# Why do bidder CEOs get disciplined following mergers

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# Why do Bidder CEOs Get Disciplined Following Mergers?

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**Abstract:** *This study examines the effect of CEOs' behavior (overconfidence/less overconfidence), merger period (in-wave/non-wave), method of payment (stock/cash), industry of merged firm (across-industry/within-industry), premium paid to target firm, and operating performance on the likelihood of a CEO turnover amongst bidding firms. Testing the US successful merger and acquisition data for the period of the 1990s, this study finds that the effect of merger waves and the method of payment on CEO turnover are positive and significant. Three measures of CEO behavior proposed and tested in this study, however, generally have insignificant effect on CEO turnover.*

*Keywords:* CEO turnover, CEO overconfidence, Merger Waves, Method of Payment, Merger Premium, Operating performance.

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## 1. Introduction

Compared to the large body of research that has examined the significant role of post-merger performance in disciplining bidder CEOs (e.g. Coughlan and Schmidt 1985; Warner et al. 1988; Weisbach 1988), much less is known about the role that bidder CEO behavior and the merger period play in effecting a turnover. This study aims to directly examine the influence of these two variables on the likelihood of bidder CEO turnovers. Theoretically, if bidder CEOs are overconfident in undertaking a merger, they may pay a high merger premium. The payment of a high premium which results in poor post-merger operating performance,in turn, causes bidder CEOs to face a higher probability of being replaced. In addition, if bidder CEOs make bids during merger waves, they may also pay high premiums since there would be reasonably tighter competition amongst the bidders. As their post-merger operating performancesdeteriorate because of the high premiums paid, they also to face a higher probability of being replaced. In both cases, bidder CEOs destroy the value that may be generated from the merger. As a consequence, the probability of these CEOs being replaced is much higher.

The aims of this study are also to examine the direct effect of the premium paid to target firms, the industry of merged firms, the method of payment used to finance the mergers, and the operating performance on the probability of CEO turnover. The payment of high premiums may cause negative NPV projects for bidders and, as a consequence, bidder CEOs are more likely to be disciplined (Lehn and Zhao 2006; Mitchell and Lehn 1990). Bidder CEOs who undertake inter-industry (diversified) mergers are less likely to successfully manage the merged firms as diversification increases the complexity of the resource allocation decisions (Finkelstein and Hambrick 1989) and managing diverse lines of business may require broader capabilities and knowledge (Rose and Shepard 1997). In turn, this CEOs may also face a higher probability of being replaced. On the other hand, bidder CEOs who use stock to complete mergers may face a lower probability of being replaced as they serve the interest of long-term shareholders of the bidders (Shleifer and Vishny 2003).

The results of this study indicate that CEOs' behavior and size of premiums paid to target firms generally have insignificant effects on CEO turnover. On the other hand, the effect of the period of merger on the turnover is positive and significant, meaning that bidder CEOs who undertake merger during merger wave face a higher probability of being replaced. The other significant result of this study is that the method of payment has a positive and significant effect on the probability of CEO turnover. This means bidder CEOs who use stock as a method of payment are more likely to be replaced. This result does not support the prediction that stock mergers serve the interest of long-term shareholders of the bidders (Shleifer and Vishny 2003) and, hence, the bidder CEOs will be more likely to preserve their position after the mergers. The result also indicates a tendency that CEOs of firms with higher pre-merger performance and lower post-merger performance are more likely to be disciplined.

The outline of this paper is as follows: Literature review and empirical predictions are presented in Section 2 and 3, respectively. Section 4 describes data and methods employed and Section 5 presents and discusses the results of this paper. Section 6 concludes the paper.

## 2. Literature Review

This study focuses on the effect of merger period, CEO behavior, premium paid to target firms, method of payment, industry of merged firm, and operating performance on the likelihood of CEO turnover among acquiring firms. The literature on the potential effect of these variables on CEO turnover are discussed in the following subsections.

### 2.1. Merger Waves and CEO Turnover

While a large body of research has examined the determinants of merger waves, relatively little is known about how the process of bidder CEO turnover depends on the effects of merger waves. The followings are plausible explanation for the effects of M&As undertaken during merger waves on CEO turnover. Firstly, bidder CEOs may take advantage of the wave to initiate value-destroying mergers that mainly benefit themselves. For instance, empire builders like assets under management and, if allowed, will tend to expand the boundaries of the firm far beyond its optimal scope (e.g. Grossman and Hart 1982; Jensen and Meckling 1976; Morck et al. 1990). Certainly, to curtail managerial empire building, board of directors can replace CEOs who engage in M&As that are deemed to be excessive. Duchin and Schmidt (2007) suggest that during merger waves the costs of empire building are lower and, therefore, the number of inefficient mergers is higher. This explanation may justify why bidder CEOs who undertake M&As during the waves are more likely to be dismissed. Secondly, many targets are available during the waves and a bidder CEO can choose a target firm that may result in the best outcome for the merged firms. This suggests that, contrary to the first explanation, during the merger waves the number of inefficient mergers is lower. This may explain why bidder CEOs who conduct M&As during the wave period are more likely to retain their position.

### 2.2. CEO Overconfidence and CEO Turnover

Lehn and Zhao (2006) examine the role of internal governance mechanisms in disciplining bidder CEOs who destroy value in M&As. They find that internal governance mechanisms discipline CEOs who conduct M&As that tend to result in value reduction. These CEOs may be affected by hubris (overconfidence) when undertaking mergers. Overconfidence may cause them to overestimate the value of target firms, their ability to manage the targets, or the gains/returns from mergers. Therefore, overconfidence CEOs tend to pay higher premiums and, in turn, result in poor post-merger operating performance. Based on these relations, cateris paribus, it axiomatic that overconfidence CEOs will face higher probability of being disciplined.

### 2.3. Method of Payment and CEO Turnover

The signaling hypothesis relies on the assumption that the managers have inside information concerning the true value of the firm. This hypothesis, as discussed by Myers and Majluf (1984) and DeAngelo et al. (1984), predicts that managers who are acting in the best interest of the existing stockholders prefer a cash offer if they believe their firm is

undervalued (interpreted as good news by market participants) and a common stock offer if they believe their firm is overvalued (interpreted as bad news by market participants). Lehn and Zhao (2006), who examine the relation between bidder returns and the probability of CEO turnover in bidding firms, report that, on average, 82% of the sample firms use stock or a combination of stock and cash as a method of payment for the mergers or acquisitions. Nevertheless, they find that the difference in the incidence of firms using stock versus cash as a method of payment across bidding firms with and without CEO turnover is not significant.

## 1.4. Industry of Merged Firms and CEO Turnover

Linking the argument of Finkelstein and Hambrick (1989) and Rose and Shepard (1997) with bidder CEOs turnover may raise two different perceptions. Firstly, as the decision in resource allocation becomes more difficult to make due to diversification (Finkelstein and Hambrick 1989) and broader capabilities and knowledge may be required in managing diverse lines of business (Rose and Shepard 1997), it is reasonable to assume that CEOs who undertake inter-industry mergers are less likely to successfully manage the merged firms and, in turn, they may face a higher probability of being replaced. Secondly, the supply of potential candidates is limited because diversified firms require CEOs with higher abilities. The need to hire CEOs of higher ability could thus increase the costs of CEO replacement and lowers the frequency of forced turnovers in diversified firms.

## 1.5. Premium Paid to Target Firms and CEO Turnover

Premiums are important not only due to their function as statements of pricing and bidders' expectations, but also due to their effect on ultimate mergers performance (Hayward and Hambrick 1997). Roll (1986) argues that the mistake of paying too much which stems from management who overrate the value created and synergistic gains from the M&As ultimately damages the operating performance following the M&As. Mitchell and Lehn (1990) and Lehn and Zhao (2006) also argue that the payment of high premiums may cause negative NPV projects for bidders and, as a consequence, bidder CEOs are more likely to be disciplined.

