



Agency problems in stock market-driven acquisitions

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Abstract

Purpose – The purpose of this paper is to examine the ways in which stock market valuation and managerial incentives jointly affect merger and acquisition (M&A) decisions and post-M&A performance, and to provide new evidence on the agency implications where such acquisitions are driven by the stock market.

Design/methodology/approach – Utilizing all publicly-traded US firms in the NYSE, AMEX and NASDAQ during the period from 1992 to 2005 (excluding financial and utility firms), obtained from COMPUSTAT, CRSP, I/B/E/S, and the M&A database provided by SDC Platinum, this paper adopts a two-stage approach: the first stage, predicts the probability of an M&A based on the market valuation variables; the second stage, regresses the post-M&A firm performance on the predicted probability of a merger or acquisition from the first stage and other control variables.

Findings – Market valuation has a significant influence on corporate acquisition decisions, particularly for those firms whose compensation packages include less managerial equity ownership, more executive stock options and no long-term incentive plans, and in those firms where CEOs are serving on the board of directors. The value-destroying acquisitions made by these types of managers are likely to be financed using the firms' stocks, executed with high premiums and undertaken during periods of high market valuation.

Originality/value – The main finding suggests that market-driven acquisitions could be value destroying when managers engage in opportunistic acquisitions for reasons of self-interest. Managerial myopia, overconfidence, misaligned incentives, empire-building motives and poor corporate governance can all exacerbate the agency problem of market-driven acquisitions.

Keywords Acquisitions and mergers, Market value, Compensation, United States of America

Paper type Research paper

1. Introduction

Issues relating to the motivation for, and the subsequent consequences of, mergers have been at the heart of research into mergers and acquisitions (M&As) for many years. The

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general nature of the research up to the 1990s was very much firm-specific, with Nelson (1959) being amongst the first to examine the time-series pattern of aggregate merger activities, and to propose both clustering and inter-industry variations in such activities. Since then, numerous empirical studies have confirmed the nexus between merger waves and stock market prices. For example, Holmstrom and Kaplan (2001) argue that, as opposed to being merely a passive reflection of firm value, stock prices actually play very active roles in affecting corporate M&A decisions.

By exploring the nexus between the stock market, corporate acquisitions and managerial incentives, this study adds to the recent literature on the causes and consequences of market-driven acquisitions. Our study is motivated by the reality of M&As, in terms of the ongoing debate about their true nature. Over the past few decades, the M&A activity rate seems to have coincided with changes in stock market conditions; thus, there is little doubt that the stock market plays an important, influential role in the growth in M&A activities.

Issues that remain unclear, however, are the value consequences of market-driven acquisitions and the true motives behind such acquisitions; these are issues of particular importance when significant shareholder ownership value is at stake. It is, however, quite clear that the performance of acquiring firms is not improved by acquisition activities; indeed, they can destroy shareholder value. An example is provided by one of the largest of all recent mergers, AOL-Time Warner in 2000, which has been widely criticized for its ultimate failure to create shareholder value. *The New York Times* (Gretchen Morgenson, 5 June 2005) reported the following:

To most investors, mergers are the stock market's equivalent of catnip . . . and yet, for all the profit and promise that mergers seem to hold, the truth about companies combining their operations is a darker one. Academic research suggests that few mergers add up to significantly more prosperous or successful companies and also that acquisitions during buyout booms, like the one we are in now, are more likely to fail than those made in other periods. And when one company acquires another using its own stock as currency, as commonly happens today, shareholders' stakes in the acquiring firm typically decline. What's worse, there is a disturbing trend among some of the most aggressive corporate acquirers to use deals to mask deteriorating financial results at their companies and to reap outside executive pay.

The research direction and motivation for this study lie in the investigation of the reasons why acquisitions can be value destroying, particularly when stock market valuation is high and corporate executives have more dubious motives for pursuing their acquisition decisions. We therefore explore corporate governance and the financial contracting implications of corporate investment driven by asset bubbles. Although the stock market is not seen as a sideshow for corporate investment decisions (Morck *et al.*, 1990), market-driven investment and acquisition decisions could result in a new type of agency problem, one that is driven by managerial hubris, empire-building and inefficient incentive compensation.

We go on to explicitly account for:

- the agency and behavioral aspects of stock market-driven acquisitions;
- the effects of stock market valuation on the quality of corporate acquisitions categorized by acquisition types and managerial characteristics; and
- the value implications for different sample groups of market-driven acquisitions.

We also propose the existence of a correlation between the acquisition types (such as mergers with stocks as the exchange medium, mergers with high bid premiums, mergers during periods of high market valuation, and mergers resulting in an increase in firm size) and managerial/agency characteristics (such as managerial myopia, overconfidence/hubris and empire-building).

The value implications provide important guidance on whether acquisitions are value maximizing, as suggested by the neoclassical theory (Jovanovic and Rousseau, 2002), or whether they may be driven by inefficient self-serving managerial incentives, as proposed by behavioral theory (Jensen, 2005). Our findings also contribute to the literature on agency theories in general (Jensen, 2005) and on managerial myopia in particular (Stein, 1989; Garvey *et al.*, 1999).

Being amongst the first to examine the ways in which stock market valuation and managerial incentives can jointly affect M&A decisions and post-M&A performance, this study contributes to the existing literature by providing new empirical evidence on the causes and consequences of stock market-driven M&As under different managerial characteristics. We highlight the role of CEOs in M&A activities, and the interaction effect between stock market influences and managerial incentives, neither of which has yet been well documented within the extant literature. This interaction is regarded as being of particular importance, because managers as decision makers affect corporate behavior and performance (Bertrand and Schoar, 2003; Adams *et al.*, 2005; Dow and Raposo, 2005), with heterogeneity in crucial decisions, such as acquisitions, being potentially explained by diverse managerial incentives.

Consistent with Shleifer and Vishny (2003), who argue that the stock market plays an influential role in M&A decisions, we find that market valuation has a significant impact on the likelihood of M&As, the exchange medium selected and the level of the bid premiums. Firms with less managerial equity ownership, more executive stock options and no long-term incentive plans, and where CEOs serve as board directors, are more likely to engage in value-destroying, market-driven M&As.

The extant literature offers various perspectives on market-driven acquisitions based upon a variety of theoretical rationales. Consistent with the neoclassical perspective, Jovanovic and Rousseau (2002) demonstrate that mergers may have greater value in periods of high market valuation, given the efficiency of the stock market in reallocating capital to the highest-value users. Whilst offering explanations of the stylized facts on M&As, other theories also argue that stock market inefficiency provides opportunistic timing for merger activities.

Shleifer and Vishny (2003) propose a market-driven acquisition model in which rational managers use overpriced shares as cheap currency to make acquisitions with no synergy. Acquisitions in their model are a form of arbitrage by rational managers, driven purely by irrational stock market mispricing. Rhodes-Kropf and Viswanathan (2004) argue that merger waves occur during valuation waves because (ex-post) targets tend to mistakenly overestimate synergy. Lambrecht (2004) analyzes the timing of mergers motivated by economic shocks, demonstrating that firms have clear incentives to merge in periods of economic expansion. Morellec and Zhdanov (2005) incorporate competition and imperfect information to determine the terms and timing of mergers, solving option exercise games between bidders and targets.

The idea that an inefficient stock market is one of the important drivers of M&A activities is generally supported by much of the extant empirical evidence[1]. Ang and

Cheng (2006), for example, find that when their stocks are overvalued, bidders prefer stock to cash to finance their mergers. Dong *et al.* (2006) also note that for stock-financed mergers, bidders are generally higher valued than their targets, and that the merger wave amongst US firms in the 1990s was mainly driven by market overvaluation. Rhodes-Kropf *et al.* (2005) find that market mispricing affects merger activities, and that high firm-specific errors motivate acquiring firms to use stocks for their acquisitions, resulting in an increase in stock merger intensity with short-run deviations in valuation from the long-run trends.

Lamont and Stein (2006) find that corporate equity issuance and merger activity are substantially more sensitive to aggregate stock prices than firm-level prices, although their findings do not fall in line with the neoclassical model, but instead, a market-timing model based on market inefficiency. Of equal importance, is that managerial incentives and corporate governance both play important roles in providing an understanding of the motives for, and consequences of, M&As (Roll, 1986; Shleifer and Vishny, 1988; Aktas *et al.*, 2005)[2].

Morck *et al.* (1990) present a theory based upon managerial self-interest in firms of larger size and cases of diversification. Fluck and Lynch (1999) view M&As as a form of technology which allows firms to finance marginally- profitable, possibly short-horizon projects which investors would otherwise reject as stand-alone projects due to agency problems. Malmendier and Tate (2008) provide a model of managerial overconfidence where managers over-estimate their ability to generate value from mergers[3]. The empirical evidence provided by Jensen (1986), Stulz (1990) and Shleifer and Vishny (1989) suggests that managers benefit from value-destroying diversification because of agency costs, such as empire-building and managerial entrenchment. Moeller *et al.* (2004) argue that managerial hubris leads to lower abnormal returns for acquirers of the stocks of firms with higher dispersion and larger changes in firm valuation (analyst forecasts), as well as for firms with higher idiosyncratic volatility.

Jensen (2005) argues that managers who defend overvaluation (satisfying growth expectations by the market) will invariably use overvalued equity to make value-destroying acquisitions[4]. Moeller *et al.* (2006) also note that higher valuation increases discretion, raising the possibility that managers will make poor acquisitions once they have run out of good ones. Masulis *et al.* (2007) demonstrate that poor corporate governance encourages managers to engage in empire-building acquisitions, despite such acquisitions being subject to more negative announcement returns.

We conduct our empirical analysis on a sample of US firms traded in the NYSE, AMEX and NASDAQ during the years 1990 to 2006, examining the effects of stock market valuation on acquisition decisions after controlling for corporate financing decisions and fundamental corporate characteristics. We then categorize acquisitions into different groups to investigate whether there are changes in the sensitivity to market valuation for different types of acquisitions (the exchange medium and the bid premium) and managerial incentives (CEO tenure and compensation, and CEOs as board directors). We adopt a two-stage panel regression model to study the value implications of endogenous market-driven acquisitions, comprehensively examining the impact of such endogenous market-driven acquisitions on the future performance of acquirers for different types of acquisitions and managerial incentives. We present several main sets of findings on stock market-driven acquisitions, as follows.

First, M&As respond positively to changes in stock market valuation, with the effect of market valuation on M&As varying across different M&A types and managerial characteristics. We find that high market valuation has a greater and more positive impact on both the likelihood of stock M&As and the level of the bid premiums. The M&A decisions of firms with less managerial equity ownership, more executive stock options and no long-term incentive plans, and where CEOs are serving as board directors, are more responsive to stock market valuation.

Second, by assessing the value implications of market-driven M&As, we examine whether the stock market guides better M&A decisions (as argued by Shleifer and Vishny, 2003) or whether the market actually creates agency problems where managers pursue M&As to justify high market valuation, regardless of any sustainable value creation (as argued by Jensen, 2005). We find that market-driven M&As have significantly negative impacts on future operating and stock performance, suggesting that market-driven M&As could be value destroying for firms within which CEOs are subject to misaligned incentives. We therefore provide new evidence on the agency problem of corporate acquisitions (Jensen, 2005), as documented by Mann and Sicherman (1991), Durnev *et al.* (2004), Moeller *et al.* (2005).

Third, as opposed to examining the change in CEO compensation schemes following M&As (as in Harford and Li, 2007), we examine the effects of CEO incentives on market-driven M&A decisions (including the exchange medium and the extent of overpayment to the targets) and on the resultant post-M&A performance. The impacts on firm performance will vary with the characteristics of managers and board directors for different types of market-driven M&As. Whilst the overall impact of market-driven M&As financed by stocks is significantly negative, such value-destroying impact is greater for those firms whose CEOs have less tenure (experience), lower managerial equity ownership, more executive stock options or no long-term incentive plans, and where CEOs serve as board directors. Similar results are obtained for M&As with high bid premiums, indicating that managerial overconfidence (*hubris*) leads to value-destroying M&A decisions, with misaligned incentives serving to exacerbate the agency problems. In contrast, we find no value-destroying tendency amongst market-driven M&As financed by cash.

Fourth, we investigate the value implications of M&As during periods of high *vis-à-vis* low market valuation. Where high market valuation presents incentives for managers to make inefficient M&A decisions based upon overvalued stocks, market-driven M&As are found to be most value destroying during such high valuation periods. Both the positive effect of stock market valuation on the likelihood of M&As and the negative effect of market-driven M&As on firm performance are greater during periods of high market valuation. Such negative value implications are greater for firms whose CEOs have less tenure, lower managerial equity stake, higher options compensation or no long-term incentive plans, and where they serve as board directors. On the other hand, stock market-driven M&As do not necessarily reduce firm value during periods of low market valuation, when they have significantly positive impacts on firm performance, particularly for firms with low options compensation.

Fifth, market-driven M&As may also arise from the agency problem of empire building. We examine the impact on firm performance with regard to M&A decisions arising from changes in total assets. Such changes have significantly negative impacts on the performance of acquiring firms where CEOs have higher options compensation.

In contrast, the same impact is significantly positive for firms with better corporate governance (i.e. where CEOs do not serve as board directors).

Our findings provide general support for the agency theory of Jensen (2005) by identifying the characteristics of managers prone to making value-destroying decisions. During periods of high market valuation, such sub-optimal deals are likely to be financed by stocks at high bid premiums. We also shed light on the optimal design of managerial compensation packages, based upon pay and performance relationships[5]. We find that the prevalence of stock option grants and the lack of long-term incentive plans could exacerbate the impact of value-destroying acquisitions.

