Market Misvaluation, Managerial Horizon, and Acquisitions

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Abstract:

This paper analyzes the impact of managerial horizon on mergers and acquisitions. Managers with a long horizon emphasize firms' long-term value, whereas short-horizon executives are concerned about firms' value in the short run. When bidding firms' stocks are overpriced, long-horizon acquiring managers tend to acquire targets with equity to serve acquirers' long-term value. However, acquiring managers with a short horizon are inclined to pay for acquisitions with cash, in hope of hiding the sign of stock overvaluation. Moreover, short-horizon managers, relative to the long-horizon ones, are more likely to choose acquisition projects that the market wants to see, thus boosting the short-term stock price by catering to investor sentiment. The paper's main predication is that acquiring firms managed by short-horizon executives have higher abnormal returns at acquisition announcements, less likelihood of using equity to pay for the transactions, and worse post-merger stock performance in the long run. I construct two proxies for managerial horizon based on the CEO's career concern and compensation scheme, and provide strong empirical evidence supporting the above prediction.

Keywords: Acquisition, Merger, Managerial Horizon, Misvaluation

JEL Classification: G34, G38

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1. Introduction

Corporate acquisitions are one of the most important activities for the corporations. They involve large commitments of money and have profound impacts on both shareholders' and managers' welfare. Moreover, acquisition decisions are susceptible to the acute conflicts of interest among different groups of agents, including short-term shareholders, long-term shareholders, and managers. Although this topic has been extensively studied in existing research literature, it is not yet conclusive what explains the cross-sectional variations of the gains (losses) of bidding firms by making acquisitions, nor are the motivations behind these acquisition decisions.

The purpose of this paper is to analyze the motives and consequences of mergers and acquisitions from an angle of managerial horizon. In particular, I examine the effect of managerial horizon on a few takeover characteristics including acquirers' announcement returns, methods of payment in the transactions, long-term performance following the acquisitions as well as acquisition frequency. Managers of a long horizon place more emphasis on firms' long-term value than the short-term value. For this reason, they tend to make takeover decisions to increase firms' long-run stock price. In contrast, short-horizon managers stress firms' short-term performance and prefer acquisitions that can enhance firms' stock value in the short run. I test this hypothesis using two proxies for managerial horizon, and find supporting evidence.

Managerial horizon determines whether the managers are more concerned about the firm's short-run stock price or long-run price. It will significantly shape acquisition decisions

in a misvalued stock market, where the firm's current market value (short-run value) deviates from its fundamental value (long-run value). As shown by existing literature, long-horizon managers tend to exploit overvalued stock price by making equity transactions. In contrast, short-horizon executives tend to boost the near-term stock price by catering to the investor sentiments. Based on this theoretical background, I suggest two channels through which managerial horizon influences the M&A events.

The first channel is the equity-issuance channel, through which long-horizon managers use overpriced equity to acquire the target's asset. Shleifer and Vishny (2003) provide a model of market driven acquisitions, in which bidders use their overvalued equity as cheap currency to acquire less overvalued targets. These mergers benefit the bidders' long-run shareholders because they cushion the subsequent drop of the overvalued stock price. One of the key assumptions in the model is that the acquiring-firm managers act for the interests of the long-term shareholders (in other words, the managers have a long horizon). As an extension of their work, if managers have a short horizon they will demonstrate different managerial incentive to exploit market inefficiency. A short-horizon manager may avoid using equity to acquire if equity issuance knocks down short-term stock price by somewhat revealing the signs of overvaluation to the market.

The second one is the catering channel. Short-horizon managers may undertake acquisitions that the market wants to see, and enhance the firm's short-term stock price, even though these mergers may cost the shareholders in the long run. As suggested by Jensen (2005), short-horizon managers tend to make financing and investment decisions to cater to the market's preference. In face of investor sentiment, they are likely to follow this sentiment

and make risky negative net present value investments that the market thinks to be profitable. Jensen (2005) also points out that this catering behavior usually destroys real long-term value, even though it helps to boost stock price in the short term.

The paper's main prediction is that long-horizon acquiring managers (as opposed to short-horizon ones) experience lower abnormal returns around merger announcements, are more likely to use equity as the payment mode, and have better post-merger stock performance.

I test these predictions empirically using a U.S. acquisition sample of 2894 deals over the period from 1993 to 2004. The key explanatory variable is managerial horizon, which I propose two proxies to measure. The first measure is a dummy variable, indicating whether the CEO is near retirement. Career concern is a natural factor that is correlated with managerial horizon. A near-retirement CEO usually has little time to remain in office and therefore it is less likely for the CEO to benefit from the firm's long-term performance. Consistent this view, Dechow and Sloan (1991) find that CEOs who are near retirement tend to cut the firm's research and development (R&D) and advertising, in order to increase the near-term earnings. Gibbon and Murphy (1992) also argue that managers become more short-term oriented when they approach retirement.

My second proxy is the value of the CEO's restricted stock and options that just become vested during a given year as a percentage of the CEO's total pay. The idea behind this proxy is straightforward. An executive is usually holding a big amount of stock and options of her own company; these equity holdings are restricted from selling/exercising until they become vested. As under-diversified and risk-averse individuals, the managers are quite eager to

sell/exercise their vested stock and options (Hall and Murphy (2000) and (2002)). If a CEO has a sizeable amount of incentive portfolio turning to be vested, she will probably cash out these equity positions within a short period of time and will consequently be more concerned about the firm's short-run stock price. While the first proxy measures managerial horizon from the perspective of career concern, the second variable focuses on the executive compensation scheme.

The empirical result is consistent with the prediction that short-horizon managers are associated with higher announcement returns, smaller likelihood of using stock to pay the acquisition, and worse post-merger stock performance. For example, a near-retirement bidding CEO (short horizon) is associated with about 0.79 percentage points higher bidders' announcement return, 8 percentage points smaller likelihood of using stock to acquire, and 10 percentage points worse performance during the three years after the acquisitions.