## 1.6. Operating Performance and CEO Turnover

Takeovers are often seen as a method for ousting incompetent CEOs who have failed to generate adequate performance with the firm's assets. A large body of research document that CEO turnover is high in firms that are targets of acquisitions, particularly if their pre-acquisition performance is poor (Hadlock et al. 1999; Harford 2003; Kini et al. 1995; Martin and McConnell 1991). Other studies, e.g. Mitchell and Lehn (1990) document that, in the 1980s, the market for corporate control disciplined CEOs who made value-destroying acquisitions. In line with this, Lehn and Zhao (2006) examine the role of internal governance mechanisms to discipline CEOs who destroy value in M&As. They find that internal governance mechanisms discipline CEOs who conduct M&As that tend to result in value destruction. These studies indicate that market for corporate control plays a

significant disciplinary role and the evidence suggests that the internal and external control mechanisms serve to discipline poorly performing CEOs.

## 3. Empirical Predictions

This study examines the direct effect of CEOs' behavior, the period of merger, the method of payment, the industry of merged firms, the premiums paid to target firms, and the operating performance on the likelihood of CEO turnover amongst bidding firms. It is argued that bidder CEOs are infected by hubris (overconfidence) in undertaking mergers. Due to their overconfidence, bidder CEOs pay higher premiums to the target firms which manifest in poor post-merger operating performance. Hence, it is predicted that (1) overconfident CEOs and (2) CEOs who pay higher merger premiums are more likely to be disciplined.

It is also argued that tighter competition amongst bidding firms exists during merger waves and even though there is only a single bidder CEOs may remain pay high premiums if there is a possibility for other bidders to enter the competition. In addition, CEOs may also pay high premiums since there would be an opportunity for them to pursue their own interest at the expense of shareholders (the shareholders may have a more difficult time in analyzing bidding firms during merger waves). For instance, empire builders like assets under management and, if allowed, will tend to expand the boundaries of the firm far beyond its optimal scope (e.g. Grossman and Hart 1982; Jensen and Meckling 1976; Morck et al. 1990). To curtail managerial empire building, board of directors can replace CEOs who engage in M&As that are deemed to be excessive. Based on this argument, it is predicted that (3) CEOs who undertake merger during merger waves are more likely to be replaced.

The arguments that diversification increases the complexity of the resource allocation decision (Finkelstein and Hambrick 1989) and managing diverse lines of business may require broader capabilities and knowledge (Rose and Shepard 1997) are also addressed in this study. These arguments imply that CEOs who undertake inter-industry (diversified) mergers are less likely to successfully manage the merged firms and, in turn, they may face a higher probability of being replaced. Based on this argument, it is predicted that (4) bidder CEOs who undertake inter-industry merger are more likely to be replaced.

This study also tests the view of Shleifer and Vishny (2003) that the stock mergers serve the interest of long-term shareholders of the bidders. If this view is accurate, bidder CEOs who use stock to complete their mergers are more likely to preserve their position after the mergers. Based on this argument, this study predicts that (5) CEOs who use stock to finance their mergers are less likely to be disciplined.

Mitchell and Lehn (1990) document that, in the 1980s, the market for corporate control disciplined CEOs who made value-destroying acquisitions. In line with this, Lehn and Zhao (2006) examine the role of internal governance mechanisms to discipline CEOs who destroy value in M&As. They find that the internal governance mechanisms discipline CEOs who conduct M&As that tend to result in value destruction. Based on the findings in these two studies, it is predicted that (6) bidder CEOs who produce poor post-merger operating performance are more likely to be dismissed.

In the interest of completeness, this study also argues that CEOs with longer tenure have more control on their firm and stronger influence on their board of directors. With this power in hand, CEOs tend to act not in the interest of shareholders and may destroy the value of mergers they undertake. Although the merger they conduct may become negative NPV projects for the bidders, it is predicted that (7) the CEOs with longer tenure may face a lower probability of being replaced due to the power in their hand. Additionally, CEOs with higher stock ownerships may have interest that is in line with that of shareholders. Therefore, it is predicted that (8) CEOs with higher stock ownerships are less likely to be replaced.

The predictions are summarized in Table 1 and the empirical findings, discussed in Section 5, are also previewed in the table.

## 4. Data and Methodology

### 4.1. Data

This study employsdata on mergers from Securities Data Company's (SDC) Mergers and Acquisitions database. The data gathered includes US M&A transactions that took place during the period of January 1991 to December 2000. Sample selection criteria include that both the bidder and target firms are publicly traded and the transaction value is at least US$60 million in 2005 dollars, which is in accordance with the Public Law 94-435 (known commonly as the HSR Act). These criteria result in an initial sample of 3,182 M&As. The financial and stock price data for merged companies are extracted from Standard and Poor's COMPUSTAT Research Tape (COMPUSTAT) and Centre for Research in Securities Price (CRSP) database, respectively. The requirement that all sample firms be listed on these two databases reduces the sample size to 729 mergers. The data for sample CEOs are collected from Execucomp database. The database provides comprehensive information on various aspects of CEOs such as the dates they are appointed, option packages including expiration dates and exercise prices, and CEOs' share ownerships. However, the information on options held by CEOs until the year of expiration—which is used as proxy for CEOs' overconfidence—is available only for the CEOs of acquiring firms in 294 M&As so there is a large drop in sample size.

### 4.2. Identification of CEO Turnover

The Execucomp database is used to identify CEO turnover. The identification is based on the date an individual becomes a CEO, the date the named executive officer left the position of CEO, and the reason the named executive officer left the company. A CEO who is replaced within three years following the completion of merger and left the company due to the reason other than retired is classified as a disciplined CEO.[1] All others are

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[1]  The database does not specifically describe if CEOs left their position due to death, poor health, or the acceptance of another position.

**Table 1**

The Predictions and The Findings for The Drivers of CEO Turnover



ᵃ=Univariate predictions and evidence, ᵐ=Multivariate predictions and evidence

classified as non-disciplined CEO. Of 294 CEOs in the sample firms used in this study, 106 are classified as disciplined CEOs. The three-year period is used as it is presumedthat the effect of pre-merger performance and factors other than firm's performance (e.g. macroeconomic) will be at a minimum compared to a period of lessand more than three years, respectively.

The definition of CEO turnover in this study is similar to Parrino's (1997) definition which is followed by Lehn and Zhao (2006) in examining bidders who get fired following mergers. Parino (1997) classifies CEO turnover as disciplinary if it is reported that the CEO is fired, forced to step down, or departs due to unspecified policy differences. Unlike this present study, Lehn and Zhou (2006) obtain the information about the circumstances surrounding CEO turnover from the Dow Jones News Retrieval services and proxy statements.

## 4.3. Measures of Overconfidence

This study designs measures of CEO overconfidence based on several variables extracted from Execucomp database. Since information on options held by CEOs until the year of expiration is available only for a small number of CEOs, it is not possible for this present study to apply Malmendier and Tate (2003) method which collects sample of CEOs from Hall and Liebman's data (1989) and classifies CEOs as overconfident when they hold their stock options until the last year before expiration. This study proposes several measures of CEOs' overconfidence measured prior to the year of merger announcement. It is argued that the measures proposed may better reflect the CEO overconfidence in undertaking M&As as they are assessed prior to merger announcement. The measures employed in this study are listed below (Execucomp's access item presented in italic)[2]:

1. Measure A. Proportion of stock options exercised: *soptexsh/(soptexsh+uexnumex)*. *Soptexsh* is the number of stock options exercised by CEOs and *uexnumex* is the number of unexercised vested stock options. CEOs are classified as overconfident if the percentage of options they exercise is smaller than both the annual average percentage and industry-year average percentage.

2. Measure B. Number of shares owned (*shrown*). CEOs are classified as overconfident if the number of shares they own shows an increase at the end of the year, irrespective of whether or not they exercise their options.

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[2] Initially, this study proposes five measures of CEOs' behavior. The association amongst the measures proposed are tested using the *chi-square* test and the results of the test show that one measure is associated with the other measure, except for Measure 1 which has no association with Measure 2 (*Pearson* statistic = 0.012, significance = 0.911) and for Measure 2 which has no association with Measure 5 (Pearson statistic = 0.888, significance = 0.346). Although Measure 1 has an association with Measure 5 (*Pearson* statistic = 43.937, significance < 0.001), both measures are used in this study as the contingency coefficient from the symmetric measures indicates a value of 0.380 with a significance of <0.001, which suggest that there is a weak relationship between the two measures. Measure 1, Measure 2 and Measure 5 are then renamed as Measure A, Measure B, and Measure C, respectively.