Our results are consistent with the findings of Lewellen *et al.* (1985) – in which it is noted that the negative impacts on stock returns are most pronounced for acquiring firms whose managers have small equity stakes – and those of Ross (2004) Dittmann and Ernst (2007) and Harford and Li (2007) – which question the effectiveness of executive stock options as optimal managerial incentives.

Finally, our findings provide new insights into the role played by boards in terms of monitoring takeover activities and aligning the interests of directors and shareholders (Byrd and Hickman, 1992; Cotter *et al.*, 1997; Harford, 2003). We find that where CEOs serve as board directors (with less effective outside monitoring) most can increase their power (Bebchuk and Fried, 2003), whilst increases in the number of board meetings lead to further stock market-driven acquisition problems.

The remainder of this paper is organized as follows. Section 2 presents the testable hypotheses, followed in section 3 by a description of the data and the empirical methodology. The empirical findings on the agency costs of stock market- driven acquisitions are presented in section 4, with section 5 providing the conclusions drawn from this study.

2. Market-driven mergers and acquisition

2.1 *The major hypotheses*

We develop testable hypotheses in this section based on the rationale behind, and the value implications of, stock market-driven acquisitions. There can be little doubt that corporate decisions are influenced by the gyrations of stock market valuation. When stock prices are overvalued, managers find it more attractive to issue equity; conversely, when stock prices are undervalued, managers will refrain from investing because it would require the issuance of outside equity at too low a price. Stein (1996) and Loughran and Vijh (1997) show that managers will tend to issue overvalued stocks or buy undervalued equity. We outline four testable hypotheses to add to the understanding of the motives behind, and consequences of, market-driven M&As.

H1. Firms are more likely to make stock-financed acquisitions when stock market valuation is high (the financing hypothesis).

The major implication of the financing effect is that stock markets affect firms' M&A activities through their issuance of new securities (Baker *et al.*, 2003; Polk and Sapienza, 2009). A higher market valuation reduces the cost of capital for firms that are heavily reliant upon external capital to finance their investment. Such firms can issue highly-valued equity to fund M&A projects that would otherwise be rejected.

However, if such high market valuation is not consistent with firm fundamental value, managers may take advantage of market inefficiencies for their own short-term

interests. Fischer and Merton (1984) and Stein (1996) find that corporate investment responds to non-fundamental changes in stock prices. Managers may therefore make value-destroying acquisitions with overvalued equity to expand their sphere of control (empire building) or to boost short-term stock prices (catering to the market).

H2. Self-interested managers make sub-optimal acquisition decisions to satisfy their short-term interests (the agency hypothesis).

If managers are myopic, demonstrating a tendency to focus on stock prices over very short horizons, the impact of market valuation on acquisition activity would still be significant even after controlling for important firm fundamental variables and financing decisions. On the other hand, managers may over-estimate their ability to generate value from M&As (Stein, 1996; Malmendier and Tate, 2008).

Supporting evidence is also provided with regard to managerial overconfidence and hubris in M&A activities (Malmendier and Tate, 2008; Aktas *et al.*, 2005). Managers are more likely to place a higher priority on maintaining or boosting their short-term market valuation when their compensation packages are more sensitive to short-term stock prices (Harford and Li, 2007). Conversely, where there is more effective corporate governance and outside monitoring, managers are less likely to make M&A decisions in their own interest (Masulis *et al.*, 2007).

During periods of high market valuation, managers prefer to use stocks as the means of payment for agency-related M&As (Shleifer and Vishny, 2003; Rhodes-Kropf *et al.*, 2005; Ang and Cheng, 2006; Dong *et al.*, 2006), since they will be more willing to pay greater premiums for overvalued target stocks during such periods (Malmendier and Tate, 2008; Fu and Lin, 2008). However, such high market valuation exacerbates the agency problem of managerial myopia, and hence, increases the sensitivity of M&A decisions to market valuation.

H3. Managers with misaligned incentives, or those subject to less monitoring/governance, are more likely to make sub-optimal acquisition decisions.

H4. Myopic managers will tend to make agency-related market-driven acquisitions of firms with stocks at higher bid premiums during high valuation periods; that is, market-driven acquisitions are more value destroying when: the payment method is stocks; the bid premium is high; and they occur in high valuation periods.

Faced with stock market overvaluation, long-horizon managers prefer to make their acquisitions with cheaper capital to increase their long-term firm value, whereas short-horizon managers will tend to take the opportunity for private benefits, either to boost the short-run stock prices or extend the boundary of the firm far beyond its optimal scope. If managers focus on short horizons and make acquisition decisions for their own interest, they may cater to the stock market in the short run, by accepting an investment project with negative NPV, although this will lead to long-term destruction of firm value (Moeller *et al.*, 2005). These agency problems, of catering to the market and empire building, are more severe during periods of high market valuation when managers tend to use stocks with high bid premiums for such acquisitions (Fu and Lin, 2008)[6].

3. Empirical design and data

We examine the impact on corporate acquisition decisions stemming from market valuation, as well as the agency implications behind such market-driven acquisitions. Several studies note that managers derive private benefits from the retention of control and reallocation of resources during acquisitions[7]; we further investigate the post-M&A consequences of these market-driven acquisitions and study the ways in which M&A types and managerial characteristics can jointly affect acquirer performance.

3.1 Empirical framework and key variables

To facilitate our examination of the ways in which stock market valuation affects corporate M&A decisions, we estimate such decisions using a discrete choice model with the following logit model regression:

$$\text{Prob}(\text{M\&A}_{it}) = \alpha + \beta \text{Valuation}_{it-1} + \gamma \text{Control}_{it-1} + \varepsilon_{it} \quad (1)$$

where Valuation_{it-1} includes three measures of market valuation:

- (1) Tobin's Q , computed as the market value of equity plus the book value of assets minus the book value of equity, scaled by book assets;
- (2) momentum returns, measured as the buy-and-hold returns relative to the value-weighted market index returns over the previous twelve-month period; and
- (3) the market sentiment index, constructed and estimated in accordance with Equation (3) in Baker and Wurgler (2002).

Stock market valuation conveys information on changes in the future state of the economy and the idiosyncratic prospects of firms; Tobin's Q reflects information on fundamentals and the overvaluation by the market based upon such fundamentals. This explanation is consistent with the empirical findings of Stein (1996) and Baker and Wurgler (2002), that firms will typically increase their external financing during periods of asset price inflation.

Stock market valuation plays a key role in Q -type models of investment determination. Whilst a high Q ratio may signal good growth prospects, it can also arise from the over-optimism of the market with regard to firm fundamentals (Fischer and Merton, 1984; Stein, 1996). However, despite various attempts to distinguish the Q theory of investment from the mispricing hypothesis, the empirical results are far from conclusive (Morck *et al.*, 1990). This paper provides evidence on the value implications of Q -driven M&A decisions in an attempt to deal with this issue.

The momentum returns and the investor sentiment index both reflect stock market opinions that may actually have nothing to do with firm fundamentals. As in Carhart (1997), we define the momentum returns as the stock returns over the previous twelve-month period, capturing market valuation on firm-level information that is not necessarily related to fundamentals. It has been demonstrated in the prior studies that previous stock returns cannot be explained solely by changes in fundamentals, and that stock prices respond not only to news but also to the irrational over-optimism of noise traders[8].

Tobin's Q and the momentum returns provide a stock market assessment on one particular firm; however, the market sentiment index represents market-wide investor

sentiment. Although stock price signals convey aggregate investment opportunities, they can also create bad incentives to pool firms with bad projects. Lamont and Stein (2006) find that corporate equity issuance and mergers are substantially more sensitive to aggregate stock prices than firm-level prices, whilst Morck *et al.* (1990) find that if the stock market overreacts to fundamentals in a uniform fashion, across all firms at all times, the explanatory power of relative stock returns for investment is particularly low. Failure to control for the impact of market-wide sentiment on investment may result in underestimation of the scope for market valuation to influence investment. As such, the market sentiment index serves as a good proxy for market-wide sentiment, which could be orthogonal to firm fundamentals.

Control_{*it-1*} includes two sets of independent variables:

- (1) financing decisions; and
- (2) firm characteristics.

The financing decisions include two variables, new equity issues, calculated as prices multiplied by the change in shares outstanding scaled by start-of-year market capitalization, and new debt issues, defined as the percentage change in long-term debt.

Firm characteristics comprise five independent variables:

- (1) the log of cash flows;
- (2) the payout ratio (defined as dividend-to-earnings);
- (3) Beta/market risk (estimated using OLS, from a standard CAPM model on value-weighted market returns over a rolling five-year period);
- (4) firm-specific risk (estimated from CAPM residual variance); and
- (5) firm age.

We estimate the treatment-effect model to study the value implications of stock market-driven M&As (with the probability of M&As as the covariate). In the first stage, the probability of an M&A (endogenous binary treatment) is predicted by the market valuation variables (Valuation_{*it-1*}). In the second stage, post-M&A firm performance (R_{t+1}) is regressed on the predicted probability (endogenous binary treatment) of a merger or acquisition from the first stage and other control variables (Control_{*it-1*})[9]:

$$\text{Prob}(M\&A_{it}) = \alpha + \beta \text{Valuation}_{it-1} + \varepsilon_{it} \quad (2)$$

$$R_{it+1} = a + b\hat{\text{Prob}}(M\&A_{it}) + \theta \text{Control}_{it-1} + \varepsilon_{it} \quad (3)$$

We use two different measures of post-M&A performance as dependent variables (R_{it+1}):

- (1) one-year ahead percentage change in earnings as the measure of operating performance; and
- (2) one-year ahead cumulative abnormal returns (CARs) as the measure of stock performance[10].

We further examine variations in the value implications with regard to managerial characteristics, using variables to measure managerial incentives similar to those used in many of the prior studies[11], as follows:

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- CEO tenure, measured as the log of the number of years since the individual became the CEO of the firm;
 - CEO equity ownership stake, as a percentage of the total equity of the firm;
 - CEO options compensation, scaled by CEO total compensation;
 - the value of exercisable in-the-money options for CEOs, scaled by the earnings of the firm;
 - CEO long-term incentive plan, which is the amount paid to the executive under the company's long-term incentive plan;
 - CEO serving as a board director during the fiscal year in question; and
 - the number of board meetings held during the fiscal year in question.

The total compensation for a CEO comprises salary, bonuses and other annual payments, the total value of restricted stock and stock options granted (using Black-Scholes methodology) and long-term incentive compensation. The value of a CEO's exercisable in-the-money options represents the value that CEOs would have realized at year end if they had exercised all of their vested options with an exercise price below the market price[12]. The value of exercisable in-the-money options and total options compensation are used to measure linear and non-linear sensitivity of CEO compensation to stock market valuation.

CEO equity ownership helps to identify the level of conflicting interest, whilst a CEO serving as a board director measures the ability of the CEO to influence the board (Bebchuk and Fried, 2003). Finally, the frequency of board meetings could indicate board intervention in the operational decision making of CEOs, thereby measuring either corporate governance or conflict between managers and board directors.

3.2 Sample and summary statistics

Our sample for empirical analysis includes all publicly-traded US firms in the NYSE, AMEX and NASDAQ during the period from 1992 to 2005 (excluding financial and utility firms), obtained from COMPUSTAT, CRSP and I/B/E/S. Acquiring firms are identified from the M&A database provided by SDC Platinum. Since this study focuses on the value implications of stock market-driven M&As, we consider only completed M&As, excluding rumors of M&A deals and those that are unsuccessful.

To further examine the ways in which managerial (CEO) characteristics affect the nature and consequences of stock market-driven M&As, we compile a sample of executive compensation data from the ExecuComp Database. The ExecuComp Database covers S&P 1,500 firms, and provides a comprehensive coverage of firms with a range of sizes that have made mergers and acquisitions; thus, the sub-sample size used for the analysis of agency problems is based upon 402 firms with no missing values for the key variables, which provides a total of 2,922 firm-year observations[13]. Of these, 594 firm-year observations involve M&As. The descriptive statistics of the key variables used in this study (Table I) are compared between firms with and without M&As.