I also examine the relation between managerial horizon and acquisition frequency. The results show that managerial horizon significantly influences the corporate decision whether to undertake an acquisition. In particular, long-horizon CEOs tend to make more acquisitions than the short-horizon ones do, and this relation becomes stronger when the acquirer's market valuation is high.

This paper makes a few contributions to the existing literature. First of all, my study contributes to the literature on corporate acquisition decisions by identifying managerial horizon as an important factor, and provides new insights to understand the causes and effects of takeovers. Further, this article suggests that career concern and compensation scheme are two determinants for managerial horizon. To the best of my knowledge, this is the first paper

providing an empirical measure of managerial horizon. Moreover, my paper adds to the stream of understanding corporate behaviors from the perspective of managerial characteristics (e.g., Bertrand and Schoar (2003) and Malmendier and Tate (2007)). Finally, this study also contributes to the rapidly growing field of behavioral corporate finance, which sees corporate policies as a response to market mispricing (see Baker et al. (2006) for a comprehensive survey).

The article proceeds as follows. I develop my hypothesis in Section 2. Section 3 describes the proxies for managerial horizon. In Section 4, I describe the data and sample construction. Section 5 reports the empirical results. Finally, Section 6 concludes.

2. Main Hypothesis and Testable Implications

As discussed in the introduction, my study is closely related to the literature on managerial horizon, acquisitions and market misvaluation. Current literature suggests that managerial horizon influences acquisitions through two channels: equity issuance channel and catering channel. Under the equity issuance channel, long-horizon acquiring managers respond to firm overvaluation by using equity to acquire real assets from the targets, thereby benefiting bidders' long-term shareholders. In contrast, the catering channel refers to the practice that bidding managers of a short horizon make acquisitions to stimulate or cater to optimistic market expectation. My main hypothesis is that long-horizon bidding managers undertake acquisitions through the equity issuance channel while the short-horizon ones go through the catering channel.

2.1 Equity Issuance Channel

Shleifer and Vishny (2003), Rhodes-Kropf et al. (2005), and Dong et al. (2006) suggest that stock market misvaluation is a significant driving force for merger activities. They provide evidence that overvalued stock market stimulates managers to undertake more acquisitions, especially stock-financed acquisitions. They show that managers tend to use their overpriced equity to acquire assets from targets to serve the interests of long-term shareholders of bidders. One of the key assumptions in the above studies is that the managers have a long horizon. In the other words, those bidding managers emphasize the firm's long-run value more than the short-run value.

Managerial horizon plays an important role in whether the companies take advantage of their overvalued equity. Stein (1996) shows that the impacts of market inefficiency on financing and investment decisions depend on whether the managers have a long or short horizon. When the stock market can only partially correct the overvaluation at the news of an equity issuance, stock-financed acquisitions benefits bidders' shareholders in the long run but harms those shareholders in the short run. The decrease of the short-term stock price is mainly due to the price-pressure-related losses associated with an equity transaction. Stein (1996) interprets this price pressure as investors updating their beliefs somewhat when they see managers undertaking an equity transaction. Therefore, short-horizon managers, who are concerned about the firm's short-term stock price, are less likely to use equity to acquire, so that they can preserve the overvaluation in the short term.

2.2 Catering Channel

Market inefficiency can be exploited not only by issuing overvalued equity, but also by making investment to cater to investor sentiment. Managers with a short horizon may make an acquisition that has a negative NPV (and avoid an acquisition that has a positive NPV) as long as this strategy increases stock price in the short run. Consistent with the above view, Polk and Sapienza (2008) show that short-horizon managers tend to make investment that can boost short-term stock price by stimulating or cater to market optimism.

Although telling the market what it wants to hear may boost the near-term stock price, it costs the shareholders in the long term. As stated by Stein (1996), this catering behavior temporarily distorts the firm's financing and investment decisions and therefore misallocates resources. Consistent with Stein (1996), Polk and Sapienza (2008) find that companies that make investment to cater have low subsequent stock return. Brandenburger and Polak (1996) also suggest that concern for short-term stock price may lead managers to make decisions other than those suggested by their own superior information. Jensen (2005) particularly addresses the cost of catering in the acquisition market. He points out that when short-horizon managers choose the acquisition projects that cater to the investors' belief, the value of the core business is usually comprised. In this case, shareholders in the long run will be worse off, even though the short-term stock price is boosted.

2.3 Testable Predictions

Based on the analysis above, I have three testable implications.

Implication 1. *The acquirers managed by short-horizon CEOs experience higher stock returns at acquisition announcements than the acquirers managed by long-horizon CEOs do.*

Implication 2. *The acquirers managed by short-horizon CEOs are less likely to make equity-financed acquisitions than the acquirers managed by long-horizon CEOs do.*

Implication 3*. The acquirers managed by short-horizon CEOs experience lower long-run stock performance following the acquisitions than the acquirers managed by long-horizon CEOs do.*

3. Proxy for Managerial Horizon

Managerial horizon, like many other managerial characteristics, is naturally hard to observe. The first proxy is a dummy variable indicating whether the CEO is about to retire. This measure is fairly intuitive since a near-retirement CEO *on average* has a short horizon. Similar to Gibbons and Murphy (1992), I define *MH1* as a dummy which takes the value of one if the CEO is less than 62 years old, and zero otherwise. In other words, *MH1* equals one if the CEO is beyond three years of reaching age 65 or older than age 65, which implies a long horizon. Supporting this idea, Dechow and Sloan (1991) find that near-retirement CEOs have a short horizon and they are likely to reduce discretionary expenditures, like R&D and advertising, to boost accounting earnings and bonuses. Gibbon and Murphy (1992) make a similar point that retiring CEOs are usually more short-term oriented because of the diminishing career concern.