3.  Measure C. CEO's behavior is measured using net average value realized from exer-
    cising options (*soptexer*/*soptexsh*) and the average value the CEOs would have real-
    ized at year end if they had exercised all of their vested options that had an exercise
    price below the market price (*inmonex*/*uexnumex*). CEOs are classified as overconfi-
    dent if *inmonex*/*uexnumex* is greater than*soptexer*/*soptexsh*.
        CEO overconfidence is a dummy variable that takes the value of one for overconfi-
dent CEO and zero for a less overconfident CEO.

### 4.4. Identification of Merger Wave

This study follows Harford's (2005) simulation procedure to identify M&A waves.
The procedure is implemented as follows: each bidder and target is sorted into one of 48
industry groups, based on their respective SIC codes (as per Fama and French 1997) at
the time of the bid announcement. Bidders and targets from industries are assigned to
their own industry. For each industry, the highest concentration of completed and uncom-
pleted merger bids involving firms in that industry within a 24-month period (overlap)—as
per Mitchell and Mulherin (1996)—is identified and tagged as a potential wave. To con-
firm a potential wave as an actual wave the following simulation procedure is followed to
construct a distribution of merger concentrations that facilitates testing of the economic
significance of each merger wave concentration. The total number of merger bids for a
given industry over the 120-month sample period (i.e., 10 years x 12 months) is identified.
Each bid is then randomly assigned to one of the 120-months with the probability of
assignment being 1/120 for each month. This is repeated 1000 times. Then, the highest
concentration of merger activity within a 24-month period from each of the 1000 draws is
calculated. The actual concentration of activity from the potential wave is compared to
the empirical distribution based on the simulated data. If the actual peak concentration
exceeds the 95th percentile from that empirical distribution, that period is coded as a
wave. The final result of the mergers simulation in this study is 28 waves. The average
number of bids during the 24-month wave period over the 10-years sampling period is 53
whereas the average number of bids during the 24-month non-wave period is 14.3. Merger
period is a dummy variable that takes the value of one for mergers that occur during the
waves and zero for those that occur outside the wave.

### 4.5. Measure of Bid Premium

Similar to Raj and Forsyth (2003), Hayward and Hambrick (1997), and Crawford and
Lechner (1996), the acquisition premium is calculated over the period in which target
stock price is not affected by the information about the takeover. In this study, the window
begins 30 trading days before the first announcement of the takeover and ends when the
offer is accepted by the target shareholders. Bid premiums are calculated as: (bid offer –
target price$_{-30}$)/target price$_{-30}$. Bid offer is the final price paid per target share by the
bidder and target price$_{-30}$ is the value of the target shares thirty days prior to the first bid
announcement.

### 4.6. Measure of Operating Performance

Similar to Harford (2005), this study employs a set of measure of operating performance which consists of net income [A172] to sales [A12], asset turnover (sales [A12]/ average of total assets [A6]), return on assets (operating income [A13]/average of total assets [A6]), sales [A12] growth, and market [A24xA25] to book [A60]. The pre-merger operating performance is the average of years -3 to -1 relative to the announcement industry-adjusted performance and the post-merger industry-adjusted operating performance is the average of years +1 to +3 relative to merger completion. This study does not employ market based measures of performance because, as explained by Healy et al. (1992), it is difficult to distinguish whether the equity gains are due to real economic gains or market inefficiency. In addition, to unravel this dilemma, they suggest examining merger related operating performance using accounting based measures instead of market based measures.

## 5. Empirical Results

### 5.1. Sample Descriptive Statistics

The samples of successful mergers are broken down into two subsamples: with and without disciplined CEOs. The mean and the median values of the variables examined for the two subsamples and for the full sample (294 successful mergers) are presented in Table 2. The subsamples consist of bidder CEOs who are disciplined (106 mergers) and those who are not disciplined (188 mergers) within three years following the mergers completion. The first part of the table consists of seven variables classified as non-measure of performance variable. Four of them are dummy variables i.e., CEO's behavior, period of merger, industry of the merged firms, and method of payment. CEOs' behavior takes the value of one for overconfident CEO and zero for less overconfident CEO. The measures of CEOs' behavior employed are MeasureA based on relative amount of stock options exercised, Measure B based on net increase in stock owned, and Measure C based on net average value of stock options realized. The period of merger takes the value of one for mergers occurring during merger waves (in-wave merger) and zero for merger occurring outside waves (non-wave merger). The industry of merged firms is set as one if the acquiring and acquired firms belong to the same industry (intra-industry) and zero if the merged firms are from different industries (inter-industry). The method of payment is one if stock is used and zero if cash is used.

As reported in the first part of the table (non-measure of performance), on average, 63%, 70%, and 50% of CEOs in the sample are overconfident if Measure A, Measure B, and Measure C is used as a measure of CEO's behavior, respectively. The means of the overconfident CEOs in the firms with (56%) and without (67%) CEO turnover are significantly different (at 0.1 level) only when Measure A is used to assess CEOs' over-confidence. When measure B is used, the means of overconfident CEO in the firms with and without CEO turnover are 66% and 72%, respectively, and when measure C is employed these values are 53% and 49%, respectively. These results, in general, do not support the prediction that the overconfident CEOs are more likely to be replaced.

For the method of payment, on average, 66% bidder CEOs in the full sample use stock to complete their mergers. The means of bidder CEOs who use stock as a method of payment are significantly different (at 0.01 level) across the bidders with CEO turnover (78%) and without CEO turnover (59%). As more CEOs get disciplined following the stock mergers, the result suggests that bidder CEOs who use stock to finance their mergers are more likely to be replaced. This finding does not support the hypothesis developed earlier that CEOs who use their own firm's over-valued stock in acquisitions are acting in the interests of long-term shareholders.

Themeans of the industry of merged firms for the entire sample indicates that, on average, 60% of acquisitionsare intra-industry merger. The means of intra-industry mergers for firms with (63%) and without (58%) CEO turnover are insignificantly different, which does not support the prediction that bidder CEOs who undertakes inter-industry merger are more likely to be replaced. The median test for CEOs' behavior, the method of payment, and the industry of merged firms cannot be undertaken because all values are less than or equal to the median.

Another dummy variable in the first part of Table 2 is the period of merger. On average, 30% of mergers occur during merger waves. The difference in the means of mergers that occur during waves between companies with (43%) and without (23%) CEO turnover is significant at 0.01 level, which supports the prediction that CEOs who undertake a merger during the wave period face a higher probability of being replaced. The difference in median values of this variable is insignificant.

The other three variables in the first part of Table 2 are the premiums paid to target firms, CEO tenure, and CEO stock ownerships. Shares owned by CEOs is divided by the number of shares outstanding to obtain CEOs stock ownership percentage and the difference between the date an individual becomes a CEO and the date the mergers announced is used to determine CEO tenure.

For the total sample, the mean (median) of premiums paid is 0.480 (0.451). The mean and the median values of this variable are slightly higher for firms without CEO turnover (0.490 and 0.459) than for those with CEO turnover (0.462 and 0.444). These differences, however, are insignificant. For CEO tenure, the average for the full sample is 7.5 and the difference in the means of CEO tenure across the two subsamples is insignificant. Similar result holds for the median of CEO tenure. These do not support the prediction that bidder CEOs with longer tenure (and, hence, more power in their hand) are less likely to be replaced.

For CEO stock ownership, the mean (median) for the entire sample is 1.646 (0.157). The mean value of this variable is significantly higher (at level of 0.05) for firms with CEO turnover (2.413) than for that without CEO turnover (1.222). This does not support the prediction that CEOs with higher stock ownership are less likely to be replaced. The median value of this variable across the two subsamples, however, is not significantly different.