In Table I, Panel A presents the summary statistics of the stock market valuation measures (Valuation_{it-1}), and fundamental firm characteristics (Control_{it-1}) for all firms, M&A firms, and non-M&A firms. The average market valuation measures are Tobin's Q (2.1156), momentum returns (0.0584) and market sentiment index (0.5002). The mean of these measures are slightly higher since our sample covers the period from 1992 to

Table I.
Descriptive statistics of
M&A and non-M&A
firms

	Mean	Median	Standard deviation	Minimum	Maximum
<i>Panel A. Stock market valuation and fundamental firm characteristics</i>					
<i>All firms</i>					
<i>Stock market valuations</i>					
(i) Tobin's Q	2.1156	1.6365	1.5735	0.5824	13.5746
(ii) Momentum returns	0.0584	0.0014	0.4294	-0.8700	1.9707
(iii) Market Sentiment Index	0.5002	0.6700	0.6660	-0.33	1.9900
<i>Fundamental firm characteristics</i>					
(i) New share issues	0.2165	0.0064	1.9557	-6.7604	36.6060
(ii) Growth in debt issues	0.5313	-0.0042	3.1513	-1.0000	26.5633
(iii) log(cash flows)	4.9387	4.8534	1.5241	-2.2256	8.0825
(iv) Dividend (payout ratio)	0.2027	0.0885	0.3740	-0.6386	2.2629
(v) Beta	0.9099	0.8391	0.5382	0.0000	2.9743
(vi) Residual (firm-specific) variance	0.1033	0.0983	0.0347	0.0472	0.2396
(vii) log(firm age)	2.9359	3.0910	0.6364	0.0000	3.6375
<i>M&A firms</i>					
<i>Stock market valuations</i>					
(i) Tobin's Q	2.3829	1.8094	1.9361	0.7474	13.5746
(ii) Momentum returns	0.1034	0.0377	0.4149	-0.8522	1.9707
(iii) Market Sentiment Index	0.5282	0.6700	0.6626	-0.3300	1.9900
<i>Fundamental firm characteristics</i>					
(i) New share issues	0.3312	0.0147	2.6092	-6.7604	36.6060
(ii) Growth in debt issues	4.2688	0.0760	4.2609	-1.0000	26.5633
(iii) log(cash flows)	5.4390	5.3489	1.5296	0.3162	8.0825
(iv) Dividend (payout ratio)	0.1719	0.0680	0.2829	-0.6386	2.2629
(v) Beta	0.9447	0.8617	0.5217	0.0000	2.9743
(vi) Residual (firm-specific) variance	0.0988	0.0952	0.0327	0.0472	0.2269
(vii) log(firm age)	2.9128	3.0445	0.6311	0.0000	3.6375
<i>Non-M&A firms</i>					
<i>Stock market valuations</i>					
(i) Tobin's Q	2.0465***	1.5947	1.4577	0.5824	13.5746
(ii) Momentum Returns	0.0465***	-0.0134	0.4325	-0.8700	1.9707
(iii) Market Sentiment Index	0.4930***	0.6700	0.6668	-0.3300	1.9900

(continued)

	Mean	Median	Standard deviation	Minimum	Maximum
<i>Fundamental firm characteristics</i>					
(i) New share issues	0.1857 ***	0.0052	1.7468	-4.7223	36.6060
(ii) Growth in debt issues	0.3882 ***	-0.0114	2.7632	-1.0000	26.5633
(iii) log(cash flows)	4.8020 ***	4.7561	1.4941	-2.2256	8.0825
(iv) Dividend (payout ratio)	0.2106 ***	0.0953	0.3939	-0.6386	2.2629
(v) Beta	0.9009 ***	0.8351	0.5421	0.0000	2.9743
(vi) Residual (firm-specific) variance	0.1045 ***	0.0988	0.0351	0.0472	0.2396
(vii) log(firm age)	2.9419 ***	3.0910	0.6378	0.0000	3.6375
<i>Panel B. CEO compensation, board of directors and acquisition decisions</i>					
<i>All firms</i>					
<i>CEO and Board of Directors characteristics</i>					
(i) log(CEO's tenure)	1.9318	2.0794	0.9290	0.0000	3.8501
(ii) CEO Equity (% of total shares)	0.0634	0.0170	0.1000	0.0001	0.5203
(iii) CEO's In-the-Money Exercisable Options (% of earnings)	0.0425	0.0164	0.0558	0.0000	0.1694
(vi) Number of Board of Directors Meetings	6.4373	6.0000	2.5067	1.0000	23.0000
(v) CEO Total Option Grants (% of Total Compensation)	0.3381	0.3091	0.2821	0.0000	1.0000
<i>M&A firms</i>					
<i>CEO and Board of Directors characteristics</i>					
(i) log(CEO's tenure)	1.8898	1.9459	0.9094	0	3.7612
(ii) CEO Equity (% of total shares)	0.0487	0.0153	0.0797	0.0001	0.5027
(iii) CEO's In-the-Money Exercisable Options (% of earnings)	0.0494	0.0223	0.0600	0	0.1694
(vi) Number of Board of Directors Meetings	7.0103	7	2.6192	1	20
(v) CEO Total Option Grants (% of Total Compensation)	0.4036	0.3803	0.3063	0	1

(continued)

Table I.

	Mean	Median	Standard deviation	Minimum	Maximum
<i>Non-M&A firms</i>					
<i>CEO and Board of Directors characteristics</i>					
(i) log(CEO's tenure)	1.9424	2.0794	0.9339	0.0000	3.8501
(ii) CEO Equity (% of total shares)	6.6695 ***	1.8000	10.3705	0.0072	52.0300
(iii) CEO's In-the-Money Exercisable Options (% of earnings)	0.0408 ***	0.0149	0.0545	0.0000	0.1694
(iv) Number of Board of Directors Meetings	6.2906 ***	6.0000	2.4563	1.0000	23.0000
(v) CEO Total Option Grants (% of Total Compensation)	0.3212	0.2923	0.2731	0.0000	1.0000

Notes: *, **, *** represent significance of 1-tailed *t*-test of equality of the means at the 10, 5, and 1 percent levels, respectively. This table provides the descriptive statistics of the key variables for firms with and without M&As. M&A firms are acquirers that are identified from SDC Platinum. M&A deals that are rumors or unsuccessful are excluded. The descriptive statistics are computed from a sample of US publicly traded firms during the period of 1992 to 2005 (excluding financials and utilities) from COMPUSTAT, CRSP, I/B/E/S, and ExecuComp Database. The final sample contains 2,922 firm-year observations with 402 firms that have non-missing values of key variables. There are 594 firm-year observations with M&As and 2,328 firm-year observations without M&As. Panel A reports descriptive statistics of stock market valuations and fundamental firm characteristics. Market valuation variables include: (i) Tobin's *Q*, computed as the market value of equity plus the book value of assets minus the book value of equity, scaled by book assets, (ii) the momentum returns as the stock returns in the previous 12-month period, and (iii) the market sentiment index, as constructed by Baker and Wurgler (2002). The market sentiment index is estimated according to Equation (3) in Baker and Wurgler (2002). Fundamental firm characteristics include: (i) new shares issues, calculated as prices multiplied by changes in share-outstanding, scaled by beginning-of-year market capitalization, (ii) Beta (estimated using OLS, from a standard CAPM model on value-weighted market returns over a rolling five-year period), (vi) firm-specific risk (estimated from CAPM residual variance), and (vii) firm age. Panel B reports descriptive statistics of CEO and board of director characteristics for firms with and without M&As. These variables include: (i) log(CEO's tenure), (ii) CEO Equity (as % of total shares), CEO's In-the-Money Exercisable Options (as % of earnings), (iii) CEO's In-the-Money Exercisable Options (as % of earnings), (iv) CEO's In-the-Money Exercisable Options (% of earnings), and (v) CEO Total Option Grants (% of Total Compensation)

2005 (including the bubble period). The higher average Tobin's Q is also observed by Baker *et al.* (2003).

Consistent with the literature on stock market-driven M&As and merger waves, all three market valuation measures are statistically higher for M&A firms, as compared to non-M&A firms, suggesting that M&A activities are related to higher market valuation. When comparing the firm characteristics of M&A firms and non-M&A firms, we find that the former have higher growth in debt issues, higher log(cash flows), lower dividend payout ratios, higher Beta, lower residual variance, and lower log(firm age). There are no significant differences in the means of new shares issues for M&A and non-M&A firms.

Panel B of Table I provides the descriptive statistics of the managerial characteristic variables. The average log(CEO tenure) is 1.9318, whilst the average of CEO equity shares, normalized by total equity, is 6.3493 per cent, indicating that CEOs generally do not own large equity stakes. Equity is clearly the major component of CEO compensation, accounting for 69.34 per cent of all compensation; and indeed, we find that 75.22 per cent of the CEOs have executive options included in their compensation packages. Further examination (results not reported in Table I) suggests that 97.19 per cent of the firms in the sample offer compensation packages to their CEOs which are sensitive to stock market valuation (with such packages including either equity or options).

The average value of in-the-money executive options normalized by net income is 0.0425. The average number of board meetings per year is 6.4373; some firms may have only one meeting, whereas others may have as many as 23 meetings. The average of CEO total option grants normalized by total compensation is 0.3381. When comparing M&A firms with non-M&A firms, we find that the CEOs in acquiring firms have higher equity ownership, higher in-the-money executive options (scaled by net income), higher options compensation (scaled by total compensation), and higher numbers of board meetings.

Finally, further examination (results not reported in Table I) shows that in more than 91.65 per cent (2,678 of 2,922) of the observations, CEOs are serving as board directors; in 14.78 per cent (432 of 2,922) of the observations, CEOs received long-term incentive plan in their compensation packages.

4. Empirical results

Using the dataset and empirical framework described in section 3, we examine the influences of market valuation on corporate M&A decisions and the value implications of such market-driven M&As with regard to the different types of M&A and different managerial characteristics. In particular, we explore the ways in which CEO compensation and incentives affect the method of payment selected, the premiums paid, the timing of M&As and the post-M&A performance of the acquiring firms.

4.1 Stock market influences on M&A decisions

Corporate M&A decisions may be influenced not only by the stock market, but also by other managerial considerations. We therefore use a logit model to estimate the effects of stock market valuation on different types of M&As, categorized by the exchange medium. We examine:

- all mergers (Model 1);
- stock-financed mergers (Model 2); and
- cash-financed mergers (Model 3)[14].

The results of the logit model for the different types of M&As (reported in Table II) are obtained using the Huber/White/Sandwich estimation of robust variance with clustered standard errors adjusted for intra-group correlation. The cluster variance estimator is robust to misspecification and within-cluster correlation[15]. Model (1) examines the impact of different market valuation measures on overall M&A decisions, with Tobin's Q being found to have a significant and positive impact on the likelihood of M&As across firms.

Nevertheless, the positive coefficients of the momentum returns and the market sentiment index are not significant, a finding which suggests that the valuation of firm-specific fundamental information is an important determinant for M&A decisions as a whole, whilst the different types of M&As in Models (2) and (3) are influenced by the valuation measures of the different information sets.

Model (1) also shows that operating cash flows and new debt issues have significantly positive coefficients, a result that is consistent with the notion that higher cash flows and more external financing increases the opportunities for corporate acquisitions. In contrast, an increase in the payout ratio reduces the likelihood of acquisition decisions, suggesting possibilities that dividends may:

- reduce firms' financial flexibility and capability to take on large investment projects, such as M&As; and
- reduce the free-cash-flow problem, where acquisitions are often a reflection of the self-interest behavior of managers, such as empire building.

Model (2) examines the impacts on M&A decisions, similar to Model (1), where stocks are the exchange medium, showing that market valuation has a greater impact on stock-financed acquisitions; this is consistent with Shleifer and Vishny (2003), in which it was demonstrated that when firms' stocks are overvalued, managers will issue cheap equity to engage in acquisitions. As compared to the cash-financed M&A decisions in Model (3), stock-financed M&A decisions are more sensitive to the valuation of firm-specific fundamental information (Tobin's Q). Whilst firm-specific momentum returns have a positive effect on cash-financed M&A decisions, they have a negative effect on stock M&A decisions, which suggests that managers are more likely to take advantage of any market overvaluation where this is related to firm fundamental information (for example, overstated growth expectations).

Following a period during which a firm's stocks outperform the market (when this may not be supported by firm fundamental information, as measured by the momentum returns), managers will try to avoid stock-financed M&As, essentially because suspicion within the market of an agency problem can drag down share prices. Such concerns are alleviated when the whole market follows the same trend (as measured by the market sentiment index). This finding supports the argument of Rhodes-Kropf *et al.* (2005), that merger intensity has a positive correlation with market-wide pricing errors. The results presented in Table II are consistent with $H1$. We further examine the influence of stock market valuation on M&A decisions using a Tobit model to account for both the occurrence of M&A decisions and the size effect of M&A deals (results not reported here). Similar to Model (1), we find that whilst Tobin's Q has a significantly positive effect on the size of the M&A deals across firms, no similar significant impacts are discernible for either the momentum returns or the market sentiment index.

Dependent variables: prob (acquisition decision)	Model (1) All acquisitions	Model (2) Stock-financed acquisitions	Model (3) Cash-financed acquisitions
<i>Explanatory variables</i>			
<i>Stock market valuation</i>			
(i) Tobin's Q	0.1015 (2.23)**	0.2243 (4.39)***	-0.0145 (-0.32)
(ii) Momentum	0.1000 (0.73)	-0.5187 (-1.98)**	0.3109 (2.27)**
(iii) Market Sentiment Index	0.1185 (1.46)	0.2403 (1.97)**	0.1124 (1.27)
<i>Fundamental firm characteristics</i>			
(i) New shares issues	0.3367 (1.13)	1.2346 (4.73)***	-0.0371 (-0.13)
(ii) Growth in debt issues	0.0329 (2.64)***	0.0089 (1.47)	0.0217 (2.52)**
(iii) log(operating cash flows)	0.2625 (5.43)***	0.1763 (1.98)**	0.2913 (5.86)***
(iv) Payout ratio	-0.3945 (-2.45)**	-0.3505 (-0.95)	-0.3593 (-2.22)**
(v) Beta	0.1276 (0.90)	0.2492 (1.10)	0.0532 (0.39)
(vi) Firm-specific risk	-2.1382 (-0.89)	1.8514 (0.47)	-2.1567 (-0.84)
(vii) Firm age	-0.1620 (-1.26)	-0.0930 (-0.45)	-0.1616 (-1.24)
Constant	-2.2975 (-4.13)***	-4.661 (-4.71)***	-2.3698 (-4.30)***
Adjusted R^2	0.0467	0.0801	0.0387
χ^2 -test	62.74***	80.528***	58.50***
Number of observations	2,240	2,240	2,240

Notes: *, **, *** Significant at the 10, 5, and 1 percent level, respectively. This table reports the results of LOGIT model of stock market influences on mergers and acquisitions decisions. To examine how stock market valuations affect firm's M&A decision as a discrete choice model, we estimate the following regression equations:

$$\text{Prob}(\text{M\&A}_{it}) = \alpha + \beta \text{Valuation}_{it-1} + \gamma \text{Control}_{it-1} + \varepsilon_{it}$$

Dependent variables in Models (1) to (3) are probability of all acquisition decisions, probability of stock-financed acquisition decisions, and probability of cash-financed acquisition decisions respectively. Stock market valuation variables (Valuation_{it}) include: (i) Tobin's Q , computed as the market value of equity plus the book value of assets minus the book value of equity, scaled by book assets, (ii) the momentum returns as the stock returns in the previous twelve-month period, and (iii) the market sentiment index, as constructed by Baker and Wurgler (2002). The market sentiment index is estimated according to Equation (3) in Baker and Wurgler (2002). Other control variables (Control_{it}) include: (i) new shares issues, calculated as prices multiplied by changes in share-outstanding, scaled by beginning-of-year market capitalization, (ii) growth in debt issues, defined as percentage changes in long-term debt, (iii) the log of cash flows, (iv) the payout ratio (defined as dividend-to-earnings), (v) Beta (estimated using OLS, from a standard CAPM model on value-weighted market returns over a rolling five-year period), (vi) firm-specific risk (estimated from CAPM residual variance), and (vii) firm age. The results are obtained with the Huber/White/sandwich estimator of robust variance estimates and clustered standard errors adjusted for cluster (within firm) correlation. Heteroskedastic-consistent t -ratios are presented in parentheses

Table II.
LOGIT model of stock market-driven acquisitions

4.2 Agency costs of stock market-driven acquisitions

In this section, we estimate the effects of acquisition decisions on future firm performance across different sample groups of CEO characteristics and M&A types. *H2* states that managers whose performance evaluation and incentive schemes are tied to the price performance of their stocks will tend to respond to market valuations when engaging in M&A decisions. Methodologically, we adopt the two-stage treatment-effect model as a discrete choice variable in the first stage to estimate such acquisition decisions; then, in the second stage, we examine the impact of this endogenous choice on the future performance of firms.