However, simply treating near-retirement CEOs as short-horizon ones might be problematic, since several forces could push in the opposite direction. First of all, those CEOs who survive in their positions for a long time are likely to be quite successful. These managers as a group may have a longer horizon than the young managers, because taking actions that maximize long-run value should lead to greater long-term success. To address this concern, I add CEO tenure as one independent variable in the regression analysis to control for the CEO's past working experience. Second, a founder CEO may have a long horizon even when she is retiring. Addressing this problem, I construct a dummy variable indicating whether the CEO is the founder of the company, and use this dummy as a control in the regressions.

Moreover, CEOs in smaller and younger firms and CEOs with lower compensation tend to be more ambitious. They may hope to achieve short-run success so that they can be rewarded with a more lucrative position in a larger company. Responding to this possibility, I control for firm size, firm age and CEO compensation level. Finally, Graham and Narasimhan (2004) and Malmendier and Nagel (2007) have found that CEOs from the Great Depression cohort tend to be more conservative in assessing external markets. The interpretation of this result is that early macroeconomic experience influences individuals' economic decisions even much later in life. To separate the effect of my horizon proxy from the effect of the Great Depression, I include in regressions a dummy indicating whether the CEO is from that cohort.

My second proxy for managerial horizon is the value of the CEO's restricted stock and options that just turn vested during a given year normalized by the CEO's total pay. The idea behind this proxy is straightforward. Stock and options are the majority part of a CEO's

compensation. Newly-granted stock and options are always restricted from selling or exercising until they become vested. If the CEO has little vested equity portfolio at hand, she may not be very concerned about the firm's near-term stock price because it does not have much direct impact on the CEO's personal wealth. In contrast, if a sizeable amount of the CEO's incentive portfolio becomes vested, she may be more concerned about the current stock price simply because a high short-term price increases the CEO's proceeds when she cashes out. This idea is true especially when managers are under-diversified and risk-averse. Hall and Murphy (2000) and (2002) argue that the managers, who are risk-averse individuals holding lots of their own firms' equity, are quite eager to sell/exercise their vested stock and options. Malmendier and Tate (2005) also suggest that those managers should minimize their vested equity holding in order to divest themselves of idiosyncratic risk. If a CEO has a big amount of stock and options that just become vested, she will probably cash out these equity within a short period of time and will consequently be more concerned about the firm's short-run stock price.

4. Sample Selection and Data Description

The sample of acquisitions comes from the Securities Data Company's (SDC) U.S. Mergers and Acquisitions Database. I begin with all completed US mergers and acquisitions announced between January 1, 1993 and December 31, 2004. I require that the deal value is equal to or greater than $10 million and that the acquirer controls more than 50% of the shares of the target firm after the acquisition. Deal value is defined by SDC as the total value of consideration paid by the acquiring firm, excluding fees and expenses. I also require that

bidders have available stock price from the Center for Research in Security Prices (CRSP), accounting information from Compustat, and CEO compensation and age data from Standard and Poor's ExecuComp.

If acquisitions have any significant impact on shareholders' and managers' wealth, the likelihood of capturing this effect will be greater when the firms make large acquisitions. For this reason, I eliminate those in which the deal value relative to the total asset (market value) of the bidder is less than 1%. The total asset is measured at the fiscal yearend prior to the announcement. After the relative size requirement, I finally end up with a sample of 2894 deals.

My first proxy for managerial horizon, *MH1*, equals one if the CEO is less than 62 years old, and zero otherwise. A CEO with *MH1*=1 is supposed to have a longer horizon than the CEO with *MH1*=0. In my sample, 481 deals are made by bidding CEOs who are near retirement (age 62 or older).

To construct my second horizon proxy *MH2*, I first compute an executive's total compensation (*Totalpay*) in a given year as the sum of the executive's salary, bonuses, long-term incentive plans, the grant-date value of restricted stock awards and the Black-Scholes value of granted options. I then calculate *Value_VestingEquity(t)*, the value of restricted stock and options that turn to be vested in Year *t*, as *Value_VestingEquity(t)* = *Unvested_Equity(t-1)+EquityGrant(t)–Unvested_Equity(t)*. The variables *Unvested_Equity(t)* and *Unvested_Equity(t-1)* are the value of unvested stock and options in Year *t* and *t-1*, respectively; *EquityGrant(t)* is the value of newly-granted stock and options in Year *t*. I then define *VestingEquity* as dividing *Value_VestingEquity* by *Totalpay*. The information on the

CEO's total pay, unvested equity portfolio and newly-granted stock and options is obtained from ExecuComp. Clearly, the variable *VestingEquity* captures the value of the just-turn-vested stock and options as the proportion of the CEO's total pay. Finally, I compute *MH2* as *MH2*=1–*VestingEquity*. The negative sign in front of *VestingEquity* indicates the idea that a CEO with a bigger *VestingEquity* has a relatively shorter horizon. A CEO with a higher *MH2* value is supposed to have a longer horizon.

The dummy *Founder* takes the value of one if the CEO is one of the firm's founders, and zero otherwise. Since ExecuComp does not provide information on whether the CEO is a founder, I follow the way of Adam et al. (2005) to construct it. In particular, the *Founder* dummy is set to be zero if the firm was incorporated 64 years or more prior to the current year or if the CEO joined the company at least four years after the firm's incorporation. Cleary, the current CEO cannot be the founder in the above two cases. For the remaining firm-year observations, I check the information about the firm's founder from various sources, including proxy statement, annual report and the internet. In my sample, 590 deals are made by founder CEOs of bidders.

Indicating whether the CEO is from the Great Depression cohort, I construct the *Depression* dummy, which equals one if the CEO is born during 1930s or earlier, and zero otherwise. In my sample, those CEOs from the Great Depression cohort undertake 171 acquisitions.

The bidders' accounting data are constructed from Compustat. Firm size is computed as the natural logarithm of firms' sales. Return on asset (*ROA*) is measured as the ratio of operation income before depreciation over total asset. I compute *Leverage* as the ratio of

long-term debt and current debt over total asset. The market value of total asset is computed as the book value of total asset plus market value of equity less the book value of equity. All of the variables are measured at the fiscal yearend prior to the acquisition announcements. The variable *PastReturn* denotes the compound stock return of acquiring firms over the year prior to acquisition announcements. The variable, *FirmAge*, measures the age of the company since it is listed in Compustat. To ensure that some outliers in the data are not driving my results, I winsorize all the continuous variables at one percentage tails.