The second part of Table 2 (pre-merger performance) reports the mean and the median values of five measures of pre-merger performance (net income to sales, asset turnover, return on assets, sales growth, and market-to-book) for the entire sample and

the two subsamples. The mean of industry-adjusted net income to sales and the median of net income to sales of the acquiring firms before their respective mergers—across firms with and without CEO turnover—are insignificantly different. For the entire sample, the mean (median) of this variable during three years before the merger is 0.186 (0.019). The mean (0.559) and median (0.031) of pre-merger net income to sales for firms with CEO turnover are higher than the mean (-0.027) and median (0.017) for firms without CEO turnover. However, none of the differences in mean and median values are significant.

For the whole sample, the mean (median) of the industry-adjusted asset turnover of bidding firms during three years before the merger is 1.298 (0.002). Firms with CEO turnover have higher mean and median values for asset turnover (3.396 and 0.082, respectively) than firms without CEO turnover (0.102 and -0.009, respectively). However, the difference is significant (at 0.1 level) only for the median value. Similar results hold for the industry-adjusted return on assets and the industry-adjusted sales growth. The mean (median) of return on assets for firms with CEO turnover is 0.313 (0.087) and for firms without CEO turnover is 0.038 (0.027). For the whole sample, the mean (median) of return on assets is 0.137 (0.044). The mean (median) of sales growth for firms with CEO turnover is 0.598 (0.129) and for firms without CEO turnover is 0.257 (0.034). For the full sample, the mean (median) of sales growth is 0.381 (0.057). The differences in the median values of return on assets and the median values of sales growth across firms with and without CEO turnover is significant at the 0.01 and 0.05 levels, respectively. On the other hand, the difference in the mean values of both variables is insignificant.

Significant differences exist in the mean and the median of industry-adjusted market-to-book across the two subsamples over three years before the respective merger. The mean (median) value of this variable is 3.336 (1.647) for firms with CEO turnover and 1.485 (0.684) for firms without CEO turnover. These differences are significant at the 0.01 level. For the full sample, the mean and the median of market-to-book are 2.157 and 0.973, respectively. In general, the descriptive statistics concerning the difference in the mean and the median of pre-merger operating performance across firm with and without disciplined CEOs reveal that firms with disciplined CEOs tend to have better pre-merger operating performance.

The last part of Table 2 (post-merger performance) reports the mean and the median values of five measures of post-merger operating performance for the entire sample and the two subsamples. For the entire sample, the mean (median) of industry-adjusted net income to sales during three years after the respective merger is "0.026 (0.033). A significant difference exists (at level of 0.05) between the mean of net income to sales across firms with (-0.233) and without (0.089) CEO turnover. However, the median value of this variable is insignificantly different across firms with (0.038) and without (0.033) CEO turnover. Similar results hold for the mean and the median of industry-adjusted sales growth. For this variable, the mean (median) of the whole sample, the subsample with CEO turnover, and the subsample without CEO turnover are -0.021, -0.049, and-0.005 ("0.022, "0.021, and "0.023), respectively. The mean difference across subsamples is significant at 0.1 level. The descriptive statistics for these two measures of post-merger operating performance indicate that the means for bidders with CEO turnover are signifi-

## Table 2

### Sample descriptive statistics–full sample

This table presents the mean and median values of variables examined for the sample of 294 successful M&As. CEOs of acquiring companies who are disciplined following M&As (106 firms) are included in "CEO Turnover" and those who keep their position following M&As (188 firms) are included in "No CEO turnover". A CEO is classified as a disciplined one if he/she was replaced within three years following the completion of M&As and the reason he/she left the company is other than retired. CEO behavior is a dummy variable that takes the value of one for overconfident CEOs and zero for less overconfident CEOs. Three measure of CEO behavior i.e., Measure A, Measure B, and Measure C, are employed and each of their definitions can be seen in section 5.3.3 (Measure of Overconfidence). The period of merger, the method of payment, and the industry of merged firms are also dummy variables. The period of merger takes the value of one for mergers that occur during the waves (in wave merger) and zero for mergers that occur outside the waves (non-wave merger). The method of payment equals one if stock is used and equals zero if cash is used. The industry of merged firms is set as one if the acquiring and acquired firms belong to the same industry (intra-industry) and is set as zero if the merged firms are from different industries (inter-industry). Premium paid to a target firm is calculated as (bid offer – target price$_{-30}$)/target price$_{-30}$. Bid offer is the final price paid per target share by the bidder and target price$_{-30}$ is the value of the target shares thirty days prior to the first bid announcement. Shares owned by CEOs is divided by number of shares outstanding to obtain the percentage of CEOs' stock ownership, and the difference between the date an individual becomes a CEO and the date the mergers announced is used to determine CEO tenure. The mean industry-adjusted net income to sales, asset turnover, return on assets, sales growth, and market-to-book over the three years before the merger announcement are used to measure the pre-merger performance. The mean industry-adjusted net income to sales, asset turnover, return on assets, sales growth, and market-to-book over the three years after the first consolidated financial statement published are used to measure the post-merger performance. *T*-statistics corresponding to the difference in the means and Z-statistics corresponding to the difference in medians are shown in parentheses.

| | Total Sample N=294 (100%) | | No CEO Turnover N=188 (63.9%) | | CEO Turnover N=106 (36.1%) | | Differences | |
|---|---|---|---|---|---|---|---|---|
| | Mean | Median | Mean | Median | Mean | Median | Mean | Median |
| *Non-measure of performance* | | | | | | | | |
| CEO behavior (A)$^+$ | 0.630 | 1 | 0.667 | 1 | 0.559 | 1 | 0.108 * | 0 |
| | | | | | | | (1.725) | |
| CEO behavior (B)$^+$ | 0.700 | 1 | 0.723 | 1 | 0.660 | 1 | 0.063 | 0 |
| | | | | | | | (1.132) | |
| CEO behavior (C)$^+$ | 0.500 | 1 | 0.489 | 0 | 0.528 | 1 | -0.039 | -1 |
| | | | | | | | (-0.639) | |
| Merger period | 0.300 | 0 | 0.234 | 0 | 0.425 | 0 | -0.190 *** | 0 |
| | | | | | | | (-3.471) | (-1.651) |
| Payment method$^+$ | 0.660 | 1 | 0.592 | 1 | 0.779 | 1 | -0.187 *** | 0 |
| | | | | | | | (-2.773) | |
| Firm industry$^+$ | 0.600 | 1 | 0.580 | 1 | 0.632 | 1 | -0.052 | 0 |
| | | | | | | | (-0.876) | |
| Premiums paid | 0.480 | 0.451 | 0.490 | 0.459 | 0.462 | 0.444 | 0.028 | 0.015 |
| | | | | | | | (0.693) | (-0.603) |
| CEO tenure | 7.523 | 5.974 | 7.589 | 5.622 | 7.406 | 6.677 | 0.183 | -1.056 |
| | | | | | | | (0.240) | (1.068) |
| Stock ownerships % | 1.646 | 0.157 | 1.222 | 0.134 | 2.413 | 0.199 | -1.191 ** | -0.065 |
| | | | | | | | (-2.146) | (1.089) |
| *Pre-merger performance* | | | | | | | | |
| NI/Sales | 0.186 | 0.019 | -0.027 | 0.017 | 0.559 | 0.031 | -0.586 | -0.014 |
| | | | | | | | (-1.102) | (0.874) |
| ATO | 1.298 | 0.002 | 0.102 | -0.009 | 3.396 | 0.082 | -3.293 | -0.091 ‹ |
| | | | | | | | (-1.384) | (1.845) |
| ROA | 0.137 | 0.044 | 0.038 | 0.027 | 0.313 | 0.087 | -0.276 | -0.060 *** |
| | | | | | | | (-1.612) | (3.513) |
| Sales growth | 0.381 | 0.057 | 0.257 | 0.034 | 0.598 | 0.129 | -0.342 | -0.095 ‹‹ |
| | | | | | | | (-1.463) | (2.040) |
| M/B | 2.157 | 0.973 | 1.485 | 0.684 | 3.336 | 1.647 | -1.850 *** | -0.963 *** |
| | | | | | | | (-3.961) | (2.622) |

*Significant at 1% level; **Significant at 5% level; *Significant at 10% level.
$^+$Median test cannot be performed as all values are less than or equal to the median.