As shown in Equations (2) and (3), in the first stage, we use the three market valuation measures as a covariate to predict the likelihood of M&As. In the second stage, future firm performance is regressed on the endogenous covariate of M&A decisions and the control variables[16]. The two-stage treatment-effect model is also estimated for different groups of CEO characteristics and M&A types[17].

4.2.1 *All M&As*. Table III summarizes the results of the second-stage estimation of the impact of stock market-driven M&As (as an endogenous binary treatment) on future firm performance. The results in Panels A and B of Model (1) show that stock market-driven M&As have significantly negative impacts on the future operating performance of firms, but no significant impacts on their future stock market performance.

The results in Panels A and B of Models (2) and (3) indicate that the negative effects of market-driven acquisitions on the operating and stock performance of firms are greater for CEOs with low tenure, suggesting that inexperienced CEOs are more likely to make value-destroying M&A decisions. This finding contradicts the results of Huson *et al.* (2001) and Milbourn (2003), who argue that tenure has a negative association with managerial horizons. One possible explanation for this is that newer CEOs (who do not yet have well-established track records) are likely to be keen to boost their reputation by engaging in distorting action to enhance their short-term performance[18].

Panel A of Model (4) shows that when CEOs own less equity stake, market-driven acquisitions have significantly negative impacts on the operating performance of firms (but not on their stock market performance). This is consistent with the finding of Song (2007), who noted that insider-selling mergers experience lower prices and operating performance than their insider-buying counterparts in the years following a merger. The finding is also in line with that of Lewellen *et al.* (1985) who argue that negative value implications are more pronounced for acquiring firms with less managerial ownership.

The results in Panels A, A.1, B and B.1 of Models (7) and (15) suggest that market-driven acquisitions by CEOs with high exercisable in-the-money options and high total options compensation have significantly negative impacts on the operating and stock market performance of firms. The level of holdings of managerial options and options compensation exhibit an inverse relationship to the consequences of market-driven acquisitions. This finding provides support for *H2*, indicating that stock market-driven M&As have greater negative impacts on firm performance when CEOs' stock options are more sensitive to stock price gyrations. The finding is also consistent with the argument of Jensen (2005) on the agency problem of overvalued equity, and further suggests that stock options, not equity shares, induce managers to pursue value-destroying market-driven M&As.

	Endogenous binary treatment: M&A decision	Number of observations
<i>Panel A. Predicting 1-year ahead Growth in Earnings (Second Stage Regression)</i>		
<i>Dependent variable: 1-year ahead growth in earnings</i>		
Model (1) All firms		
<i>N</i>	-1.1519	2,036
Heteroskedastic-consistent <i>t</i> -ratio	-1.73**	
Model (2) CEO's tenure low		
<i>N</i>	-2.7027	7,739
Heteroskedastic-consistent <i>t</i> -ratio	-2.19***	
Model (3) CEO's tenure high		
<i>N</i>	-1.4028	558
Heteroskedastic-consistent <i>t</i> -ratio	-1.4028	
Model (4) CEO equity (% of total shares): Low		
<i>N</i>	-1.5088	531
Heteroskedastic-consistent <i>t</i> -ratio	-1.97**	
Model (5) CEO equity (% of total shares): High		
<i>N</i>	0.7666	447
Heteroskedastic-consistent <i>t</i> -ratio	-0.72	
Model (6) CEO in-the-money exercisable options (% of earnings): Low		
<i>N</i>	0.3364	998
Heteroskedastic-consistent <i>t</i> -ratio	-0.28	
Model (7) CEO in-the-money exercisable options (% of earnings): High		
<i>N</i>	-2.723	1,023
Heteroskedastic-consistent <i>t</i> -ratio	-3.17***	
<i>Panel A1. Predicting 1-year ahead Growth in Earnings (Second Stage Regression)</i>		
<i>Dependent variable: 1-year ahead growth in earnings</i>		
Model (8) CEO as Board of Director: Yes		
<i>N</i>	-1.6189	1,834
Heteroskedastic-consistent <i>t</i> -ratio	-2.32***	
Model (9) CEO as Board of Director: No		
<i>N</i>	3.1598	202
Heteroskedastic-consistent <i>t</i> -ratio	0.75	
Model (10) CEO's long-term incentive: Yes		
<i>N</i>	0.6596	396
Heteroskedastic-consistent <i>t</i> -ratio	0.82	
Model (11) CEO's long-term incentive: No		
<i>N</i>	-1.5284	1,640
Heteroskedastic-consistent <i>t</i> -ratio	-1.88**	
Model (12) Number of Board of Directors meetings: Low		
<i>N</i>	-0.9115	
Heteroskedastic-consistent <i>t</i> -ratio	-1.03	1,184
Model (13) Number of Board of Directors meetings: High		
<i>N</i>	-0.1485	820
Heteroskedastic-consistent <i>t</i> -ratio	-0.18	
Model (14) CEO total option grants (% of total compensation): Low		
<i>N</i>	4.4052	984
Heteroskedastic-consistent <i>t</i> -ratio	1.17	

(continued)

Table III.
Stock market-driven acquisitions and firm performances

	Endogenous binary treatment: M&A decision	Number of observations
Model (15) CEO total option grants (% of total compensation): High		
<i>N</i>	- 1.6463	1,032
Hetroskedastic-consistent <i>t</i> -ratio	- 2.31 **	
<i>Panel B. Predicting 1-year ahead CARs (Second Stage Regression)</i>		
<i>Dependent variable: 1-year ahead CARs</i>		
Model (1) All firms		
<i>N</i>	- 0.1198	1,751
Hetroskedastic-consistent <i>t</i> -ratio	- 0.58	
Model (2) CEO's tenure low		
<i>N</i>	- 0.7237	625
Hetroskedastic-consistent <i>t</i> -ratio	- 1.85 *	
Model (3) CEO's tenure high		
<i>N</i>	10.41	445
Hetroskedastic-consistent <i>t</i> -ratio	- 0.41	
Model (4) CEO equity (% of total shares): Low		
<i>N</i>	- 0.2144	435
Hetroskedastic-consistent <i>t</i> -ratio	- 0.82	
Model (5) CEO equity (% of total shares): High		
<i>N</i>	0.4075	377
Hetroskedastic-consistent <i>t</i> -ratio	1.06	
Model (6) CEO in-the-money exercisable options (% of earnings): Low		
<i>N</i>	0.7411	880
Hetroskedastic-consistent <i>t</i> -ratio	1.78 *	
Model (7) CEO in-the-money exercisable options (% of earnings): High		
<i>N</i>	- 0.7916	859
Hetroskedastic-consistent <i>t</i> -ratio	- 2.59	
<i>Panel B.1. Predicting 1-year ahead CARs (Second Stage Regression)</i>		
<i>Dependent variable: 1-year ahead CARs</i>		
Model (8) CEO as Board of Director: Yes		
<i>N</i>	- 0.2372	1,558
Hetroskedastic-consistent <i>t</i> -ratio	- 1.35 *	
Model (9) CEO as Board of Director: No		
<i>N</i>	3.5757	193
Hetroskedastic-consistent <i>t</i> -ratio	1.14	
Model (10) CEO's long-term incentive: Yes		
<i>N</i>	0.0084	342
Hetroskedastic-consistent <i>t</i> -ratio	0.03	
Model (11) CEO's long-term incentive: No		
<i>N</i>	- 0.3148	1,409
Hetroskedastic-consistent <i>t</i> -ratio	- 1.31 *	
Model (12) Number of Board of Directors meetings: Low		
<i>N</i>	0.3020	1,032
Hetroskedastic-consistent <i>t</i> -ratio	1.06	
Model (13) Number of Board of Directors meetings: High		
<i>N</i>	- 0.3706	693
Hetroskedastic-consistent <i>t</i> -ratio	- 1.47	

Table III.

(continued)

	Endogenous binary treatment: M&A decision	Number of observations
Model (14) CEO total option grants (% of total compensation): Low		
<i>N</i>	0.5968	835
Hetroskedastic-consistent <i>t</i> -ratio	0.64	
Model (15) CEO total option grants (% of total compensation): High		
<i>N</i>	-0.2234	899
Hetroskedastic-consistent <i>t</i> -ratio	-1.59*	

Notes: *, **, *** Significant at the 10, 5, and 1 percent level, respectively.

This table reports the impacts of stock market-driven acquisitions on firm operating and stock performances across different sample groups of CEO and board of director characteristics. The M&A decision is defined as: $I_{\{M\&A\}it} = 1$ if firms becomes an acquirer and = 0, otherwise. The two-stage estimation procedure is summarized as follows. In the first-stage, stock market driven acquisition decision (an endogenous binary treatment) is estimated as:

$$I_{\{M\&A\}it} = a_0 + a_1 \text{Tobin's } Q_{it-1} + a_2 \text{ Momentum Returns}_{it-1} + a_3 \text{ Market Sentiment Index}_{t-1} + u_{it}$$

where the explanatory variables include different measures of stock market valuation: (i) Tobin's *Q*, computed as the market value of equity plus the book value of assets minus the book value of equity, scaled by book assets, (ii) momentum returns, defined as the stock returns over the previous 12 months, and (iii) the market sentiment index, as constructed by Baker and Wurgler (2002). In the second-stage, the impact of stock market driven acquisition decision on firm future operating and stock performances is estimated as:

$$Y_{it+1} = b_0 + b_1 I_{\{M\&A\}it} + b_2 \text{Control}_{it-1} + e_{it}$$

where $e_i \sim N(0, s)$; $u_i \sim N(0, 1)$; $\text{corr}(e_i, u_i) = r$. In the second stage, future firm performance measures are regressed on endogenous covariate acquisition decisions $I_{\{M\&A\}it}$ and the control variables Control_{it-1} for firm characteristics. The control variables include: (i) new equity issues, calculated as prices multiplied by changes in share-outstanding, scaled by beginning-of-year market capitalization, (ii) new debt issues, defined as percentage changes in long-term debt, (iii) log of cash flows, (iv) the payout ratio (defined as dividend-to-earnings), (v) market risk (estimated from CAPM beta), (vi) firm-specific risk (estimated from CAPM residual variance), (vii) firm size (defined as log of market capitalization) and, (viii) firm age. Panel A reports the impacts of stock market valuation on acquisition decisions (coefficient of b_1 in the second-stage model) for firms grouped by: (i) CEO's tenure; (ii) CEO's equity ownership stake as percentage of total equity of the firm; (iii) stock options percentage of CEO's total compensations; (iv) firms grouped by the value of exercisable in-the-money stock options as percentage of earnings; (v) whether CEO serves as director; (vi) whether CEO has long-term incentive compensations; and (vii) the number of board of directors meetings. Panel B reports the impacts of stock market-driven acquisitions on firms' future stock performances (1-year ahead CARs) for firms grouped by the same set of variables used in Panel A. The treatment effect model is estimated with two-step consistent estimates of the parameters, standard errors, and covariance matrix

Table III.

Although both Datta *et al.* (2001) and Harford (2003) were able to demonstrate that the M&A announcement returns for bidder CEOs with high equity-based compensation are significantly better than those for bidder CEOs with low equity-based compensation, in this study we find that, with regard to stock market-driven M&As, equity shares and stock options seem to create different incentives for managers. Compensation by means of stocks increases the equity stake of managers, thereby mitigating the value-destroying effect of market-driven M&As; on the other hand, options compensation presents managers with incentives for risk taking and empire

building, leading to such managers taking sub-optimal (value-destroying) market-driven M&A decisions.

These findings help to shed some light on the optimal design of managerial compensation. Consistent with Meulbroek (2001), Hall and Murphy (2002) and Dittmann and Ernst (2007), this study argues that stock options exacerbate the agency problem of market-driven M&As, and that they therefore represent an inefficient mechanism for compensating executives; these findings do not, however, accord with those of Aseff and Santos (2005) and Kadan and Swinkels (2006).