[Insert Table 1 Here]

Table 1 presents descriptive statistic of my sample of 2894 completed acquisitions. Panel A reveals that acquisitions tend to be cyclical as both the total number and median deal value of mergers closely follow the business cycle expansion over the late 1990s. The evidence suggests significant time series clustering of acquisition activities, especially the clustering of stock-financed mergers. The number of stock-financed acquisitions declines sharply in the early 2000s, which coincides with the decline of overall stock market.

Panel B reports the characteristics of acquiring firms at the fiscal yearend prior to the announcements. The median bidder is quite large; its annual sale volume is $919 million. Bidding firms are performing well with median market-to-book ratio (M/B) of 2.5, past-year stock return of 21.6%, and ROA of 14%. The median *FirmAge* is about 14 years.

The median CEO is 54 years old; her tenure is six years. The median CEO is holding a *VestingEquity* of 0.23, implying that the value of stock and options that just become vested is about 23% of her total annual pay. The median CEO is receiving a total annual compensation of $2,278 thousand.

Following standard event study methods, I estimate the three-day accumulative abnormal returns (*CAR3*) over the event windows (-1, 1) around the announcement date (day 0) based on the market model using CRSP value-weighted index returns. The parameters are estimated within (-200, -60) event window relative to the announcement date. The *CAR3* of the bidder is slightly positive, with a mean of 0.3% and a median of 0.2%.

Following Barber and Lyon (1997) and Barber et al. (1999), I use control firms on size, book-to-market ratio, and prior-year stock return as the benchmark for post-merger stock performance. Barber and Lyon (1997) report that the control firm approach eliminates the skewness bias associated with the long-term buy-and-hold abnormal returns and yields well-specified statistics. Using Barber et al. (1999)'s method, I sort the population of NYSE/NASDAQ/AMEX firms into 14 size groups and 10 book-to-market groups. After determining which of the 140 groups the bidding firm is in at the month-end prior to the completion date of the acquisition, we choose from the group the control firm that is the closest match on prior-year stock return and is not involved in any acquisition events. Then, three-year buy-and-hold returns (starting from the month after the acquisition completion) are computed for the sample firms and control firms. At last, the three-year buy-and-hold abnormal returns are the difference between sample firm returns and corresponding contemporaneous returns of control firms (*BHAR3*). The bidder *BHAR3* over three years following the acquisition has a mean of –6.3% and a median of –6.5%, suggesting that the acquirer underperforms its control by a considerable magnitude.

[Insert Table 2 Here]

Table 2 reports my univariate comparison of merger performance sorted by managerial

horizon; it shows that long-horizon bidding CEOs have lower announcement returns but better post-merger long-run performance. In Panel A, I sort the sample by *MH1*. The average *CAR3* in the subsample with *MH1*=1 (long horizon) is about 0.1%; this number is significantly less than 0.9%, the average *CAR3* in the subsample with *MH1*=0 (short horizon). The comparison of medians gives the same result. The difference in median *CAR3* between long-horizon bidders and short-horizon ones is about -0.5% and this difference is statistically significant at the 1% level. The mean *BHAR3* when *MH1*=1 is -5%, about six percentage points bigger than the value when *MH1*=0; the difference is significant at the 10% level. The comparison of *BHAR3* in medians provides similar but less significant result. In Panel B of Table 2, the acquisition sample is sorted into quintiles based on *MH2*, where a bigger value in *MH2* indicates a longer horizon.

Panel B reports the means and medians of *CAR3* and *BHAR3* for the largest and smallest quintiles. Although the difference in *CAR3* is not statistically significant, the mean *BHAR3* in the biggest quintile is about 12.7 percentage points higher than that in the smallest quintile. The insignificance of the mean test in *CAR3* also suggests that it is important to control for some confounding variables in the regression analysis. Overall, the univariate test provides supportive evidence that long-horizon bidders experience worse performance in the short run but better outcome in the long run, than short-horizon bidders do.

5. Empirical Results

In this section, I describe the empirical specifications for testing my predictions and report the results.

5.1 Abnormal Returns during Announcement Periods

I run several cross-sectional OLS regressions in the following model:

$$\begin{aligned} CAR3 = {} & \delta_0 + \delta_1 MH1 + \delta_2 MH2 + \delta_3 PastrReturn + \delta_4 M/B + \delta_5 ROA \\ & + \delta_6 Firmsize + \delta_7 Leverage + \delta_8 Tender + \delta_9 Depression + \delta_{10} Founder \\ & + \delta_{11} Ln(Totalpay) + \delta_{12} Firmage + \delta_{13} Tenure + YearDummies \\ & + IndustryDummies + \varepsilon \end{aligned} \quad (1)$$

where the dependent variable is *CAR3* (in percentage), the bidder's three-day announcement abnormal returns. *Tender* is a dummy variable that equals one if the acquisition is a tender offer, and zero otherwise. Year dummies are employed to account for economy-wide shocks. Industry dummies based on the 48-industry classification of Fama and French (1997) are employed to control industry effects. According to Implication 1, I expect both δ_1 and δ_2 to be negative. Throughout my empirical test, p-values are computed based on Huber-White robust standard errors.

[Insert Table 3 Here]

The primary result from Table 3 is that the coefficients on *MH1* and *MH2* are negative and significant in all of the six models. The economic implication of the results is also remarkable. Taking Model 3 for instance, *MH1* has a significant coefficient of -0.79, which implies that the *CAR3* is decreased by 0.79 percentage points when *MH1* changes from zero to one. Taking Model 6 for another example, the coefficient on *MH2* is -0.11 and significant, indicating that an increase in *MH2* by one standard deviation (2.21) is expected to decrease *CAR3* by 0.24 percentage points, compared to an unconditional average of 0.3%.