**Table** 2 (*Continued*)

| | Total Sample N=294 (100%) | | No CEO Turnover N=188 (63.9%) | | CEO Turnover N=106 (36.1%) | | Differences | |
|---|---|---|---|---|---|---|---|---|
| | Mean | Median | Mean | Median | Mean | Median | Mean | Median |
| *Post-merger performance* | | | | | | | | |
| NI/Sales | -0.026 | 0.033 | 0.089 | 0.033 | -0.233 | 0.038 | 0.322 ** | -0.005 |
| | | | | | | | (2.405) | (-0.098) |
| ATO | -0.073 | -0.133 | -0.063 | -0.124 | -0.091 | -0.171 | 0.028 | 0.047 |
| | | | | | | | (0.535) | (-1.275) |
| ROA | 0.093 | 0.040 | 0.091 | 0.033 | 0.097 | 0.056 | -0.006 | -0.023 |
| | | | | | | | (-0.310) | (0.597) |
| Sales growth | -0.021 | -0.022 | -0.005 | -0.023 | -0.049 | -0.021 | 0.044 * | -0.002 |
| | | | | | | | (1.808) | (0.097) |
| M/B | 1.870 | 0.942 | 2.038 | 0.999 | 1.567 | 0.634 | 0.471 | 0.365 |
| | | | | | | | (1.351) | (-0.883) |

***Significant at 1% level; **Significant at 5% level; *Significant at 10% level.

cantly lower than those without CEO turnover. These support the prediction that bidder CEOs are more likely to get disciplined for the poor operating performance they generate following mergers. For the other three measures of performance i.e., asset turnover, return on asset, and market-to-book, their industry-adjusted mean and median over three years after the respective merger are insignificantly different across bidders with and without CEO turnover, either in the full sample or in the two subsamples.

All of the non-dummy variables presented in Table 2are then screened to meet the normality assumption. The results, presented in Appendix 1, are very similar to those shown in Table 2 where the mean of CEOs stock ownership for firms with CEO turnover is significantly higher than that without CEO turnover. The results also show that the significant differences exist not only in the median of the four measures of pre-merger performance across firms with and without CEO turnover (similar to those presented in Table 2), but also in the mean value of all measures of pre-merger performance employed. Both the mean and the median of the measures of pre-merger performances employed for firms with CEO turnover are significantly higher than those without CEO turnover. It can be concluded that, over three years before the mergers, the pre-merger operating performance of firms with CEO turnover is better than that without CEO turnover.

For post-merger performance, the results indicate a similar tendency to those presented in Table 2where the mean of post-merger operating performance for firms with CEO turnover is significantly lower than that without CEO turnover. In addition, the results also indicate that the median of post-merger operating performance for bidders with CEO turnover is significantly lower than that without CEO turnover. Based on these results, it can be concluded that bidder CEOs who produce poor post-merger operating performance face a higher probability of being replaced. This finding supports the prediction formulated.

## 5.2. Multivariate Test

To determine whether the results from the univariate tests hold after controlling for other variables associated with CEO turnover, several logit regression models are estimated. In the logit models, the dependent variable is the probability of the replacement of bidder CEOs within three years following the completion of the mergers. This variable is a binary that takes the value of one for disciplined CEOs and zero for non-disciplined CEOs. The independent variables in the models employed are the CEOs' behavior, the period of merger, the premiums paid to target firms, the method of payment, the industry of merged firms, the CEO tenure, the CEO stock ownerships and the pre- and post-merger operating performance. The measures of operating performance employed are net income to sales, asset turnover, return on assets, sales growth, and market-to-book ratio.

### 5.2.1. The Effect of the Non-Measure of Performance and the Post-Merger Operating Performance on the CEO Turnover

Prior to the third test discussed in this section, this study conducts two tests i.e., (1) test of the effect of the non-measure of performance and (2) the effect of the operating performance on the CEO turnover. The results of the first and the second tests are presented in Appendix 2 and Appendix 3, respectively, and they are discussed along with the results of the third test (in this section) and the fourth test (in the next section). In the third test, the non-measure of performance and the measures of post-merger operating performance variables are entered into the logit models in order to examine their effects on the likelihood of CEO turnover. The non-measure of performance variables include the CEOs' behavior, the period of merger, the premiums paid to target firms, the method of payment, the industry of merged firms, the CEO tenure, and the CEO stock ownerships.

The results of the logit test presented in Panel A, Panel B, and Panel C of Table 3 indicate that the period of merger has a positive and significant effect (at level ≤ 0.05) on CEO turnover (except in Model 7 and Model 8 of each panel), the method of payment positively and significantly affects the CEO turnover (at level 0.01) in all models, and the interaction term of the period of merger and the premiums paid to target firms also has a positive and significant effect (at level ≤ 0.1) on the likelihood of CEO turnover (see Model A7 and A8, and Model B7 and Model C7).

The result for period of merger is similar to that of the first test undertaken earlier (presented in Appendix 2) that indicates that the period of merger itself can explain the probability of bidder CEOs turnover i.e., CEOs who undertake merger during the merger waves are more likely to be replaced which is consistent with the prediction made. This result is also parallel to that presented in Table 2 that the mean of CEOs who undertake merger during the waves and then get disciplined is higher than that who undertake merger during the waves and do not get disciplined.

For the method of payment, the result is consistent with that in the first test (see all panels in Appendix 2) and is also in line with the result shown in Table 2 that the mean of CEOs who use stock and then get disciplined is higher than that who use stock and do not get dismissed. This suggests that CEOs who use stock to finance their mergers are more

likely to be replaced, which is inconsistent with the prediction that bidder CEOs who use stock as a method of payment are less likely to be replaced.

The result for the interaction term of merger period and the premiums paid is also in line with that documented from the first test (see all panels in Appendix 2). The coefficient of this variable is positive, meaning that the higher the premiums paid by CEOs during the merger wave, the higher the probability they will be disciplined.

In several models of Panel A in Table 3, CEOs' behavior—assessed with Measure A—has a negative and significant effect on CEO turnover, indicating that CEO overconfidence is associated with a lower probability of CEO turnover which is consistent with the finding presented in Panel A of Appendix 2. However, this variable, if measured with either Measure B or Measure C, does not have any significant effect on the estimated logit which is also in line with the finding presented in Panel B and Panel C of Appendix 2. Both findings are inconsistent with the prediction that the overconfident CEO is more likely to be disciplined.

The results presented in Table 3 also demonstrate two tendencies. Firstly, the industry of merged firms in all models of all panels has negative coefficients, implying that CEOs of intra-industry mergers are less likely to be replaced. However, none of the effect is significant. This is consistent with the finding presented in Appendix 2 (see all panels). Secondly, almost all of the measures of post-merger operating performance employed have negative coefficients. The only measure with positive coefficient is return on asset and only Model C6 (see Panel C of Table 3) has a significant effect on CEO turnover. These results are consistent with those from the earlier test (the second test) conducted which are listed in Appendix 3 (Model 1 to Model 6). However, in this earlier test whereeach post-merger operating performance is individually regressed on CEO turnover, the post-merger net income to sales (Model 2) and post-merger sales growth (Model 4) have significant effects (at level of 0.1) on the estimated logit.

When all measures of operating performance are entered into one model (see Model 6 of Appendix 3), the effect of these measures (except assets turnover) on CEO turnover are significant, suggesting that the lower the post-merger operating performance, the higher the probability of CEOs being replaced, which is consistent with the prediction made. Although the full model in Table 3 does not show any significant effect of measures of operating performance, it is worth noting that the effect of several measures of post-merger operating performance, as shown in Model 1 to Model 6 of Appendix 3, are significant. This means that, to some extent, bidder CEOs are more likely to be replaced because of poor post-merger operating performance, which in line with the prediction made. This is also consistent with the findings of (Coughlan and Schmidt 1985; Warner et al. 1988; Weisbach 1988).