Panels A.1 and B.1 of Model (8) show that the market-driven M&As in which they engage will be more value destroying, as measured by both operating and stock market performance, when CEOs are able to exert influence on the board of directors. CEOs serving as board directors affect corporate governance and monitoring; a result which, consistent with *H3*, suggests that poor corporate governance and monitoring encourage managers to indulge in agency-related M&As, confirming the findings of Bebchuk and Fried (2003) and Masulis *et al.* (2007). Models (12) and (13) examine the ways in which the number of board meetings can affect the performance of market-driven M&As. In principle, the frequency of board meetings should indicate the intervention by boards in the operational decision making of CEOs[19]. Our investigation of whether board meetings exacerbate or mitigate the agency problems associated with market-driven M&As provides inconclusive results for the sample of all M&As; however, Panels A.1 and B.1 of Model (11) show that market-driven M&As have much greater and significantly negative impacts on the operating and stock market performance of firms where the CEOs have no long-term incentive plans.

Consistent with *H2*, this finding suggests that myopic managers with no long-term incentive plans are more likely to be misguided by the stock market and make sub-optimal M&A decisions which will ultimately reduce shareholder value. We stated in *H2* that managers whose compensation packages include long-term incentive plans will tend to focus more on the long-term value of the firm; thus, they are perhaps less likely to be affected by short-term, transient changes in the stock market. This finding demonstrates that managerial horizons are an important determinant of the stock market influence on M&A decisions, eventually affecting M&A outcomes.

In summary, managers with short-term horizons will invariably make M&A decisions which correspond to stock market valuation, with such market-driven M&As being value destroying, essentially because they arise from agency problems such as empire building and catering to the market. As stated in *H2* and *H3*, sub-optimal market-driven M&As are more likely to be pursued by managers whose compensation packages are sensitive to stock prices, and firms with poor corporate governance.

4.2.2 Stock-financed M&As. Table IV summarizes the results of the second-stage estimation for the impact of stock market-driven M&As (as an endogenous binary treatment) on future firm performance. As suggested by Shleifer and Vishny (2003), market mispricing creates strong incentives for firms to use overvalued equity to finance their M&A activities; Panels A and B of Model (1) show that significantly negative impacts are discernible on one-year ahead earnings growth and one-year ahead CARs for market-driven M&As which are financed by stocks[20]. The negative impacts are more pronounced for such M&As, relative to the impacts for the sample of

	Endogenous binary treatment: M&A decision	Number of observations
<i>Panel A. Predicting 1-year ahead growth in earnings (second stage regression)</i>		
Dependent variable: 1-year ahead growth in earnings		
Model (1) All firms		
<i>N</i>	-1.89737	2,036
Heteroskedastic-consistent <i>t</i> -ratio	-2.67***	
Model (2) CEO's tenure low		
<i>N</i>	-5.2147	739
Heteroskedastic-consistent <i>t</i> -ratio	-3.35***	
Model (3) CEO's tenure high		
<i>N</i>	-3.4865	-3.35
Heteroskedastic-consistent <i>t</i> -ratio	-2.11**	
Model (4) CEO equity (% of total shares): Low		
<i>N</i>	-2.4917	531
Heteroskedastic-consistent <i>t</i> -ratio	-1.87**	
Model (5) CEO equity (% of total shares): High		
<i>N</i>	-0.1078	447
Heteroskedastic-consistent <i>t</i> -ratio	-0.05	
Model (6) CEO in-the-money exercisable options (% of earnings): Low		
<i>N</i>	-0.2061	998
Heteroskedastic-consistent <i>t</i> -ratio	-0.16	
Model (7) CEO in-the-money exercisable options (% of earnings): High		
<i>N</i>	-2.9008	1,023
Heteroskedastic-consistent <i>t</i> -ratio	-3.81***	
<i>Panel A1. Predicting 1-year ahead growth in earnings (second stage regression)</i>		
Dependent variable: 1-year ahead growth in earnings		
Model (8) CEO as Board of Director: Yes		
<i>N</i>	-2.3457	1,834
Heteroskedastic-consistent <i>t</i> -ratio	-3.10***	
Model (9) CEO as Board of Director: No		
<i>N</i>	1.0609	202
Heteroskedastic-consistent <i>t</i> -ratio	0.72	
Model (10) CEO's long-term incentive: Yes		
<i>N</i>	0.0875	396
Heteroskedastic-consistent <i>t</i> -ratio	0.08	
Model (11) CEO's long-term incentive: No		
<i>N</i>	-2.2143	1,640
Heteroskedastic-consistent <i>t</i> -ratio	-2.59***	
Model (12) Number of Board of Directors meetings: Low		
<i>N</i>	-1.5460	1,184
Heteroskedastic-consistent <i>t</i> -ratio	-1.61	
Model (13) Number of Board of Directors meetings: High		
<i>N</i>	-1.9176	820
Heteroskedastic-consistent <i>t</i> -ratio	-1.85**	
Model (14) CEO total option grants (% of total compensation): Low		
<i>N</i>	-13.5713	984
Heteroskedastic-consistent <i>t</i> -ratio	-0.99	
		(continued)

Table IV.
Stock market driven
acquisitions and firm
performances – case for
stock-financed
acquisitions

	Endogenous binary treatment: M&A decision	Number of observations
Model (15) CEO total option grants (% of total compensation): High		
<i>N</i>	-1.7575	1,032
Heteroskedastic-consistent <i>t</i> -ratio	-2.53**	
<i>Panel B. Predicting 1-year ahead CARs (second stage regression)</i>		
Dependent variable: 1-year ahead CARs		
Model (1) All firms		
<i>N</i>	-0.3530	1,751
Heteroskedastic-consistent <i>t</i> -ratio	-1.65**	
Model (2) CEO's tenure low		
<i>N</i>	-1.2497	625
Heteroskedastic-consistent <i>t</i> -ratio	-2.76***	
Model (3) CEO's tenure high		
<i>N</i>	-0.5316	445
Heteroskedastic-consistent <i>t</i> -ratio	-1.18	
Model (4) CEO equity (% of total shares): Low		
<i>N</i>	-0.6083	435
Heteroskedastic-consistent <i>t</i> -ratio	-1.56*	
Model (5) CEO equity (% of total shares): High		
<i>N</i>	0.1243	377
Heteroskedastic-consistent <i>t</i> -ratio	0.22	
Model (6) CEO in-the-money exercisable options (% of earnings): Low		
<i>N</i>	0.3479	880
Heteroskedastic-consistent <i>t</i> -ratio	0.94	
Model (7) CEO in-the-money exercisable options (% of earnings): High		
<i>N</i>	-0.8724	859
Heteroskedastic-consistent <i>t</i> -ratio	-3.33***	
<i>Panel B1. Predicting 1-year ahead CARs (second stage regression)</i>		
Dependent variable: 1-year ahead CARs		
Model (8) CEO as Board of Director: Yes		
<i>N</i>	-0.4365	1,558
Heteroskedastic-consistent <i>t</i> -ratio	-1.98***	
Model (9) CEO as Board of Director: No		
<i>N</i>	1.141	193
Heteroskedastic-consistent <i>t</i> -ratio	2.16***	
Model (10) CEO's long-term incentive: Yes		
<i>N</i>	-0.1571	342
Heteroskedastic-consistent <i>t</i> -ratio	-0.46	
Model (11) CEO's long-term incentive: No		
<i>N</i>	-0.4514	1,409
Heteroskedastic-consistent <i>t</i> -ratio	-1.73**	
Model (12) Number of Board of Directors meetings: Low		
<i>N</i>	-0.1132	1,032
Heteroskedastic-consistent <i>t</i> -ratio	-0.40	
Model (13) Number of Board of Directors meetings: High		
<i>N</i>	-0.5833	693
Heteroskedastic-consistent <i>t</i> -ratio	-1.83	

(continued)

Table IV.

	Endogenous binary treatment: M&A decision	Number of observations
Model (14) CEO total option grants (% of total compensation): Low		
<i>N</i>	-7.5229	835
Heteroskedastic-consistent <i>t</i> -ratio	-1.37	
Model (15) CEO total option grants (% of total compensation): High		
<i>N</i>	-0.3206	899
Heteroskedastic-consistent <i>t</i> -ratio	-1.62*	

Notes: *, **, *** Significant at the 10, 5, and 1 percent level, respectively. This table reports the impacts of (stock market driven) stock-financed acquisitions on firm operating and stock performances across different sample groups of CEO and board of director characteristics. The M&A decision is defined as: $I_{\{M\&A\text{Decision}\}it} = 1$ if firms with stock-financed acquisitions and $= 0$, otherwise. The two-stage estimation procedure is summarized as follows. In the first-stage, stock-financed acquisition decision (an endogenous binary treatment) is estimated as:

$$I_{\{M\&A\text{Decision}\}it} = a_0 + a_1 \text{Tobin's } Q_{it-1} + a_2 \text{ Momentum Returns}_{it-1} + a_3 \text{ Market Sentiment Index}_{t-1} + u_{it}$$

where the explanatory variables include different measures of stock market valuation: (i) Tobin's *Q*, computed as the market value of equity plus the book value of assets minus the book value of equity, scaled by book assets, (ii) momentum returns, defined as the stock returns over the previous 12 months, and (iii) the market sentiment index, as constructed by Baker and Wurgler (2002). In the second-stage, the impact of stock market driven acquisition decision on firm future operating and stock performances is estimated as:

$$Y_{it+1} = b_0 + b_1 I_{\{M\&A\text{Decision}\}it} + b_2 \text{Control}_{it-1} + e_{it}$$

where $e_i \sim N(0, s)$; $u_i \sim N(0, 1)$; $\text{corr}(e_i, u_i) = r$. In the second stage, future firm performance measures are regressed on endogenous covariate acquisition decisions $I_{\{M\&A\text{Decision}\}it}$ and the control variables Control_{it-1} for firm characteristics. The control variables include: (i) new equity issues, calculated as prices multiplied by changes in share-outstanding, scaled by beginning-of-year market capitalization, (ii) new debt issues, defined as percentage changes in long-term debt, (iii) log of cash flows, (iv) the payout ratio (defined as dividend-to-earnings), (v) market risk (estimated from CAPM beta), (vi) firm-specific risk (estimated from CAPM residual variance), (vii) firm size (defined as log of market capitalization) and (viii) firm age. Panel A reports the impacts of stock market valuation on acquisition decisions (coefficient of b_1 in the second-stage model) for firms grouped by: (i) CEO's tenure; (ii) CEO's equity ownership stake as percentage of total equity of the firm; (iii) stock options percentage of CEO's total compensations; (iv) firms grouped by the value of exercisable in-the-money stock options as percentage of earnings; (v) whether CEO serves as director; (vi) whether CEO has long-term incentive compensations; and (vii) the number of board of directors meetings. Panel B reports the impacts of stock market driven acquisitions on firms' future stock performances (1-year ahead CARS) for firms grouped by the same set of variables used in Panel A. The treatment effect model is estimated with two-step consistent estimates of the parameters, standard errors, and covariance matrix

Table IV.

all M&As; and indeed, there are positive impacts for the group of cash-financed M&As (results not reported here).

Panels A and B of Model (2) indicate that stock M&As have significantly greater negative impacts on future operating and stock market performance where the CEO is less experienced. For CEOs with shorter tenure, the magnitude of the negative value impacts of stock M&As (Model 2) are twice as large as those for all M&As (Model 1),

and significantly larger than those for CEOs with longer tenure (Model 3). It is therefore clear that inexperienced CEOs using their firms' stocks for market-driven M&As reduce their firm value to a much greater extent.

Panels A and B of Model (4) show that where the CEO has low equity ownership, stock M&As have significantly negative impacts on one-year ahead earnings growth and one-year ahead CARs. Panels A, A.1, B and B.1 of Models (7) and (15) also indicate that in those cases where CEOs receive high exercisable in-the-money options and high total options compensation, stock M&As have significantly negative impacts on the operating and stock market performance of such firms.

Panels A.1 and B.1 of Model (8) suggest that in those firms where CEOs serve as board directors, stock M&As have significantly negative impacts on one-year ahead earnings growth and one-year ahead CARs. Model (11) demonstrates that where compensation packages include long-term incentive plans, this can mitigate the negative impacts of stock M&As on the operating and stock market performance of firms.

Finally, Panels A.1 and B.1 of Model (13) show that where firms have greater numbers of board meetings, stock M&As have much greater and significantly negative impacts on one-year ahead earnings growth and one-year ahead CARs, with no apparent moderating effect on the agency problems of market-driven M&As. We argue that excessive board meetings could be an indicator of rising conflict between managers and board directors since, as opposed to indicating better monitoring of the actions of managers, more frequent board meetings may merely represent deteriorating governance problems during periods of dramatic change, such as M&As[21]. This result indicates that convening more board meetings is not necessarily an efficient governance mechanism, since stock M&As become more value destroying with more frequent board meetings.

Consistent with *H4*, the negative coefficients for stock-financed mergers (Table IV) are generally greater and more significant than those for all mergers (Table III); this indicates that the value destruction of market-driven M&As is more severe when such M&As are financed by stocks. However, an alternative explanation for this finding could simply be that managers prefer to finance their M&As by stock, as opposed to cash, at times when their stocks are over-valued[22]. Such M&A decisions which correspond to the level of stock overvaluation are, however, most likely to be sub-optimal and value destroying.

4.2.3 M&As with high bid premiums. High bid premiums could be a sign of managerial overconfidence and hubris in those cases where such overconfidence with regard to expected M&A synergies result in overpayment to the target company (Roll, 1986). In their study of stock-financed mergers, Fu and Lin (2008) find that overvalued bidders are more likely to overpay their targets and are subject to inferior post-merger operating performance.

