Payment ('000 US$)	16581	1411.34	614.01	787.56	241089.80	0.00
Sale ('000 US$)	16621	4090.80	902.71	13799.02	42507189.00	0.03
CEO Share Ownership (%)	16544	0.7031	0.00	3.84	88.20	0.00
Board Size	13022	9.48	9.03	2.65	34.00	3.00
Outside Directors (%)	13022	70.40	71.34	16.88	92.30	55.60
No. of Directorships	13022	2.57	3.09	8.58	15.00	0.00

Table 3: Summary Statistics for Acquiring and Non-Acquiring Firms

This table presents the summary statistics for acquiring and non-acquiring firms to address potential endogeneity in undertaking acquisitions. The summary statistics for the Control Group of firms and acquiring firms in periods before acquisitions are qualitatively similar.

	Periods Before Acquisition		Periods After Acquisition		Control Group	
Variables	Mean	Std. Dev	Mean	Std. Dev.	Mean	Std. Dev
ROA_{it}	2.68	19.90	1.98	3.39	2.49	45.32
$MTBV_{it}$	2.61	5.33	2.05	6.11	2.54	5.10
CEO Pay	3640.16	1204.26	5603.91	2123.39	3261.48	977.20
Sales	4540.81	5683.07	7154.82	4929.02	3085.96	3635.43
Change in Control Pay	3210.14	1010.52	3304.56	1255.17	3099.82	2602.15

Table 4: Summary Statistics of Key Variables at different Percentiles of Change in Control Payment Eligibility

This table presents the median values of key variables at different quartiles of eligibility of change in control payment. There seems to be no evidence to suggest that the median CEO pay co-varies with change in control payment. The only significant difference is in median firm size, suggesting that CEOs of larger firms have a higher eligibility of change in control payment.

	Change in Control Payment Eligibility				
Variable	25%	50%	Difference	75%	Difference
Median CEO Pay	1311.62	1400.82	89.2	1513.47	112.65
Median ROA	3.66	3.70	0.4	3.77	0.7
Median MTBV	2.06	2.44	0.38	2.93	0.49
Median Sale	774.13	6899.40	6125.27*	14348.00	7448.6*

Table 5: Distributions of Acquisitions by Year

Year	FullSample	Negative CAR$[-3,+3]$	Positive CAR$[-3,+3]$
	Frequency	Frequency	Frequency
1993	15	08	07
1994	34	14	20
1995	57	36	21
1996	55	31	24
1997	67	37	30
1998	74	44	30
1999	57	35	22
2000	22	10	12
2001	26	18	08
2002	21	14	07
2003	53	33	20
2004	69	34	35
2005	78	42	36
2006	81	49	32
2007	56	31	25
2008	55	33	22
2009	48	28	20
2010	43	21	22
2011	42	30	12
Total	953	548	405

Table 6: Acquisition Premium in CEO Pay: Fixed Effects and Heckman Selection Estimates

In this table we present the estimates of acquisition premium in CEO pay, correcting for survivor bias. In columns (1) and (2) we present the estimates of the Heckman Selection model and in column (3) we report the fixed effects estimates. The dependant variables for each column is mentioned below. *, **, *** indicate significance at 10%, 5%and 1% levels respectively. The p-values are given in the brackets.