The results reported in Table 3 also indicate that the CEO tenure and the CEO stock ownerships have positive coefficients, which is consistent with those presented in Appendix 2 (see all panels). However, none of the effects of these two variables on the CEO turnover is significant. The interaction terms of the CEOs' behavior and the period of merger, the CEO behaviors and the premiums paid to target firms, and the CEOs' behav-

ior, the period of merger and the premiums paid to the targets, as shown in all panels, have no significant effects on the CEO turnover. These are generally consistent with the findings shown in Appendix 2.

In general, the results in all panels of Table 3 are very similar and they confirm the findings presented in Appendix 2 that, overall, bidder CEOs (1) who undertake merger during the merger waves, (2) who undertake merger during the waves and pay higher premiums to the targets, and (3) who use stock as method of payment face a higher probability of being replaced. The first finding supports the prediction formulated and is consistent with the result of univariate test. The second finding also supports the prediction formulated but it is only partially in line with the result of the univariate test. The third finding is parallel to the result of the univariate test but it does not substantiate the prediction made.

Although the effect of the interaction amongst the CEOs' behavior, the merger period, and the premiums paid to target firms on the CEO turnover is no longer significant in the full models of Table 3 and Appendix 2, it is worth noting that in several models (see Model A7, Model B7, and Model C7 in Appendix 2) the effect of the interaction of these three variables on the CEO turnover is positive and significant. This means that, to some extent, overconfident CEOs who pay higher premiums during the merger waves are more likely to be replaced.

### 5.2.2. *The Effect of the Non-Measure of Performance and the Pre- and Post-Merger Operating Performance on the CEO Turnover*

The predictors in the logit models presented in Table 4 include the non-measure of performance and measures of the pre- and post-merger operating performance variables. The inclusion of the pre-merger operating performance into the models is intended to test its and the post-merger operating performance effects simultaneously on the CEO turnover. The results of the logit test for the non-measure of performance variables reported in the table generally confirm those presented in Table 3. Panel A, Panel B, and Panel C in Table 4 indicate that (1) the period of merger positively and significantly affects the CEO turnover in almost all of the models employed, (2) the method of payment also positively and significantly affects the dependent variable in all models employed, and (3) the interaction term of the period of merger and the premiums paid to the targets has a positive and significant effect on the CEO turnover. Similar to those reported in Panel A of Table 3, the results in Panel A of Table 4—in several models—also demonstrate a negative and significant effect of the CEOs' behavior (measured with Measure A) on the likelihood of CEO turnover. In Panel B and Panel C, all the models employed show insignificant effect of CEOs' behavior on CEO turnover.

The results of the logit test for the measures of merger operating performance presented in Table 4 indicate that the coefficients of the pre- and post-merger operating performance are generally positive and negative, respectively. These indicate a tendency for CEOs of firms with a higher pre-merger performance and lower post-merger performance to be more likely disciplined, which is similar to the results presented in Appendix 3

(Model 7 to Model 12). Nevertheless, in Panel A, the pre-merger return on assets and the pre-merger market-to-book are the only two predictors that have significant effects on CEO turnover. In Panel B and Panel C, these two variables, along with the pre-merger sales growth and the post-merger net income to sales, also affect the estimated logit significantly. Based on these findings, it may be concluded that bidder CEOs are more likely to be disciplined if their firms have better performance prior to merger and poorer performance following merger.

In all models of Table 4 (see all panels), the results of the logit test also demonstrate the following: there is no significant effect of the premiums paid to the target firms on CEO turnover, the effects of CEO tenure and CEO stock ownership are generally insignificant, and the effect of the industry of merged firms on the CEO turnover is negative and insignificant. The other results demonstrate that none of the coefficient of the interaction terms of the CEOs' behavior and the period of merger, the CEOs' behavior and the premium paid to the targets, and the CEOs' behavior, the period of merger and the premium paid to the targets is significant. These results are consistent with those presented in Table 3.

The results of the logit test for the measures of merger operating performance presented in Table 4 indicate that the coefficients of the pre- and post-merger operating performance are generally positive and negative, respectively. These indicate a tendency for CEOs of firms with a higher pre-merger performance and lower post-merger performance to be more likelydisciplined, which is similar to the results presented in Appendix 3 (Model 7 to Model 12). Nevertheless, in Panel A, the pre-merger return on assets and the pre-merger market-to-book are the only two predictors that have significant effects on CEO turnover. In Panel B and Panel C, these two variables, along with the pre-merger sales growth and the post-merger net income to sales, also affect the estimated logit significantly. Based on these findings, it may be concluded that bidder CEOs are more likely to be disciplined if their firms have better performance prior to merger and poorer performance following merger.

In all models of Table 4 (see all panels), the results of the logit test also demonstrate the following: there is no significant effect of the premiums paid to the target firms on CEO turnover, the effects of CEO tenure and CEO stock ownership are generally insignificant, and the effect of the industry of merged firms on the CEO turnover is negative and insignificant. The other results demonstrate that none of the coefficient of the interaction terms of the CEOs' behavior and the period of merger, the CEOs' behavior and the premium paid to the targets, and the CEOs' behavior, the period of merger and the premium paid to the targets is significant. These results are consistent with those presented in Table 3.

# Table 3

Using the measures of the post-merger operating performance, the CEOs' behavior and the other non-measures of performance to predict CEO turnover. Logit models are used to predict whether or not CEOs get disciplined following the mergers. CEO turnover is a binary that takes the value of one for a disciplined CEO and zero for a non-disciplined CEO. A CEO is classified as a disciplined one if he/she is replaced within three years following the completion of merger and the reason he/she left the company is other than retired. The explanatory variables employed are the measure of post-merger operating performance (net income to sales, asset turnover, return on assets, sales growth, and market-to-book ratio), the CEOs' behavior (measured with Measure A), the period of merger, the premiums paid to target firms, the method of payment, the CEO tenure, the CEO stock ownerships, and the industry of merged firms.

(Panel A) Measure A is used as a measure of CEO behavior

| | A1 | A2 | A3 | A4 | A5 | A6 | A7 | A8 |
|---|---|---|---|---|---|---|---|---|
| Intercept | -1.159 | -1.300 | -1.629 | -1.428 | -1.225 | -1.542 | -0.690 | -0.681 |
| | (-1.994) | (-2.281) | (-2.620) | (-2.486) | (-2.043) | (-2.366) | (-0.831) | (-0.761) |
| CEOs' behavior | -0.708* | -0.679* | -0.581 | -0.601 | -0.669* | -0.643* | -0.986 | -1.001 |
| | (-1.903) | (-1.833) | (-1.558) | (-1.621) | (-1.811) | (-1.657) | (-1.234) | (-1.029) |
| Merger period | 0.801** | 0.840** | 0.937** | 0.902** | 0.919** | 0.776* | -1.140 | -1.158 |
| | (2.117) | (2.225) | (2.500) | (2.409) | (2.456) | (1.956) | (-1.315) | (-1.064) |
| Premiums paid | -0.065 | 0.077 | 0.265 | 0.198 | 0.117 | 0.063 | -1.273 | -1.292 |
| | (-0.113) | (0.137) | (0.466) | (0.360) | (0.210) | (0.106) | (-1.117) | (-0.960) |
| Method of Payment | 1.032** | 1.151*** | 1.184*** | 1.090*** | 1.064*** | 1.109*** | 1.332*** | 1.332*** |
| | (2.559) | (2.831) | (2.861) | (2.706) | (2.630) | (2.580) | (2.878) | (2.875) |
| CEO tenure | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | (0.658) | (0.606) | (0.606) | (0.483) | (0.618) | (0.460) | (0.385) | (0.386) |
| CEO stock ownerships | 0.085 | 0.085 | 0.100 | 0.116 | 0.092 | 0.101 | 0.090 | 0.090 |
| | (0.645) | (0.688) | (0.789) | (0.900) | (0.737) | (0.670) | (0.548) | (0.545) |
| Industry of merged firm | -0.146 | -0.207 | -0.123 | -0.135 | -0.174 | -0.113 | -0.213 | -0.212 |
| | (-0.390) | (-0.556) | (-0.332) | (-0.365) | (-0.470) | (-0.294) | (-0.530) | (-0.530) |
| Post-merger NI/sales | -0.242 | | | | | -0.414 | -0.387 | -0.390 |
| | (-0.985) | | | | | (-0.772) | (-0.522) | (-0.517) |
| Post-merger ATO | | -0.365 | | | | -0.473 | -0.556 | -0.557 |
| | | (-0.869) | | | | (-0.927) | (-1.056) | (-1.055) |
| Post-merger ROA | | | 0.435 | | | 2.677 | 2.487 | 2.493 |
| | | | (0.393) | | | (1.485) | (1.240) | (1.231) |
| Post-merger sales growth | | | | -1.112 | | -1.352 | -1.263 | -1.268 |
| | | | | (-1.133) | | (-1.080) | (-0.951) | (-0.948) |
| Post-merger M/B | | | | | -0.038 | -0.061 | -0.063 | -0.063 |
| | | | | | (-0.590) | (-0.674) | (-0.689) | (-0.689) |
| Merger period x | | | | | | | 3.207** | 3.242* |
| | | | | | | | (2.456) | (1.737) |
| CEOs' behavior (A) x | | | | | | | 0.893 | 0.925 |
| | | | | | | | (1.073) | (0.636) |
| CEOs' behavior (A) x | | | | | | | -0.331 | -0.299 |
| | | | | | | | (-0.256) | (-0.168) |
| CEOs' behavior (A) x Merger period x | | | | | | | | -0.068 |
| | | | | | | | | (-0.026) |
| McFadden $R^2$ | 0.112 | 0.106 | 0.107 | 0.108 | 0.104 | 0.134 | 0.171 | 0.171 |
| # of observations | 160 | 160 | 158 | 161 | 160 | 158 | 158 | 158 |
| S.E. of regression | 0.465 | 0.466 | 0.466 | 0.466 | 0.467 | 0.464 | 0.457 | 0.458 |
| LR statistic | 23.979 | 22.725 | 22.583 | 23.376 | 22.307 | 28.165 | 36.023 | 36.023 |
| Probability (LR stat) | 0.002 | 0.004 | 0.004 | 0.003 | 0.004 | 0.005 | 0.002 | 0.003 |