The results of the second-stage estimation of the impacts of M&As with high bid premiums on future firm performances are summarized in Table V. The bid premium is measured by the difference between the final bidding price paid by the bidder and the preceding one-week average market price of the target[23]. High bid premium is defined as the case where the bid premium is greater than 31.73% (the median of the sample)[24]. Table V also indicates that market-driven M&As with high bid premiums have significantly negative impacts on future operating and stock market performance for firms whose CEOs have shorter tenure (Model 2), less managerial equity stake

Panel A. Predicting 1-year ahead growth in earnings (second stage regression)

Dependent variable: 1-year ahead growth in earnings

	Endogenous binary treatment: M&A decision	Number of observations
Model (1) All firms		
<i>N</i>	-2.7768	2,036
Heteroskedastic-consistent <i>t</i> -ratio	-1.65*	
Model (2) CEO's tenure low		
<i>N</i>	-8.3821	-1.65
Heteroskedastic-consistent <i>t</i> -ratio	-1.76*	
Model (3) CEO's tenure high		
<i>N</i>	-2.2441	558
Heteroskedastic-consistent <i>t</i> -ratio	-1.32	
Model (4) CEO equity (% of total shares): Low		
<i>N</i>	-5.6976	531
Heteroskedastic-consistent <i>t</i> -ratio	-1.62*	
Model (5) CEO equity (% of total shares): High		
<i>N</i>	-0.6471	447
Heteroskedastic-consistent <i>t</i> -ratio	-0.36	
Model (6) CEO in-the-money exercisable options (% of earnings): Low		
<i>N</i>	25.21	998
Heteroskedastic-consistent <i>t</i> -ratio	-0.21	
Model (7) CEO in-the-money exercisable options (% of earnings): High		
<i>N</i>	-2.9182	1,023
Heteroskedastic-consistent <i>t</i> -ratio	-2.40**	

Panel A1. Predicting 1-year ahead growth in earnings (second stage regression)

Dependent variable: 1-year ahead growth in earnings

Model (8) CEO as Board of Director: Yes		
<i>N</i>	-3.1536	1,834
Heteroskedastic-consistent <i>t</i> -ratio	-1.86*	
Model (9) CEO as Board of Director: No		
<i>N</i>	0.6582	202
Heteroskedastic-consistent <i>t</i> -ratio	0.10	
Model (10) CEO's in-the incentive: Yes		
<i>N</i>	-0.2617	396
Heteroskedastic-consistent <i>t</i> -ratio	-0.18	
Model (11) CEO's long-term incentive: No		
<i>N</i>	-3.9227	1,640
Heteroskedastic-consistent <i>t</i> -ratio	-1.55*	
Model (12) Number of Board of Directors meetings: Low		
<i>N</i>	-1.4905	1,184
Heteroskedastic-consistent <i>t</i> -ratio	-0.94	
Model (13) Number of Board of Directors meetings: High		
<i>N</i>	1.7167	820
Heteroskedastic-consistent <i>t</i> -ratio	0.58	
Model (14) CEO Total option grants (% of total compensation): Low		
<i>N</i>	-7.0925	984
Heteroskedastic-consistent <i>t</i> -ratio	-1.25	

(continued)

Table V.
Stock market-driven acquisitions and firm performances – case for acquisitions with high bid premium

	Endogenous binary treatment: M&A decision	Number of observations
Model (15) CEO total option grants (% of total compensation): High		
<i>N</i>	- 3.1612	1,032
Heteroskedastic-consistent <i>t</i> -ratio	- 1.68*	
<i>Panel B. Predicting 1-year ahead CARs (second stage regression)</i>		
Dependent variable: 1-year ahead CARs		
Model (1) All firms		
<i>N</i>	- 1.8320	1,751
Heteroskedastic-consistent <i>t</i> -ratio	- 2.20**	
Model (2) CEO's tenure low		
<i>N</i>	- 5.1635	625
Heteroskedastic-consistent <i>t</i> -ratio	- 1.57*	
Model (3) CEO's tenure high		
<i>N</i>	- 0.5315	445
Heteroskedastic-consistent <i>t</i> -ratio	- 0.40	
Model (4) CEO equity (% of total shares): Low		
<i>N</i>	- 4.0358	435
Heteroskedastic-consistent <i>t</i> -ratio	- 1.83**	
Model (5) CEO Equity (% of total shares): High		
<i>N</i>	- 1.1461	377
Heteroskedastic-consistent <i>t</i> -ratio	- 0.73	
Model (6) CEO in-the-money exercisable options (% of earnings): Low		
<i>N</i>	2.5619	880
Heteroskedastic-consistent <i>t</i> -ratio	0.99	
Model (7) CEO in-the-money exercisable options (% of earnings): High		
<i>N</i>	- 2.2965	859
Heteroskedastic-consistent <i>t</i> -ratio	- 2.95***	
<i>Panel B1. Predicting 1-year ahead CARs (second stage regression)</i>		
Dependent variable: 1-year ahead CARs		
Model (8) CEO as Board of Director: Yes		
<i>N</i>	- 1.6486	1,558
Heteroskedastic-consistent <i>t</i> -ratio	- 2.10**	
Model (9) CEO as Board of Director: No		
<i>N</i>	4.9817	193
Heteroskedastic-consistent <i>t</i> -ratio	0.88	
Model (10) CEO's long-term incentive: Yes		
<i>N</i>	- 0.3719	342
Heteroskedastic-consistent <i>t</i> -ratio	- 0.83	
Model (11) CEO's long-term incentive: No		
<i>N</i>	- 5.6622	1,409
Heteroskedastic-consistent <i>t</i> -ratio	- 1.69*	
Model (12) Number of Board of Directors meetings: Low		
<i>N</i>	- 1.0109	1,032
Heteroskedastic-consistent <i>t</i> -ratio	- 1.40	
Model (13) Number of Board of Directors meetings: High		
<i>N</i>	- 2.0618	693
Heteroskedastic-consistent <i>t</i> -ratio	- 1.86*	

Table V.

(continued)

	Endogenous binary treatment: M&A decision	Number of observations
Model (14) CEO total option grants (% of total compensation): Low		
<i>N</i>	- 8.4374	835
Hetroskedastic-consistent <i>t</i> -ratio	- 1.35	
Model (15) CEO total option grants (% of total compensation): High		
<i>N</i>	- 0.3729	899
Hetroskedastic-consistent <i>t</i> -ratio	- 0.48	

Notes: *, **, *** Significant at the 10, 5, and 1 percent level, respectively. This table reports the impacts of (stock market driven) stock-financed acquisitions with high-bid premium on firm operating and stock performances with different groups of firms with CEO characteristics. Bid premium is defined as bidding price paid by the acquirers minus the stock price one week before the M&A completion. The M&A decision is defined as: $I_{\{M\&A\text{Decision}\}it} = 1$ if firms becomes an acquirer with high-bid premium and = 0, otherwise. The two-stage estimation procedure is summarized as follows. In the first-stage, stock acquisition decision with high-bid premium (an endogenous binary treatment) is estimated as:

$$I_{\{M\&A\text{Decision}\}it} = a_0 + a_1 \text{Tobin's } Q_{it-1} + a_2 \text{Momentum Returns}_{it-1} + a_3 \text{Market Sentiment Index}_{t-1} + u_{it}$$

where the explanatory variables include different measures of stock market valuation: (i) Tobin's *Q*, computed as the market value of equity plus the book value of assets minus the book value of equity, scaled by book assets, (ii) momentum returns, defined as the stock returns over the previous 12 months, and (iii) the market sentiment index, as constructed by Baker and Wurgler (2002). In the second-stage, the impact of stock market driven acquisition decision on firm future operating and stock performances is estimated as:

$$Y_{it+1} = b_0 + b_1 I_{\{M\&A\text{Decision}\}it} + b_2 \text{Control}_{it-1} + e_{it}$$

where $e_i \sim N(0, s)$; $u_i \sim N(0, 1)$; $\text{corr}(e_i, u_i) = r$. In the second stage, future firm performance measures are regressed on endogenous covariate acquisition decisions $I_{\{M\&A\text{Decision}\}it}$ and the control variables Control_{it-1} for firm characteristics. The control variables include: (i) new equity issues, calculated as prices multiplied by changes in share-outstanding, scaled by beginning-of-year market capitalization, (ii) new debt issues, defined as percentage changes in long-term debt, (iii) log of cash flows, (iv) the payout ratio (defined as dividend-to-earnings), (v) market risk (estimated from CAPM beta), (vi) firm-specific risk (estimated from CAPM residual variance), (vii) firm size (defined as log of market capitalization) and, (viii) firm age. Panel A reports the impacts of stock market valuation on acquisition decisions (coefficient of b_1 in the second-stage model) for firms grouped by: (i) CEO's tenure; (ii) CEO's equity ownership stake as percentage of total equity of the firm; (iii) stock options percentage of CEO's total compensations; (iv) firms grouped by the value of exercisable in-the-money stock options as percentage of earnings; (v) whether CEO serves as director; (vi) whether CEO has long-term incentive compensations; and (vii) the number of board of directors meetings. Panel B reports the impacts of stock market-driven acquisitions on firms' future stock performances (1-year ahead CARs) for firms grouped by the same set of variables used in Panel A. The treatment effect model is estimated with two-step consistent estimates of the parameters, standard errors, and covariance matrix

Table V.

(Model 4), no long-term incentive plans (Model 11), more options compensation and more in-the-money exercisable options (Models 7 and 15), or where CEOs serve on the board of directors (Model 8).

Although the negative impact on one-year ahead CARs is not significant for the high options compensation sample (Model 15), it is significant for the sample of firms with frequent board meetings (Model 13). As compared to Table III, Table V shows that market-driven M&As with high bid premiums exhibit stronger negative value

implications. Consistent with *H4*, short-horizon managers subject to managerial overconfidence and hubris tend to overpay their targets for private benefits. As a result, there is a clear probability of such market-driven M&As destroying firm value to a greater extent.

Consistent with the findings of Roll (1986) and Aktas *et al.* (2005), who note that managerial overconfidence and hubris are reflected in the CARs observed in M&As, our findings suggest that managerial overconfidence and hubris could represent the fundamental causes of the value destruction in stock market-driven investment.

4.3 Stock market-driven acquisitions during high valuation periods

The extant literature points to the intensification of M&A activities during periods of high valuation (Rhodes-Kropf *et al.*, 2005), periods when the impacts of market-driven M&As are most significant (Bouwman *et al.*, 2007). If high market valuation presents incentives for managers to make inefficient M&A decisions based upon overvalued stocks, these market-driven M&As will be at their most value destroying during such high valuation periods.

Table VI summarizes the results of the second-stage estimation of the impacts of stock market M&As (as endogenous binary treatment) on the future performance of firms during an upturn in the market (when the investor sentiment index is high). Similar to the results reported in Tables IV and V, those in Table VI show that in periods of high valuation, market-driven M&As have significantly negative impacts on the future operating and stock market performance of firms whose CEOs have shorter tenure (Model 2), lower managerial equity stake (Model 4), no long-term incentive plans (Model 11) and greater options compensation and exercisable in-the-money options (Models 7 and 15), as well as those cases where CEOs serve on the board of directors (Model 8). The negative impact on one-year ahead CARs is not significant for the low managerial equity stake sample (Model 4 in Panel B).

The results in Table VI reveal a potential causal link between agency problems and merger waves, an issue which has not yet been fully explored within the literature. Consistent with *H4*, we find that M&As in periods of high valuation (wave mergers) lead to inferior long-term performance relative to periods of low valuation (non-wave mergers) and that short-term managerial tendencies and poor governance lead to further deterioration in performance.

Our results confirm the findings of Bouwman *et al.* (2007), that acquiring firms buying in high-valuation markets have lower abnormal stock returns and operating performance in the long run. As argued by Duchin and Schmidt (2008), agency problems, such as empire building, are more difficult to detect during periods of high valuation (merger waves) because of the difficulty in simultaneously following and analyzing numerous deals; thus, in-wave M&As are associated with poorer governance and inferior long-term performance.