	Survivor bias Corrected		Fixed Effects
Parameters	Selection Equation (1)	Heckman Corrected (2)	(3)
Dependent Variable	CEO Retention	Log Pay	Log Pay
ROA_{it}	0.034***	0.012*	0.032*
	(0.000)	(0.059)	(0.068)
ROA_{it-1}	0.027**	0.010	0.018*
	(0.019)	(0.354)	(0.077)
$MTBV_{it}$	0.014*	0.006*	0.008*
	(0.057)	(0.071)	(0.074)
$MTBV_{it-1}$	0.010	0.000	0.001
	(0.244)	(0.218)	(0.227)
σ	-0.008*	0.119**	0.115**
	(0.060)	(0.005)	(0.003)
Firm Size	0.038*	0.373***	0.385***
(Ln Sales)	(0.059)	(0.000)	(0.000)
$Acquisition_{it}$	-0.351***	0.017**	0.039**
	(0.000)	(0.012)	(0.010)
$Acquisition_{it}$*	0.003	0.009*	0.017**
Firm Size	(0.415)	(0.052)	(0.022)
$Acquisition_{it-1}$	-0.022**	0.016**	0.024**
	(0.034)	(0.013)	(0.019)
$Acquisition_{it-2}$	-0.004	0.009**	0.017**
	(0.208)	(0.033)	(0.012)
Change in Control	0.016**		0.004
Pay	(0.010)		(0.340)
Percentage Share	0.014**	0.001**	0.003**
Ownership	(0.023)	(0.017)	(0.011)
Board Size	0.973**	0.111**	0.022***
	(0.014)	(0.018)	(0.000)
Board	-1.132**	-0.047**	-0.035**
Independence	(0.045)	(0.021)	(0.013)
No. of Observations	13022	13022	13022
ρ	0.215		

Table 7: Acquisition Premium in Bonus: Fixed Effects and Heckman Selection estimates

In this table we present the estimates of survivor. bias in the post-acquisition bonus pay. In columns (1) and (2) we present the estimates of the Heckman Selection model and in column (3) we report the fixed effects estimates. The dependant variables for each column is mentioned below. *, **, *** indicate significance at 10%, 5% and 1% levels respectively. The p–values are given in the brackets.

	Survivor bias Corrected		Fixed Effects
Parameters	Selection Equation (1)	Heckman Corrected (2)	(3)
Dependent Variable	CEO Retention	Log Bonus	Log Bonus
ROA_{it}	0.034***	0.019*	0.033*
	(0.000)	(0.067)	(0.055)
ROA_{it-1}	0.027**	0.017	0.014*
	(0.019)	(0.333)	(0.069)
$MTBV_{it}$	0.014*	0.003*	0.002*
	(0.057)	(0.070)	(0.067)
$MTBV_{it-1}$	0.010	0.001	0.000
	(0.244)	(0.261)	(0.255)
σ_{Ret}	-0.008*	0.181**	0.209**
	(0.060)	(0.014)	(0.012)
Firm Size	0.038*	0.395***	0.441***
(Ln Sales)	(0.059)	(0.000)	(0.000)
$Acquisition_{it}$	-0.351***	0.022***	0.051***
	(0.000)	(0.000)	(0.000)
$Acquisition_{it-1}$	-0.022**	0.010**	0.034**
	(0.034)	(0.015)	(0.014)
$Acquisition_{it-2}$	-0.004	0.003	0.010
	(0.208)	(0.212)	(0.177)
$Acquisition_{it}$*	0.006	0.006*	0.024**
Firm Size	(0.279)	(0.059)	(0.015)
Change in Control	0.016**		0.003
Pay	(0.010)		(0.469)
Percentage Share	0.014**	0.004**	0.007**
Ownership	(0.023)	(0.021)	(0.009)
Board Size	0.973**	0.109***	0.018***
	(0.017)	(0.000)	(0.000)
Board	-1.132**	-0.056***	-0.029***
Independence	(0.045)	(0.000)	(0.000)
No. of Observations	13022	13022	13022
ρ	0.240		

Table 8: Acquisition Premium in Pay Conditional on Acquisition Performance

In this table we present the estimates of acquisition premium in CEO pay,correcting for the likelihood of post-acquisition CEO turnover. In columns (1) and (2) we present the estimates of the Heckman Selection model and in column (3) we report the fixed effects estimates. The dependant variables for each column is mentioned below. Here we present the results of the effect of acquisition outcomes on the pay premium using an indicator to classify bad acquisitions.