***Significant at 1% level; **Significant at 5% level; *Significant at 10% level.

(Panel B) Measure B is used as a measure of CEO behavior

| | B1 | B2 | B3 | B4 | B5 | B6 | B7 | B8 |
|---|---|---|---|---|---|---|---|---|
| Intercept | -1.175 | -1.356 | -1.497 | -1.449 | -1.261 | -1.574 | -1.879 | -1.798 |
| | (-1.983) | (-2.342) | (-2.455) | (-2.475) | (-2.127) | (-2.456) | (-1.992) | (-1.819) |
| CEOs' behavior | -0.401 | -0.363 | -0.388 | -0.342 | -0.352 | -0.332 | 0.528 | 0.399 |
| | (-1.076) | (-0.976) | (-1.040) | (-0.915) | (-0.946) | (-0.866) | (0.618) | (0.405) |
| Merger period | 0.971*** | 1.013*** | 1.079*** | 1.068*** | 1.078*** | 0.945*** | 0.517 | 0.196 |
| | (2.812) | (2.942) | (3.144) | (3.108) | (3.142) | (2.634) | (0.555) | (0.126) |
| Premiums paid | 0.061 | 0.188 | 0.334 | 0.305 | 0.222 | 0.187 | 0.121 | -0.049 |
| | (0.112) | (0.355) | (0.622) | (0.584) | (0.422) | (0.333) | (0.100) | (-0.035) |
| Payment method | 0.913** | 1.000*** | 1.045*** | 0.947** | 0.933** | 0.949** | 1.090*** | 1.108*** |
| | (2.400) | (2.624) | (2.672) | (2.486) | (2.447) | (2.376) | (2.589) | (2.590) |
| CEO tenure | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | (0.817) | (0.784) | (0.816) | (0.720) | (0.837) | (0.816) | (0.749) | (0.706) |
| CEO stock ownerships | 0.018 | 0.017 | 0.019 | 0.021 | 0.018 | 0.011 | 0.015 | 0.017 |
| | (0.524) | (0.521) | (0.563) | (0.594) | (0.543) | (0.294) | (0.410) | (0.460) |
| Industry of the merged firms | -0.324 | -0.340 | -0.281 | -0.287 | -0.328 | -0.281 | -0.340 | -0.334 |
| | (-0.909) | (-0.960) | (-0.791) | (-0.812) | (-0.927) | (-0.764) | (-0.901) | (-0.883) |
| Post-merger NI/sales | -0.455 | | | | | -1.272 | -1.375 | -1.385 |
| | (-1.033) | | | | | (-1.339) | (-1.427) | (-1.434) |
| Post-merger ATO | | -0.318 | | | | -0.289 | -0.234 | -0.237 |
| | | (-0.812) | | | | (-0.641) | (-0.520) | (-0.527) |
| Post-merger ROA | | | -0.180 | | | 3.505 | 3.417 | 3.410 |
| | | | (-0.176) | | | (1.573) | (1.509) | (1.504) |
| Post-merger sales growth | | | | -1.259 | | -1.344 | -1.405 | -1.410 |
| | | | | (-1.421) | | (-1.262) | (-1.285) | (-1.289) |
| Post-merger M/B | | | | | -0.050 | -0.073 | -0.074 | -0.071 |
| | | | | | (-0.855) | (-0.913) | (-0.920) | (-0.870) |
| Merger period x | | | | | | | 2.204* | 2.815 |
| | | | | | | | (1.786) | (1.041) |
| CEOs' behavior (B) x | | | | | | | -0.787 | -0.401 |
| | | | | | | | (-0.965) | (-0.235) |
| CEOs' behavior (B) x | | | | | | | -1.133 | -0.884 |
| | | | | | | | (-0.839) | (-0.533) |
| CEOs' behavior (B) x Merger period x | | | | | | | | -0.778 |
| | | | | | | | | (-0.256) |
| McFadden $R^2$ | 0.097 | 0.087 | 0.090 | 0.094 | 0.088 | 0.121 | 0.145 | 0.145 |
| # of observations | 177 | 177 | 175 | 178 | 177 | 175 | 175 | 175 |
| S.E. of regression | 0.467 | 0.470 | 0.468 | 0.468 | 0.470 | 0.465 | 0.461 | 0.463 |
| LR statistic | 22.854 | 20.671 | 21.157 | 22.346 | 20.741 | 28.331 | 33.877 | 33.944 |
| Probability (LR stat) | 0.004 | 0.008 | 0.007 | 0.004 | 0.008 | 0.005 | 0.004 | 0.006 |