4.4 Interpretations and contributions

Overall, the results in Tables II to VI provide consistent evidence on the agency problems associated with corporate acquisitions (Mann and Sicherman, 1991; Durnev *et al.*, 2004; Moeller *et al.*, 2005). Table II shows that M&A activities respond positively to changes in stock market valuation, with the effects of market valuation on M&As varying across different types of M&A and managerial characteristics. The two-stage

	Endogenous binary treatment: M&A decision	Number of observations
<i>Panel A. Predicting 1-year ahead growth in earnings (second stage regression)</i>		
Dependent variable: 1-year ahead growth in earnings		
Model (1) All firms		
<i>N</i>	-1.1768	1,331
Heteroskedastic-consistent <i>t</i> -ratio	-1.66*	
Model (2) CEO's tenure low		
<i>N</i>	-2.2907	459
Heteroskedastic-consistent <i>t</i> -ratio	-1.99**	
Model (3) CEO's tenure high		
<i>N</i>	-1.8808	335
Heteroskedastic-consistent <i>t</i> -ratio	-1.16	
Model (4) CEO equity (% of total shares): Low		
<i>N</i>	-1.8180	305
Heteroskedastic-consistent <i>t</i> -ratio	-1.66*	
Model (5) CEO equity (% of total shares): High		
<i>N</i>	1.1317	298
Heteroskedastic-consistent <i>t</i> -ratio	1.00	
Model (6) CEO in-the-money exercisable options (% of earnings): Low		
<i>N</i>	-0.4939	702
Heteroskedastic-consistent <i>t</i> -ratio	-0.37	
Model (7) CEO in-the-money exercisable options (% of earnings): High		
<i>N</i>	-2.7841	620
Heteroskedastic-consistent <i>t</i> -ratio	-2.49**	
<i>Panel A1. Predicting 1-year ahead growth in earnings (second stage regression)</i>		
Dependent variable: 1-year ahead growth in earnings		
Model (8) CEO as Board of Director: Yes		
<i>N</i>	-1.4741	1,182
Heteroskedastic-consistent <i>t</i> -ratio	-1.82**	
Model (9) CEO as Board of Director: No		
<i>N</i>	0.9779	149
Heteroskedastic-consistent <i>t</i> -ratio	0.33	
Model (10) CEO's long-term incentive: Yes		
<i>N</i>	0.8275	251
Heteroskedastic-consistent <i>t</i> -ratio	0.92	
Model (11) CEO's long-term incentive: No		
<i>N</i>	-1.7401	1,080
Heteroskedastic-consistent <i>t</i> -ratio	-1.70**	
Model (12) Number of Board of Directors meetings: Low		
<i>N</i>	-0.6496	773
Heteroskedastic-consistent <i>t</i> -ratio	-0.67	
Model (13) Number of Board of Directors meetings: High		
<i>N</i>	-0.5339	540
Heteroskedastic-consistent <i>t</i> -ratio	-1.24	
Model (14) CEO Total option grants (% of total compensation): Low		
<i>N</i>	8.2045	625
Heteroskedastic-consistent <i>t</i> -ratio	0.88	
		(continued)

Table VI. Stock market-driven acquisitions and firm performances – case for acquisitions in high valuation market

	Endogenous binary treatment: M&A decision	Number of observations
Model (15) CEO Total option grants (% of total compensation): High		
<i>N</i>	- 1.8608	694
Hetroskedastic-consistent <i>t</i> -ratio	- 2.08**	
<i>Panel B. Predicting 1-year ahead CARs (second stage regression)</i>		
Dependent variable: 1-year ahead CARs		
Model (1) All firms		
<i>N</i>	- 0.3318	1,272
Hetroskedastic-consistent <i>t</i> -ratio	- 1.54*	
Model (2) CEO's tenure low		
<i>N</i>	- 0.9254	444
Hetroskedastic-consistent <i>t</i> -ratio	- 2.29**	
Model (3) CEO's tenure high		
<i>N</i>	- 0.4553	313
Hetroskedastic-consistent <i>t</i> -ratio	- 1.13	
Model (4) CEO equity (% of total shares): Low		
<i>N</i>	- 0.1454	297
Hetroskedastic-consistent <i>t</i> -ratio	- 0.60	
Model (5) CEO Equity (% of total shares): High		
<i>N</i>	- 0.4456	273
Hetroskedastic-consistent <i>t</i> -ratio	- 1.19	
Model (6) CEO in-the-money exercisable options (% of earnings): Low		
<i>N</i>	0.0417	664
Hetroskedastic-consistent <i>t</i> -ratio	0.12	
Model (7) CEO in-the-money exercisable options (% of earnings): High		
<i>N</i>	- 0.9315	600
Hetroskedastic-consistent <i>t</i> -ratio	- 2.56**	
<i>Panel B1. Predicting 1-year ahead CARs (second stage regression)</i>		
Dependent variable: 1-year ahead CARs		
Model (8) CEO as Board of Director: Yes		
<i>N</i>	- 0.3322	1,129
Hetroskedastic-consistent <i>t</i> -ratio	- 1.55*	
Model (9) CEO as Board of Director: No		
<i>N</i>	- 0.1804	- 1.50
Hetroskedastic-consistent <i>t</i> -ratio	- 0.22	
Model (10) CEO's long-term incentive: Yes		
<i>N</i>	- 0.0625	250
Hetroskedastic-consistent <i>t</i> -ratio	- 0.24	
Model (11) CEO's long-term incentive: No		
<i>N</i>	- 0.5807	1,022
Hetroskedastic-consistent <i>t</i> -ratio	- 1.96**	
Model (12) Number of Board of Directors meetings: Low		
<i>N</i>	- 0.0812	747
Hetroskedastic-consistent <i>t</i> -ratio	- 0.30	
Model (13) Number of Board of Directors meetings: High		
<i>N</i>	26.19	509
Hetroskedastic-consistent <i>t</i> -ratio	- 1.00	
Model (14) CEO total option grants (% of total compensation): Low		
<i>N</i>	0.8598	597

Table VI.

(continued)

	Endogenous binary treatment: M&A decision	Number of observations
Hetroskedastic-consistent t -ratio	0.30	
Model (15) CEO Total option grants (% of total compensation): High		
N	-0.2978	664
Hetroskedastic-consistent t -ratio	-1.61*	

Notes: *, **, *** Significant at the 10, 5, and 1 percent level, respectively. This table reports the impacts of (stock market driven) stock-financed acquisitions in up market on firm operating and stock performances with different groups of firms with CEO characteristics. Up market is defined as the period where the investor sentiment index is above its median. The M&A decision is defined as: $I_{\{M\&A\text{Decision}\}it} = 1$ if firms with stock-financed acquisitions in up market and = 0, otherwise. The two-stage estimation procedure is summarized as follows. In the first-stage, stock-financed acquisition decision in up market (an endogenous binary treatment) is estimated as:

$$I_{\{M\&A\text{Decision}\}it} = a_0 + a_1 \text{Tobin's } Q_{it-1} = a_2 \text{ Momentum Returns}_{it-1} = a_3 \text{ Market Sentiment Index}_{t-1} = u_{it}$$

where the explanatory variables include different measures of stock market valuation: (i) Tobin's Q , computed as the market value of equity plus the book value of assets minus the book value of equity, scaled by book assets, (ii) momentum returns, defined as the stock returns over the previous 12 months, and (iii) the market sentiment index, as constructed by Baker and Wurgler (2002). In the second-stage, the impact of stock market-driven acquisition decision on firm future operating and stock performances is estimated as:

$$Y_{it+1} = b_0 + b_1 I_{\{M\&A\text{ Decision}\}it} + b_2 \text{Control}_{it-1} + e_{it}$$

where $e_{it} \sim N(0, s)$; $u_{it} \sim N(0, 1)$; $\text{corr}(e_{it}, u_{it}) = r$. In the second stage, future firm performance measures are regressed on endogenous covariate acquisition decisions $I_{\{M\&A\text{Decisions}\}it}$ and the control variables Control_{it-1} for firm characteristics. The control variables include: (i) new equity issues, calculated as prices multiplied by changes in share-outstanding, scaled by beginning-of-year market capitalization, (ii) new debt issues, defined as percentage changes in long-term debt, (iii) log of cash flows, (iv) the payout ratio (defined as dividend-to-earnings), (v) market risk (estimated from CAPM beta), (vi) firm-specific risk (estimated from CAPM residual variance), (vii) firm size (defined as log of market capitalization) and, (viii) firm age. Panel A reports the impacts of stock market valuation on acquisition decisions (coefficient of b_1 in the second-stage model) for firms grouped by: (i) CEO's tenure; (ii) CEO's equity ownership stake as percentage of total equity of the firm; (iii) stock options percentage of CEO's total compensations; (iv) firms grouped by the value of exercisable in-the-money stock options as percentage of earnings; (v) whether CEO serves as director; (vi) whether CEO has long-term incentive compensations; and (vii) the number of board of directors meetings. Panel B reports the impacts of stock market driven acquisitions on firms' future stock performances (1-year ahead CARs) for firms grouped by the same set of variables used in Panel A. The treatment effect model is estimated with two-step consistent estimates of the parameters, standard errors, and covariance matrix

Table VI.

treatment model indicates (from the first-stage results) that those M&As financed by stocks, paying high bid premiums, occurring during a market upturn, and with short-horizon managerial characteristics, are more sensitive to market valuation.

The value implications of market-driven M&As are presented in Tables III to VI. Our findings support the argument of Jensen (2005), showing that market-driven M&As have significantly negative impacts on the future operating and stock performance of firms. Most importantly, we provide fresh evidence on the ways in which stock market valuation and managerial incentives can jointly affect M&A decisions and post-M&A performance. The negative impacts are greater for firms where CEOs have shorter tenure, lower managerial equity stake, no long-term

incentive plans, greater options compensation and exercisable in-the-money options, and in those firms with more board meetings and where CEOs serve on the board of directors. These newly documented results suggest that market-driven M&As are more value destroying for those firms with poor governance and those with CEOs subject to misaligned incentives.

The negative impacts are also greater for stock-financed M&As, paying high bid premiums and occurring during an upturn in the market. In contrast, market-driven cash-financed M&As are not necessarily value destroying; indeed, we find significantly positive impacts on firm performance for cash-financed M&As where CEOs have lower options compensation[25]. Similarly, during periods of low market valuation, market-driven M&As have significantly positive impacts on the performance of firms with low options compensation.

We further examine the case of related *vis-à-vis* unrelated mergers (identified as whether acquirers and targets are operating in the same two-digit SIC codes or under the same Fama-French 12-industry classifications)[26]. We find that stock market-driven unrelated mergers have significantly negative impacts on future firm performance; in contrast, related mergers have no negative impacts. This finding of more negative announcement effects with regard to unrelated diversification is consistent with Morck *et al.* (1990). As noted above, unrelated diversification represents a type of merger for which there is a natural presumption of agency motivation, with managers seeking to build not only larger, but more stable empires.

5. Further evidence and robustness tests

5.1 Empire-building with market-driven M&As

There are various ways that managers can build empires so as to increase the size of their firm, and hence, their sphere of control; when managers have larger companies to manage, they are seen as having more power. Moreover, managers' empire building incentives can also be related to their compensation packages (such as bonuses), which are often tied to a larger firm size measured by its combined market value. Therefore, mergers and acquisitions are often considered a good candidate for rapidly and effectively increasing firm size. The size effect of M&As can be measured by changes in total assets; we therefore, take the change in total assets as an endogenous covariate, and examine the value implications of market-driven investment to investigate the relevant managerial incentives, such as empire building, behind such investment.

We estimate a two-stage panel regression model to study the impact of stock market-driven investment (with I_{it} as the endogenous covariate) on the future performance of firms. In the first stage, investment is predicted by market valuation variables (Valuation_{it})[27]. In the second stage, the future performance of firms (R_{it+1}) is estimated as a function of predicted investment (\hat{I}_{it}) and residual investment ($I_{it} - \hat{I}_{it}$) from the first-stage results, along with other control variables (Control_{it}), as follows[28]:

$$I_{it} = a + bI_{it-1} + c\text{Valuation}_{it-1} + e_{it} \quad (4)$$

$$R_{it+1} = \alpha + \lambda\hat{I}_{it} + \theta(I_{it} - \hat{I}_{it}) + \gamma\text{Control}_{it} + \varepsilon_{it} \quad (5)$$

Different exclusive restrictions tested in the two-stage model, as well as the use of a Balestra and Varadharajan-Krishnakumar G2SLS panel regression, with the inclusion

of within-firm (fixed) effects, also provides similar results and conclusions. Table VII reports the impact on firm performance from changes in total assets. Since changes in total assets (large changes in particular) include M&A and divesting activities, the results are useful in providing an understanding of the size effect of such activities.

Panels A and A.1 of Table VII suggest that market-driven investment has significantly negative impacts on the future operating performance of firms where CEOs have more options compensation and in-the-money exercisable options (Models 7 and 15) and no long-term incentive plans (Model 11), and where they serve as board directors (Model 8) and have more frequent board meetings (Model 13). Panels B and B.1 of Table VII suggest that market-driven investment has significantly negative impacts on the future stock performance of firms whose CEOs have more options compensation (Model 7) and no long-term incentive plans (Model 11).

The findings in this section support the conclusions of the previous section, which are that managers with short horizons tend to make value-destroying M&A decisions which correspond to market valuation. Our findings, as a whole, provide general support for the literature on empire building[29], whilst also suggesting that inappropriate incentive compensation and governance allow managers to pursue value-destroying acquisitions. Where managerial compensation is based on the acquisition of profits (for example, through stock options), with no emphasis on long-term incentives, this would provide managers with perverse incentives to acquire companies so as to increase the size of their firm, despite this ultimately leading to deterioration in shareholder value.

6. Conclusions

The stock market can serve as a double-edged sword in corporate M&As, since market mispricing could create opportunities for M&A projects which would not otherwise be financed (De Long *et al.*, 1989; Morck *et al.*, 1990; Stein, 1996), whilst it can also distort M&A decisions and present incentives for managerial self-interest (Jensen, 2005; Moeller *et al.*, 2006). As argued by Shleifer (2000), if market inefficiency affects corporate decisions, this gives rise to an important question as to whether this is good or bad for economic efficiency.

We believe that this study is amongst the first to examine the ways in which stock market valuation and managerial incentives can jointly affect M&A decisions and post-M&A performance, and argue that managerial incentives and corporate governance provide an opportunity to identify the separating equilibrium. Thus, by explicitly accounting for different managerial characteristics and M&A types, we provide new empirical evidence on the motivations behind, and the consequences of, stock market-driven M&As.

Consistent with Shleifer and Vishny (2003), who concluded that the stock market plays an influential role in corporate M&A decisions, we find that market valuation has a significant impact on the likelihood of M&As, the exchange medium selected and the level of the bid premiums. Firms with less managerial equity ownership, more executive stock options, no long-term incentive plans and CEOs serving as board directors are more likely to pursue value-destroying market-driven M&As.