The statistical and economic significance of the coefficients of both *MH1* and *MH2* is quite persistent across all of the six regressions. In Regression (1), I include *MH1* as well as

year and industries dummies as the independent variables. The coefficient on *MH1* is –0.71 with the p-value of 0.019. In Regression (2), I include *PastReturn, M/B, ROA, FirmSize, Leverage* and *Tender* as additional control variables. The coefficient of *MH1* is -0.71 with a p-value of 0.017. The regression also indicates that announcement returns tend to be higher if acquirers experience good past-year stock return, if acquirers have low M/B ratio, if acquirers have good accounting performance, and if acquirers are small companies.

In Regression (3), I add in *Depression, Founder, Ln(TotalPay), FirmAge* and *Tenure* as additional controls. The coefficient on *MH1* is -0.79 and it is significant at the 5% level. Notably, *Founder* has a significantly negative coefficient, indicating that bidding firms managed by founding CEOs experience lower announcement returns.

In Regressions (4)-(6), I substitute *MH1* with *MH2* to test Implication 1 under this alternative proxy for managerial horizon. The coefficients on *MH2* are -0.05, -0.11, and -0.11, respectively, and all of them are significant at the 10% level, indicating that managerial horizon measured by *MH2* is also negatively associated with bidders' announcement returns.

Overall, my findings support the prediction that acquiring firms managed by short-horizon CEOs experience higher abnormal returns at merger announcements.

5.2 Probability of Equity Payment

I use logit regressions to test whether long-horizon CEOs are more likely to pay with equity for acquisitions. Specifically, I estimate the following model:

$$\begin{aligned}\Pr(Allstock) = F(&MH1, MH2, PastReturn, M/B, ROA, FirmSize, Leverage,\\ &Tender, Depression, Founder, Ln(TotalPay), FirmAge, Tenure, YearDummies,\\ &IndustryDummies)\end{aligned} \quad (2)$$

The dependent variable, *Allstock*, takes a value of one if the acquisition is paid only by equity and zero otherwise. The variable *F* denotes the logit cumulative distribution function. Based on Implication 2, the coefficients on both *MH1* and *MH2* are expected to be positive.

[Insert Table 4 Here]

The regression results are reported in Table 4, where the coefficients are estimates of the marginal effect on the probability when all of the other independent variables are at their mean value. Table 4 indicates that the probability of equity payment increases with managerial horizon. In all of the six models, the coefficients on *MH1* and *MH2* are positive and significant, and their economic magnitude is also quite sizeable.

In Models (1)-(3), I use *MH1* and some control variables. The coefficient on *MH1* is 0.08 and it is significant at the 1% level in Model (1), where the control variables just include year dummies and industry dummies. This result implies that an increase of *MH1* from zero to one will increase the probability of equity payment by about 8 percentage points. Given the fact that the unconditional probability of an acquisition in my sample being financed all by equity is 24.5% (see Table 1), this marginal effect is definitely remarkable. In Model (2), I include *PastReturn*, *M/B*, *ROA*, *FirmSize*, *Leverage*, *Cash*, and *Tender* as additional explanatory variables. The variable *MH1* has a coefficient of 0.067 which is significant at the 1% level. I further add in *Depression*, *Founder, Ln(Totalpay)*, *FirmAge* and *Tenure* in Model (3), in which *MH1* attracts a significant coefficient of 0.063.

In Models (4)-(6), I use *MH2* instead of *MH1* in the regression analysis; the results are similar to that in the previous three models. Taking Model (4) for example, the coefficient on *MH2* is 0.008 and the p-value is 0.042, indicating that an increase in *MH2* from the mean by

one standard deviation is expected to increase the probability of equity payment by about 1.8 percentage points.

Of the other control variables, *M/B* ratio and *Founder* dummy are consistently positive and significant across all of the models, in which they are included. This fact suggests that bidders are more likely to use equity as the exchange medium when their stock valuation is high and when the CEO is the firm's founder. My result also indicates that an acquisition is less likely to be paid by equity if the bidder has good accounting performance, if the bidder takes high financial leverage, and if the deal is a tender offer.[1]

The results from Table 4 support the prediction that a long-horizon acquiring CEO is more likely to use equity as the exchange medium than a short-horizon one.

5.3 Long-term Stock Performance Following Acquisitions

I run cross-sectional OLS regressions to test whether the long-horizon CEOs have better long-term stock performance following acquisitions. The following model is estimated:

$$\begin{aligned} BHAR3 &= \alpha_0 + \alpha_1 MH1 + \alpha_2 MH2 + \alpha_3 PastReturn + \alpha_4 M/B + \alpha_5 ROA \\ &+ \alpha_6 FirmSize + \alpha_7 Leverage + \alpha_8 Tender + \alpha_9 Depression + \alpha_{10} Founder \\ &+ \alpha_{11} Ln(TotalPay) + \alpha_{12} FirmAge + \alpha_{13} Tenure + YearDummies + IndustryDummies + \varepsilon \end{aligned} \quad (3)$$

The dependent variable is buy-and-hold abnormal returns (in percentage) over three years after the deal completion, as defined in Section 4. Based on Implication 3, I expect both α_1 and α_2 to be positive.

[Insert Table 5 Here]

As shown in Table 5, the coefficients of *MH1* and *MH2* are significant and positive in all

[1] I also make a subsample where acquisitions with mixed payments are excluded, and do over the logit regressions in Table 4. The results almost remain the same.

of the regression models. The coefficients on *MH1* are around 10, implying that an increase in *MH1* from zero to one is expected to enhance *BHAR3* by around 10 percentage points, which is certainly economically important relative to the unconditional average of –6.3%. The coefficients on *MH2* are about 3, which indicates that *BHAR3* will increase by about 6.6 percentage points when *MH2* increases by one standard deviation.