	Survivor bias Corrected		Fixed Effects
Parameters	Selection Equation (1)	Heckman Corrected (2)	(3)
Dependent Variable	CEO Retention	Log Pay	Log Pay
ROA_{it}	0.030***	0.012*	0.032*
	(0.000)	(0.080)	(0.068)
ROA_{it-1}	0.023*	0.010	0.018*
	(0.092)	(0.354)	(0.077)
$MTBV_{it}$	0.012*	0.009*	0.008*
	(0.011)	(0.072)	(0.070)
$MTBV_{it-1}$	0.003	0.000	0.000
	(0.239)	(0.222)	(0.220)
σ_{Ret}	-0.008*	0.119**	0.115**
	(0.060)	(0.011)	(0.013)
Firm Size	0.038*	0.373***	0.385***
(Ln Sales)	(0.059)	(0.000)	(0.000)
$Acquisition_{it}$	-0.351***	0.018**	0.039**
	(0.000)	(0.021)	(0.011)
$Acquisition_{it-1}$	-0.022**	0.016**	0.024**
	(0.034)	(0.026)	(0.019)
$Acquisition_{it-2}$	-0.001	0.003	0.009
	(0.210)	(0.224)	(0.215)
Negative $Return_{it}$	-0.071*	0.003	0.011
	(0.064)	(0.320)	(0.229)
$Acquisition_{it}$*	-0.055**	-0.021**	-0.006
Negative $Return_{it}$	(0.019)	(0.014)	(0.294)
$CrossBorder_{it}$	-0.015*	0.016	0.017*
	(0.077)	(0.205)	(0.090)
Change in Control	0.016**		0.004
Pay	(0.010)		(0.343)
Percentage Share	0.014**	0.001**	0.003**
Ownership	(0.023)	(0.017)	(0.011)
Board Size	0.973**	0.111**	0.022***
	(0.017)	(0.025)	(0.000)
Board	-1.132**	-0.047**	-0.035**
Independence	(0.045)	(0.014)	(0.013)
No. of Observations	13022	13022	13022
ρ	0.215		

Table 9: Bias Corrected Acquisition Premium in Pay Conditional on Long Run Acquisition Performance

In this table we present the estimates of acquisition premium in CEO pay,correcting for the likelihood of post-acquisition CEO turnover. In columns (1) and (2) we present the estimates of the Heckman Selection model and in column (3) we report the fixed effects estimates. The dependant variables for each column is mentioned below. Here we present the results of the effect of acquisition outcomes on the pay premium using a long term metric to classify bad acquisitions.

	Survivor bias Corrected		Fixed Effects
Parameters	Selection Equation (1)	Heckman Corrected (2)	(3)
Dependent Variable	CEO Retention	Log Pay	Log Pay
ROA_{it}	0.022**	0.019*	0.032*
	(0.011)	(0.073)	(0.068)
ROA_{it-1}	0.017	0.015	0.018*
	(0.124)	(0.286)	(0.077)
$MTBV_{it}$	0.012*	0.007*	0.008*
	(0.026)	(0.058)	(0.070)
$MTBV_{it-1}$	0.001	0.001	0.000
	(0.263)	(0.205)	(0.220)
σ_{Ret}	-0.013**	0.141**	0.115**
	(0.045)	(0.017)	(0.013)
Firm Size	0.044	0.363***	0.385***
(Ln Sales)	(0.115)	(0.000)	(0.000)
$Acquisition_{it}$	-0.329**	0.016**	0.039**
	(0.010)	(0.013)	(0.011)
$Acquisition_{it-1}$	-0.085**	0.012**	0.024**
	(0.043)	(0.022)	(0.019)
$Acquisition_{it-2}$	-0.004	0.005	0.009
	(0.254)	(0.239)	(0.215)
Negative Benchmarked	-0.055*	0.006	0.011
$Return_{it}$	(0.070)	(0.281)	(0.229)
$Acquisition_{it}$* Negative	-0.039**	-0.031**	-0.006
Benchmarked $Return_{it}$	(0.011)	(0.017)	(0.294)
Change in Control	0.014**		0.004
Pay	(0.015)		(0.343)
Percentage Share	0.024**	0.004**	0.003**
Ownership	(0.018)	(0.012)	(0.011)
Board Size	0.953**	0.137**	0.022***
	(0.031)	(0.020)	(0.000)
Board	-1.117**	-0.058**	-0.035**
Independence	(0.038)	(0.013)	(0.013)
No. of Observations	13022	13022	13022
ρ	0.227		