Consistent with the agency (Jensen, 2005) and managerial myopia (Stein, 1989; Garvey *et al.*, 1999) hypotheses, we suggest that market-driven M&As undertaken by firms with poor governance, and CEOs subject to misaligned incentives, managerial

	Predicted change in total assets	F-test	Number of observations
<i>Panel A. Predicting 1-year ahead growth in earnings (second stage regression)</i>			
Dependent variable: 1-year ahead growth in earnings			
Model (1) All firms			
<i>N</i>	- 0.0137		511
Hetroskedastic-consistent <i>t</i> -ratio	- 1.71 *		
Model (2) CEO's tenure low			
<i>N</i>	- 0.0127		195
Hetroskedastic-consistent <i>t</i> -ratio	- 0.99		
Model (3) CEO's tenure high			
<i>N</i>	- 0.0176		142
Hetroskedastic-consistent <i>t</i> -ratio	- 1.16		
Model (4) CEO Equity (% of total shares): Low			
<i>N</i>	- 0.0107		131
Hetroskedastic-consistent <i>t</i> -ratio	- 0.72		
Model (5) CEO equity (% of total shares): High			
<i>N</i>	- 0.0076		105
Hetroskedastic-consistent <i>t</i> -ratio	- 0.42		
Model (6) CEO in-the-money exercisable options (% of earnings): Low			
<i>N</i>	0.0085		224
Hetroskedastic-consistent <i>t</i> -ratio	0.34		
Model (7) CEO in-the-money exercisable options (% of earnings): High			
<i>N</i>	- 0.0217		285
Hetroskedastic-consistent <i>t</i> -ratio	- 3.50 ***		
<i>Panel A1. Predicting 1-year ahead growth in earnings (second stage regression)</i>			
Dependent variable: 1-year ahead growth in earnings			
Model (8) CEO as Board of Director: Yes			
<i>N</i>	- 0.0153		468
Hetroskedastic-consistent <i>t</i> -ratio	- 1.91 *		
Model (9) CEO as Board of Director: No			
<i>N</i>	- 0.0189		43
Hetroskedastic-consistent <i>t</i> -ratio	- 0.47		
Model (10) CEO's long-term incentive: Yes			
<i>N</i>	- 0.0222		98
Hetroskedastic-consistent <i>t</i> -ratio	- 1.07		
Model (11) CEO's Long - term incentive: No			
<i>N</i>	- 0.0095		413
Hetroskedastic-consistent <i>t</i> -ratio	- 1.55 *		
Model (12) Number of Board of Directors meetings: Low			
<i>N</i>	0.0048		264
Hetroskedastic-consistent <i>t</i> -ratio	0.30		
Model (13) Number of Board of Directors meetings: High			
<i>N</i>	- 0.0246		237
Hetroskedastic-consistent <i>t</i> -ratio	- 1.85 *		
Model (14) CEO Total option grants (% of total compensation): Low			
<i>N</i>	- 0.0153		203
Hetroskedastic-consistent <i>t</i> -ratio	- 1.12		

Table VII.
Stock market-driven acquisitions (measured by change in total assets) and firm performances

(continued)

	Predicted change in total assets	F-test	Number of observations
Model (15) CEO total option grants (% of total compensation): High			
<i>N</i>	-0.0112		308
Heteroskedastic-consistent <i>t</i> -ratio	-1.62*		
<i>Panel B. Predicting 1-year ahead CARs (second stage regression)</i>			
Dependent variable: 1-year ahead CARs			
Model (1) All firms			
<i>N</i>	0.0015	1.14	453
Heteroskedastic-consistent <i>t</i> -ratio	0.54		
Model (2) CEO's tenure low			
<i>N</i>	-0.0016	0.26	173
Heteroskedastic-consistent <i>t</i> -ratio	-0.41		
Model (3) CEO's tenure high			
<i>N</i>	0.0024	0.18	119
Heteroskedastic-consistent <i>t</i> -ratio	0.37		
Model (4) CEO Equity (% of total shares): Low			
<i>N</i>	-0.0004	0.10	108
Heteroskedastic-consistent <i>t</i> -ratio	-0.08		
Model (5) CEO Equity (% of total shares): High			
<i>N</i>	0.0053	0.15	93
Heteroskedastic-consistent <i>t</i> -ratio	0.55		
Model (6) CEO in-the-money exercisable options (% of earnings): Low			
<i>N</i>	0.0052	0.72	205
Heteroskedastic-consistent <i>t</i> -ratio	0.86		
Model (7) CEO in-the-money exercisable options (% of earnings): High			
<i>N</i>	-0.0027	1.29	247
Heteroskedastic-consistent <i>t</i> -ratio	-1.80**		
<i>Panel B1. Predicting 1-year ahead CARs (second stage regression)</i>			
Dependent variable: 1-year ahead CARs			
Model (8) CEO as Board of Director: Yes			
<i>N</i>	0.0016	1.18	412
Heteroskedastic-consistent <i>t</i> -ratio	0.56		
Model (9) CEO as Board of Director: No			
<i>N</i>	-0.0230	1.59	41
Heteroskedastic-consistent <i>t</i> -ratio	-1.31		
Model (10) CEO's long-term incentive: Yes			
<i>N</i>	-0.0002	0.00	83
Heteroskedastic-consistent <i>t</i> -ratio	-0.04		
Model (11) CEO's long-term incentive: No			
<i>N</i>	-0.0019	1.59	370
Heteroskedastic-consistent <i>t</i> -ratio	-1.65*		
Model (12) Number of Board of Directors meetings: Low			
<i>N</i>	0.0094	2.22	239
Heteroskedastic-consistent <i>t</i> -ratio	2.09**		
Model (13) Number of Board of Directors meetings: High			
<i>N</i>	-0.0002	0.26	207
Heteroskedastic-consistent <i>t</i> -ratio	-0.06		

(continued)

Table VII.

	Predicted change in total assets	F-test	Number of observations
Model (14) CEO Total option grants (% of total compensation):			
Low			
<i>N</i>	0.0016	0.82	170
Hetroskedastic-consistent <i>t</i> -ratio	0.28		
Model (15) CEO total option grants (% of total compensation): High			
<i>N</i>	0.0010	0.05	283
Hetroskedastic-consistent <i>t</i> -ratio	0.32		

Notes: *, **, *** Significant at the 10, 5, and 1 percent level, respectively. This table reports the impacts of stock market driven acquisitions (measured by change in total assets) on firms' operating and stock performances with different groups of firms with CEO characteristics. Dependent variables are: one-year ahead percentage change in earnings, and one-year ahead Cumulative Abnormal Returns (CARs). The endogenous covariate is the percentage change in total assets. We estimate a two-stage panel regression model to study the impact of stock market driven acquisitions (as endogenous covariate) on firm future performances. In the first stage, investments are predicted by market valuation variables ($Valuation_{it-1}$). In the second stage, firm future performances (R_{it+1}) is estimated as a function of predicted investments (\hat{I}_{it}) from the first-stage regression, residual investments ($I_{it} - \hat{I}_{it}$) from the first-stage regression, market valuation variables ($Valuation_{it-1}$), and control variables ($Control_{it-1}$) as the following:

$$I_{it} = a + bI_{it-1} + cValuation_{it-1} + e_{it}$$

$$R_{it+1} = \alpha + \lambda I_{it} + \theta(I_{it} - \hat{I}_{it}) + \gamma Control_{it-1} + \varepsilon_{it}$$

Panel A reports the impacts of stock market driven acquisitions on firms' future operating performances (coefficient of b_1 in the second-stage model) for firms grouped by: (i) CEO's tenure; (ii) CEO's equity ownership stake as percentage of total equity of the firm; (iii) stock options percentage of CEO's total compensations; (iv) firms grouped by the value of exercisable in-the-money stock options as percentage of earnings; (v) whether CEO serves as director; (vi) whether CEO has long-term incentive compensations; and (vii) the number of board of directors meetings. Panel B reports the impacts of stock market driven acquisitions on firms' future stock performances (1-year ahead CARs) for firms grouped by the same set of variables used in Panel A. The results are obtained with robust cluster variance estimator – the Huber/White/sandwich estimator of robust variance estimates and clustered standard errors adjusted for cluster (within firm) correlation. For robustness check, we obtained similar results and same conclusion with estimates using panel regression with fixed-effect estimators

Table VII.

myopia, hubris and empire-building motives, will demonstrate inferior long-term performance. We conclude with the following suggestions for a better understanding of the behavioral motives and agency consequences of stock market-driven acquisitions.

In contrast to Murphy (2003), which suggests that options compensation provides a variety of benefits, this study demonstrates that stock options provide managers with inappropriate incentives, which can ultimately lead to such managers making perverse M&A decisions; thus, we suggest that options may not be an effective instrument for managerial compensation. As in Bergman and Jenter (2007), options compensation may also reflect the excessive optimism of firms, thereby providing further confirmation of the arguments on managerial myopia and hubris. The negative impact of market-driven M&As on the performance of acquiring firms is more significant for M&As which are financed by stocks, executed with high premiums and undertaken

during periods of high market valuation. Managerial overconfidence and hubris may affect these M&A characteristics whilst also undermining long-term performance.

Furthermore, misaligned managerial incentives and poor corporate governance can easily serve to amplify such value destruction. Short-horizon managers expropriate from stock market mispricing by making sub-optimal M&A decisions, whilst managers of overvalued firms use M&As to ease the fall in their overvalued stocks and push them back to efficient levels (Jensen, 2005). Finally, during periods of intense M&A activities where high M&A premiums are less scrutinized, managers make poor M&A decisions that do not add value to the firm, but, instead, enable managers to empire build thereby imposing agency costs to the firm.

Notes

1. Other explanations for merger waves are offered in the extant literature, such as the economic, technological or regulatory environment (Mitchell and Mulherin, 1996).
2. By examining the correlations between target and total gains, Berkovitch and Narayanan (1993) distinguished three motives for acquisitions: synergy, agency and hubris.
3. Malmendier and Tate (2005) also demonstrate that managerial overconfidence can account for general distortions in corporate investment.
4. Jensen (2005) argues that in order to meet unachievable expectations, managers will engage in risky actions, such as bad acquisitions that can destroy the core value of the firm, whilst also noting that the prevalence of equity-based managerial compensation, such as stock price appreciation-related bonus payments and option grants, serves only to make the situation worse.
5. See for example, Murphy (1999), Oyer (2004), Ross (2004), Dittmann and Ernst (2007) and Harford and Li (2007), amongst many others.
6. Short-horizon managers are more likely to engage in market-driven acquisitions, for both financing and agency considerations, using stock as the exchange medium. The financing consideration refers to the market timing in the issuing of equity when stocks are overpriced (Baker and Wurgler, 2002; Shleifer and Vishny, 2003). The agency consideration refers to managerial myopia, including managers catering to the market to stimulate short-run stock prices (Jensen, 2005; Polk and Sapienza, 2006), and empire building to expand the assets under their sphere of control (Duchin and Schmidt, 2008).
7. Examples include Jensen (1976, 1986, 2005), Stulz (1990), Zwiebel (1996) and Morellec (2004).
8. See, for example, De Long *et al.* (1989).
9. We estimate the two-stage panel regression model using the fixed-effect estimator. Hausman tests comparing fixed and random effects are employed throughout the paper to justify our use of the fixed-effect model.
10. We do, however, find that alternative measures of performance tested in the two-stage model with different exclusive restrictions lead to the same conclusions.
11. Examples include Murphy (1999), Almazan *et al.* (2005), and Brick *et al.* (2006).
12. Similar results are also obtained from our examination of the value of non-exercisable in-the-money options.
13. Our sample is quite comprehensive as it covers firms with sizes (market caps) ranging from 1.57 millions to 467 billions dollars. For firms that have M&As, their firm sizes range from 29.20 millions to 467 billions dollars; for firms that do not have M&As, their firm sizes range from 1.57 millions to 344 billions dollars.

14. We assign “1” to the dependent variable for any firm-year with a M&A deal in Model 1 (and “0” otherwise) whilst we only assign “1” to the dependent variable for firm-years with stock M&A deals (“0” for cash M&A and non-M&A firm-years) in Model 2. We use the same set of explanatory variables to estimate all three models.
15. The *t*-statistics are calculated using robust standard errors with firm-level clustering. Similar results and conclusions are obtained using a panel regression with fixed-effect estimators as a check for robustness.
16. Similar results are again obtained using the two-year ahead period for the future performance measure as an addition check for robustness.
17. Robustness checks using the treatment effect model with robust standard errors and firm-level clustering, and panel regression estimates with fixed-effect estimators, again provide similar results and conclusions.
18. Gompers (1996) argues along the same lines, that young venture capital firms are more likely than older venture firms to take distorting action to enhance their near-term performance.
19. The median number of board of directors meetings for our sample is six times per year.
20. These are referred to as “Stock M&As” throughout this section.
21. CEOs are found to be serving as board directors in 91.65 per cent of the observations in our sample (2,678 of 2,922), with similar percentages for both M&A and non-M&A firms. Where CEOs do serve on the board, there are also greater numbers of board meetings, particularly for M&A firms, implying that such excessively large number of board meetings may arise from disagreements between CEOs and other board members when firms experience major changes, such as M&As.
22. This is consistent with the line of reasoning pursued by Shleifer and Vishny (2003), Dong *et al.* (2006) and Ang and Cheng (2006).
23. Similar results are obtained for the bid premium computed from the preceding four-week average market price.
24. Similar results and same conclusion are obtained using alternative thresholds to define high bid premium.
25. For brevity, the results are not reported here; however, they are available on request from the authors.
26. Again, these results are also not reported here, but are available upon request.
27. Using the percentage change in book assets (which includes the effect of corporate acquisition activities) as the dependent variable in the same model shows that all three valuation measures (Tobin’s *Q*, the momentum returns and the market sentiment index) have significantly positive impacts on the percentage change in total assets (results not reported here).
28. We estimate the two-stage panel regression model using the fixed-effect estimator, employing Hausman comparisons of fixed and random effects throughout this paper to justify our use of the fixed-effect model.
29. Along the same lines as Jensen (1986), Stulz (1990), Hart and Moore (1995) and Zwiebel (1996).

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