The coefficients on *ROA* are consistently positive and significant at the 5% level, suggesting that bidders' prior-year accounting performance is positively associated with their long-run stock performance. *M/B* has significantly negative coefficients, which is consistent with previous literature that glamour acquirers perform poorly after the transactions (Rau and Vermaelen (1998)). All of the other control variables are generally insignificant. The major conclusion from the regression analysis is that managerial horizon emerges as an important and robust determinant of long-term stock performance after the merger.

The results support the prediction that a long-horizon acquiring CEO has better long-run performance following acquisitions, than a short-horizon one.

5.4 Additional Analysis on Acquisition Frequency

All of the above analysis relates to the value implications or financing choices conditional on making a merger deal. It is interesting to investigate the effect of managerial horizon on whether to make an acquisition at all. A manager with a short horizon might refrain from making risky projects like undertaking acquisitions. On the other hand, a manager with a long horizon is more likely to undertake mergers when her firm is overvalued. In this section, I examine how managerial horizon influences the manager's decision to make

acquisitions by estimating the following equation.

$$AcquisitionNumber_{it} = \beta_0 + \beta_1 MH1_{it-1} + \beta_2 MH2_{it-1} + \beta_3 MH1_{it-1} \times M/B_{it-1} + \beta_4 MH2_{it-1} \times M/B_{it-1} + \beta_5 M/B_{it-1} + \beta_6 PastReturn_{it-1} + \beta_7 ROA_{it-1} + \beta_8 FirmSize_{it-1} + YearDummies + IndustryDummies + \varepsilon_{it} \quad (4)$$

where *i* indexes firms and *t* indexes years. The dependent variable, *AcquisitionNumber*, is the number of acquisitions made by a company in a certain year. The independent variables include managerial horizon proxies, *M/B* ratio, the interaction between managerial horizon and *M/B* ratio, and other controls. The *M/B* variable measures the firm's market valuation. The regression is based on the ExecuComp population firms from 1993 to 2004.

[Insert Table 6 Here]

As shown in Table 6, long-horizon managers tend to make more acquisitions than the short-horizon ones, and this relation is stronger when the firm experiences high market valuation. In Model (1), I regress the acquisition number on *MH1*, *M/B*, *PastReturn*, *ROA*, *FirmSize*, and industry and year dummies. The coefficient on *MH1* is around 0.05 and is significant at the 1% level. This result implies that a manager with a long horizon makes more acquisitions. In Model (2), I add the interaction between *MH1* and *M/B*, *MH1*×*M/B*. This interaction term has a positive but insignificant coefficient of 0.005. I replace *MH1* with *MH2* in Models (3) and (4) to further examine the relation between managerial horizon and the acquisition frequency. The term, *MH2*×*M/B*, has a positive coefficient which is significant at the 1% level. This result implies that long-horizon managers are more likely to undertake acquisitions when the market valuation is high.

Overall, the results in Table 6 support, at least weakly, the view that managers with a long horizon make more acquisitions than short-horizon managers and that long-horizon

managers are more likely to take the chance of high market valuation to undertake acquisitions.

6. Conclusions

The major goal of this paper is to establish the relationship between managerial horizon and corporate takeover decisions. The paper analyzes how managers with different horizons make acquisitions as a response to the market inefficiency. Long-horizon managers (1) emphasize more on firms' long-term value, and (2) tend to use their overvalued equity to acquire target firms in order to preserve some of the temporary overvaluation for long-run shareholders. In contrast, short-horizon managers (1) have greater concerns on firms' short-term value, (2) prefer using cash to pay for the mergers for the purpose of hiding the information about firms' overvaluation and (3) tend to cater to the investor sentiment by completing the acquisitions that the market is currently optimistic about, even at the expense the firms' long-run value.

Specifically, I test the predictions that the acquiring firms controlled by long-horizon managers have lower abnormal returns around announcements, higher likelihood of using equity as the payment mode, and better post-merger stock performance, than the bidders controlled by short-horizon managers.

Two proxies are used to measure managerial horizon from the perspectives of managerial career concern and executive compensation. I argue that retirement and vested equity portfolio are two important factors for causing a short horizon. A near-retirement CEO *on average* has a shorter horizon than other CEOs. Also, when the CEO has lots of incentive

portfolio becoming vested, she will be more concerned about the short-term stock price and will have a relatively short horizon. The empirical evidence supports all of the above predictions.

This article is intended as a first systematic examination on the influences of managerial horizon on merger activities. It raises many interesting questions for future research as well. It is unexplored how managerial horizon affects the corporate policies such as debt and equity issuance, share repurchase, dividend, and investment. A good deal of empirical evidence supports the view that managers make the above policies to exploit market misvaluation. It will not be a surprise to expect a significant relation between managerial horizon and the above corporate decisions besides takeovers.

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Table 1: Summary Statistics of Corporate Acquisitions

Panel A: Distribution of Mergers and Acquisitions by Announcement Year

The sample includes 2894 completed US acquisitions from January 1, 1993 to December 31, 2004 as listed by SDC, where the acquiring firm gains control of the target firm whose deal value is at least $10 million and 1% of the bidder's total asset (market value). Deal value is defined by SDC as the total value of consideration paid by the acquiring firm, excluding fees and expenses. The bidder has stock price data in CRSP, accounting data in Compustat, and CEO compensation and age data in ExecuComp. Stock (Cash) refers to the deals where the payments to the targets are all by stock (cash). Mixed refers the deals, in which both cash and stock are used in the transactions.

Year	Number of Acquisitions (%)	Median Deal Value ($ Millions)	Method of Payment		
			Stock	Cash	Mixed
1993	23 (0.8)	43	8	5	10
1994	167 (5.8)	128	44	54	69
1995	252 (8.7)	92	95	61	96
1996	271 (9.4)	122	74	69	128
1997	316 (11)	196	100	68	148
1998	310 (10.7)	201	100	61	149
1999	337 (11.6)	241	100	69	168
2000	296 (10.2)	240	91	49	156
2001	232 (8)	120	38	57	137
2002	238 (8.2)	93	22	87	129
2003	224 (7.7)	121	18	88	118
2004	228 (7.9)	129	20	91	117
Total	2894 (100)	142	710	759	1425

Table 1, continued

Panel B: Acquiring Firm Characteristics

The sample includes 2894 completed US acquisitions from January 1, 1993 to December 31, 2004. VestingEquity is the value of the CEO's restricted stock and option holding that becomes vested in a given year normalized by the CEO's total annual pay. Totalpay ($K) is the CEO's total annual compensation. Tenure is the number of years that the CEO has served in her position. Sales ($million) refers to the firm's annual sales volume. M/B is the ratio of market value of equity over book value of equity. ROA is the accounting return on assets, obtained as the ratio of earning before interest and taxes to total asset. Leverage is the ratio of total debt over total asset. FirmAge refers to the age of the company. PastReturn denotes the compound stock return of acquiring firms over the year prior to acquisition announcements. All the above variables are measured at the fiscal year end prior to the acquisition announcement. CAR3 is the three-day accumulative abnormal returns over the event windows (-1, 1) around the announcement date (day 0) based on the market model using CRSP value-weighted index returns. The parameters are estimated within (-200, -60) event window relative to the announcement date. BHAR3 is the three-year buy-and-hold abnormal returns following the acquisition. Matching firms are formed based on size, book-to-market ratio and stock return.

Year	Mean	Std	5^{th} Pct	Median	95^{th} Pct
CEO Age	54.3	7.3	42	54	67
VestingEquity	0.19	2.21	0	0.23	2.72
TotalPay ($K)	4748	7378	444	2278	17661
Tenure	7.6	6.8	1	6	21
Sales	3005	5783	104	919	13544
M/B	3.9	5.1	0.9	2.5	11.7
ROA	14%	9%	2%	14%	29%
Leverage	22%	17%	0	21%	53%
FirmAge	17.9	13.3	2	14	46
PastReturn	34.9%	71.7%	-42.7%	21.6%	157.9%
CAR3	0.3%	6%	-9.9%	0.2%	10.2%
BHAR3	-6.3 %	114%	-185%	-6.5%	175%

Table 2: Managerial Horizon and Merger Performance

Panel A: Sorting Sample by MH1

The sample includes 2894 completed US acquisitions from January 1, 1993 to December 31, 2004. I sort all my deals into subsamples based on MH1, where MH1, my first proxy for managerial horizon, equals one if the CEO is less than 62 years old, and zero otherwise. A CEO with MH1=1 is expected to have a longer horizon than a CEO with MH1=0. CAR3 is the three-day accumulative abnormal returns around the announcement date. BHAR3 is the three-year buy-and-hold abnormal returns following the acquisition. The middle column and final column give the difference of the two means and the two medians, respectively. The tests of means are based on t-statistics; the tests of medians are based on Wilcoxon signed tests. The notation ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

	Mean			Median		
	MH1=1	MH1=0	Difference	MH1=1	MH1=0	Difference
	(1)	(2)	(1)-(2)	(4)	(5)	(4)-(5)
CAR3	0.1%	0.9%	-0.8%***	0.1%	0.6%	-0.5%***
BHAR3	-5%	-11%	6%*	-6.4%	-8.6%	2.4%

Panel B: Sorting Sample by MH2

The sample includes 2894 completed US acquisitions from January 1, 1993 to December 31, 2004. I sort all my deals into quintiles based on MH2. The variable MH2 is my second proxy for managerial horizon; it is computed as 1−*VestingEquity*, where *VestingEquity* is the value of the CEO's restricted stock and option holding that becomes vested in a given year normalized by the CEO's total annual pay. A CEO with a larger value of MH2 is expected to have a longer horizon. I report the means and medians for the largest and smallest quintiles. The middle column and final column give the difference of the two means and the two medians, respectively. The tests of means are based on t-statistics; the tests of medians are based on Wilcoxon signed tests. The notation ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

	Mean			Median		
	Largest MH2	Smallest MH2	Difference	Largest MH2	Smallest MH2	Difference
	(1)	(2)	(1)-(2)	(4)	(5)	(4)-(5)
CAR3	0.2%	-0.04%	0.24%	0.02%	0.2%	-0.18%
BHAR3	-0.8%	-13.5%	12.7%**	-5%	-9%	4%

Table 3: Regression Analysis on Announcement Period Abnormal Returns

The sample includes 2894 completed US acquisitions from January 1, 1993 to December 31, 2004. The dependent variable is three-day (-1,1) accumulative abnormal returns (in percentage), as defined in Table 1. The variables *Tender*, *Depression* and *Founder* are dummies that take the value of one if the deal is a tender offer, if the CEO is born during 1930s or earlier, and if the CEO is one of the firm's founders, respectively, and zero otherwise. Industry dummies are based on the 48-industry classification of Fama and French (1997). Corresponding p-values from Huber-White robust standard errors are reported in brackets. The notation ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
MH1	**-0.71** **[0.019]**	**-0.71** **[0.017]**	**-0.79** **[0.021]**			
MH2				**-0.05*** **[0.098]**	**-0.11***** **[0.006]**	**-0.11***** **[0.006]**
PastReturn		0.01*** [0.004]	0.01*** [0.003]		-0.007*** [0.003]	0.007*** [0.002]
M/B		-0.09** [0.012]	-0.09*** [0.1]		-0.09*** [0.01]	-0.09*** [0.01]
ROA		3.63** [0.027]	3.97** [0.015]		3.76** [0.02]	4.05** [0.014]
Size		-0.35*** [0.000]	-0.41** [0.001]		-0.36*** [0.000]	-0.39*** [0.001]
Leverage		1.11 [0.16]	1.18 [0.14]		1.49* [0.06]	1.54* [0.054]
Tender		-0.05 [0.91]	-0.05 [0.91]		0.04 [0.92]	0.07 [0.86]
Depression			0.17 [0.78]			0.75 [0.18]
Founder			-0.86*** [0.01]			-0.81** [0.015]
Ln(Totalpay)			0.03 [0.86]			0.002 [0.99]
FirmAge			-0.002 [0.86]			-0.002 [0.79]
Tenure			-0.005 [0.83]			0.01 [0.61]
Year&Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	0.82 [0.29]	6.89*** [0.000]	7.87*** [0.001]	0.44 [0.58]	6.37*** [0.000]	0.37 [0.88]
N	2893	2833	2833	2839	2779	2779
Adjusted-R2	2.2%	3.5%	3.7%	2.2%	3.7%	3.9%

Table 4: Logit Regression Analysis on the Likelihood of Stock Payment

This table reports logit models predicting the probability of stock payment in acquisitions. The sample includes 2894 completed US acquisitions from January 1, 1993 to December 31, 2004. The dependent variable is a dummy variable that equals one if acquirers pay the targets all by stock, and zero otherwise. The coefficients are estimates of the marginal effect on the probability when all of the independent variables are at their mean value. Corresponding p-values from Huber-White robust standard errors are reported in brackets. The notation ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
MH1	**0.08*** [0.000]**	**0.067*** [0.000]**	**0.063** [0.015]**			
MH2				**0.008** [0.042]**	**0.005* [0.055]**	**0.004* [0.078]**
PastReturn		0.000 [0.358]	0.000 [0.492]		0.000 [0.250]	0.000 [0.319]
M/B		0.013*** [0.000]	0.013*** [0.000]		0.014*** [0.000]	0.014*** [0.000]
ROA		-0.25** [0.012]	-0.26*** [0.008]		-0.23** [0.019]	-0.24** [0.018]
Size		0.003 [0.64]	0.003 [0.72]		0.001 [0.85]	-0.000 [0.96]
Leverage		-0.21*** [0.000]	-0.22*** [0.000]		-0.22*** [0.000]	-0.23*** [0.000]
Tender		-0.16*** [0.000]	-0.16*** [0.000]		-0.16*** [0.000]	-0.16*** [0.000]
Depression			-0.006 [0.91]			-0.054* [0.09]
Founder			0.052** [0.014]			0.049** [0.023]
Ln(Totalpay)			0.01 [0.22]			0.012 [0.17]
FirmAge			-0.000 [0.740]			-0.000 [0.924]
Tenure			-0.01 [0.48]			-0.02 [0.29]
Year&Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	2894	2765	2765	2818	2680	2680
Pseudo-R2	18.7%	23.3%	23.6%	18.7%	23.4%	23.7%

Table 5: Regression Analysis on Long-run Stock Performance Following the Acquisitions

This table reports regression results examining the effect of managerial horizon on long-term stock performance following acquisitions. The sample includes 2894 completed US acquisitions from January 1, 1993 to December 31, 2004. The dependent variable is three-year buy-and-hold abnormal returns (in percentage) after the completion date of the merger, as defined in Table 1. Corresponding p-values from Huber-White robust standard errors are reported in brackets. The notation ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
MH1	**9.09***	**10.89****	**15.4****			
	[0.089]	**[0.045]**	**[0.05]**			
MH2				**3.31*****	**2.98*****	**2.96*****
				[0.000]	**[0.000]**	**[0.000]**
PastReturn		0.018	0.018		0.044	0.045
		[0.58]	[0.58]		[0.19]	[0.19]
M/B		-0.81*	-0.86*		-0.93*	-0.97**
		[0.088]	[0.074]		[0.052]	[0.047]
ROA		69.27**	70.99**		65.92**	67.22**
		[0.029]	[0.026]		[0.042]	[0.039]
Size		3.32*	2.31		3.53**	3.01
		[0.052]	[0.26]		[0.04]	[0.15]
Leverage		-5.87	-6.47		-3.59	-3.79
		[0.71]	[0.67]		[0.82]	[0.81]
Tender		-4.13	-4.46		-2.76	-2.86
		[0.62]	[0.59]		[0.74]	[0.73]
Depression			2.71			-1.71
			[0.71]			[0.74]
Founder			0.32			-1.49
			[0.95]			[0.81]
Ln(Totalpay)			1.87			0.71
			[0.45]			[0.78]
FirmAge			0.054			0.073
			[0.77]			[0.69]
Tenure			0.53			0.42
			[0.18]			[0.29]
Year&Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	-0.197	-69.324*	-79.669*	13.312	-64.419*	-64.382
	[0.989]	[0.068]	[0.071]	[0.325]	[0.085]	[0.141]
N	2807	2751	2751	2753	2697	2697
Adjusted-R2	3.4%	3.7%	3.6%	4.5%	4.5%	4.3%

Table 6: Regression Analysis on Acquisition Frequency

This table reports regression results examining the effect of managerial horizon on acquisition frequency. The regression is based on the ExecuComp population firms from 1993 to 2004. The dependent variable is the number of acquisitions made by a company in a given year. Corresponding p-values from Huber-White robust standard errors are reported in brackets. The notation ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)	(4)
MH1	**0.053*** [0.000]**	**0.040** [0.019]**		
MH1×M/B		**0.005 [0.35]**		
MH2			**-0.003 [0.54]**	**-0.019 [0.24]**
MH2×M/B				**0.003*** [0.001]**
M/B	0.011*** [0.000]	0.007 [0.12]	0.012*** [0.000]	-0.325*** [0.002]
PastReturn	0.001*** [0.000]	0.001*** [0.000]	0.001*** [0.000]	0.001*** [0.000]
ROA	-0.099 [0.15]	-0.097 [0.15]	-0.097 [0.17]	-0.006 [0.91]
Size	0.069*** [0.000]	0.069*** [0.000]	0.069*** [0.000]	0.071*** [0.000]
Year&Industry Dummies	Yes	Yes	Yes	Yes
Intercept	-1.314*** [0.000]	-1.303*** [0.000]	-0.992** [0.041]	0.564 [0.389]
N	17543	17543	16880	16902
Adjusted-R2	6.7%	6.7%	6.6%	6.6%