***Significant at 1% level; **Significant at 5% level; *Significant at 10% level.

## (Panel C) Measure C is used as a measure of CEO behavior

| | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 |
|---|---|---|---|---|---|---|---|---|
| Intercept | -1.346 | -1.516 | -1.697 | -1.603 | -1.427 | -1.713 | -1.390 | -1.677 |
| | (-2.524) | (-2.919) | (-3.027) | (-3.050) | (-2.668) | (-2.925) | (-1.961) | (-2.170) |
| CEOs' behavior | -0.317 | -0.282 | -0.207 | -0.257 | -0.247 | -0.256 | -0.037 | 0.374 |
| | (-0.942) | (-0.841) | (-0.616) | (-0.769) | (-0.738) | (-0.740) | (-0.055) | (0.471) |
| Merger period | 0.987 *** | 1.026*** | 1.098*** | 1.084*** | 1.095*** | 0.947*** | -0.271 | 0.234 |
| | (2.858) | (2.981) | (3.202) | (3.159) | (3.195) | (2.637) | (-0.363) | (0.263) |
| Premiums paid | 0.144 | 0.258 | 0.407 | 0.377 | 0.296 | 0.251 | -0.300 | 0.162 |
| | (0.270) | (0.492) | (0.766) | (0.732) | (0.570) | (0.455) | (-0.330) | (0.161) |
| Payment method | 0.874 ** | 0.964** | 0.998*** | 0.909** | 0.898** | 0.906 ** | 1.012** | 1.077 *** |
| | (2.310) | (2.547) | (2.581) | (2.406) | (2.377) | (2.289) | (2.477) | (2.586) |
| CEO tenure | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | (0.953) | (0.904) | (0.922) | (0.822) | (0.938) | (0.918) | (0.949) | (0.945) |
| CEO stock ownerships | 0.013 | 0.014 | 0.016 | 0.017 | 0.015 | 0.006 | 0.014 | 0.010 |
| | (0.387) | (0.409) | (0.500) | (0.484) | (0.451) | (0.157) | (0.393) | (0.290) |
| Industry of the merged firms | -0.294 | -0.312 | -0.260 | -0.260 | -0.301 | -0.256 | -0.359 | -0.310 |
| | (-0.824) | (-0.880) | (-0.731) | (-0.733) | (-0.850) | (-0.695) | (-0.949) | (-0.810) |
| Post-merger NI/sales | -0.487 | | | | | -1.345 | -1.497 | -1.482 |
| | (-1.081) | | | | | (-1.411) | (-1.474) | (-1.454) |
| Post-merger ATO | | -0.351 | | | | -0.324 | -0.319 | -0.298 |
| | | (-0.891) | | | | (-0.715) | (-0.694) | (-0.646) |
| Post-merger ROA | | | -0.223 | | | 3.713* | 3.603 | 3.566 |
| | | | (-0.218) | | | (1.656) | (1.565) | (1.541) |
| Post-merger sales growth | | | | -1.324 | | -1.405 | -1.526 | -1.323 |
| | | | | (-1.505) | | (-1.320) | (-1.379) | (-1.167) |
| Post-merger M/B | | | | | -0.052 | -0.077 | -0.079 | -0.073 |
| | | | | | (-0.874) | (-0.952) | (-0.965) | (-0.892) |
| Merger period x | | | | | | | 2.316* | 1.161 |
| | | | | | | | (1.953) | (0.720) |
| CEOs' behavior (C) x | | | | | | | 0.405 | -0.697 |
| | | | | | | | (0.547) | (-0.527) |
| CEOs' behavior (C) x | | | | | | | -0.930 | -1.894 |
| | | | | | | | (-0.795) | (-1.242) |
| CEOs' behavior (C) x Merger period x | | | | | | | | 2.461 |
| | | | | | | | | (1.006) |
| McFadden $R^2$ | 0.095 | 0.086 | 0.087 | 0.093 | 0.086 | 0.120 | 0.141 | 0.146 |
| # of observations | 177 | 177 | 175 | 178 | 177 | 175 | 175 | 175 |
| S.E. of regression | 0.467 | 0.470 | 0.470 | 0.468 | 0.470 | 0.465 | 0.461 | 0.460 |
| LR statistic | 22.589 | 20.430 | 20.457 | 22.103 | 20.395 | 28.133 | 33.042 | 34.064 |
| Probability (LR stat) | 0.004 | 0.009 | 0.009 | 0.005 | 0.009 | 0.005 | 0.005 | 0.005 |

***Significant at 1% level; **Significant at 5% level; *Significant at 10% level.

## Table 4

Using the measures of the pre- and the post-merger operating performance, CEOs' behavior, and the other non-measure of performance to predict CEO turnover

Logit models are used to predict whether or not CEOs get disciplined following mergers. CEO turnover is a binary that takes the value of one for a disciplined CEO and zero for a non-disciplined CEO. A CEO is classified as a disciplined one if he/she is replaced within three years following the completion of merger and the reason he/she left the company is other than retired. The explanatory variables employed the measures of the pre- and the post-merger operating performance (net income to sales, asset turnover, return on assets, sales growth, and market-to-book ratio), CEOs' behavior (measured using Measure A), the period of merger, the premiums paid to the targets, the method of payment, CEO tenure, CEO stock ownerships, and the industry of merged firms.

### (Panel A) Measure A is used as a measure of CEO behavior

| | A1 | A2 | A3 | A4 | A5 | A6 | A7 | A8 |
|---|---|---|---|---|---|---|---|---|
| Intercept | -1.317 | -1.321 | -1.711 | -1.468 | -1.361 | -2.050 | -1.062 | -0.976 |
| | (-2.207) | (-2.297) | (-2.654) | (-2.531) | (-2.193) | (-2.826) | (-1.166) | (-0.993) |
| CEOs' behavior | -0.755** | -0.651* | -0.450 | -0.629* | -0.715* | -0.648 | -1.120 | -1.276 |
| | (-2.000) | (-1.752) | (-1.173) | (-1.683) | (-1.870) | (-1.540) | (-1.279) | (-1.157) |
| Merger period | 0.835** | 0.806** | 0.880** | 0.889** | 0.608 | 0.583 | -1.694* | -1.862 |
| | (2.171) | (2.126) | (2.309) | (2.357) | (1.528) | (1.355) | (-1.770) | (-1.547) |
| Premiums paid | -0.042 | -0.017 | 0.069 | 0.158 | -0.153 | -0.157 | -1.662 | -1.853 |
| | (-0.072) | (-0.030) | (0.117) | (0.283) | (-0.264) | (-0.247) | (-1.337) | (-1.237) |
| Payment method | 1.131*** | 1.149*** | 1.261*** | 1.125*** | 1.016** | 1.306*** | 1.624*** | 1.630*** |
| | (2.754) | (2.816) | (2.978) | (2.786) | (2.456) | (2.765) | (3.140) | (3.138) |
| CEO tenure | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | (0.824) | (0.617) | (0.314) | (0.528) | (1.036) | (1.020) | (0.912) | (0.926) |
| CEO stock ownerships | 0.102 | 0.097 | 0.232* | 0.132 | 0.085 | 0.156 | 0.138 | 0.135 |
| | (0.669) | (0.752) | (1.779) | (0.910) | (0.518) | (0.937) | (0.740) | (0.717) |
| Industry of the merged firms | -0.105 | -0.135 | -0.196 | -0.100 | -0.058 | -0.161 | -0.352 | -0.354 |
| | (-0.279) | (-0.354) | (-0.515) | (-0.270) | (-0.151) | (-0.373) | (-0.770) | (-0.771) |
| Pre-merger NI/sales | -0.274* | | | | | -0.442 | -0.351 | -0.358 |
| | (-1.736) | | | | | (-1.342) | (-1.025) | (-1.044) |
| Post-merger NI/sales | -0.282 | | | | | -0.355 | -0.449 | -0.504 |
| | (-0.930) | | | | | (-0.491) | (-0.381) | (-0.409) |
| Pre-merger ATO | | 0.171 | | | | -0.039 | -0.091 | -0.101 |
| | | (0.536) | | | | (-0.081) | (-0.178) | (-0.196) |
| Post-merger ATO | | -0.499 | | | | -0.239 | -0.359 | -0.357 |
| | | (-1.024) | | | | (-0.371) | (-0.526) | (-0.523) |
| Pre-merger ROA | | | 2.041* | | | 3.703** | 4.062** | 4.084** |
| | | | (1.801) | | | (2.052) | (2.147) | (2.159) |
| Post-merger ROA | | | -0.344 | | | 0.025 | 0.128 | 0.212 |
| | | | (-0.271) | | | (0.011) | (0.048) | (0.079) |
| Pre-merger sales growth | | | | 0.078 | | 0.198 | 0.281 | 0.268 |
| | | | | (1.137) | | (0.518) | (0.678) | (0.645) |
| Post-merger sales growth | | | | -0.945 | | 0.103 | 0.446 | 0.395 |
| | | | | (-0.948) | | (0.074) | (0.291) | (0.256) |
| Pre-merger M/B | | | | | 0.139** | 0.137** | 0.129* | 0.131* |
| | | | | | (2.418) | (2.225) | (1.927) | (1.941) |
| Post-merger M/B | | | | | -0.072 | -0.083 | -0.079 | -0.080 |
| | | | | | (-1.037) | (-0.817) | (-0.789) | (-0.799) |
| Merger period x | | | | | | | 3.465** | 3.796* |
| | | | | | | | (2.438) | (1.881) |
| CEOs' behavior (A) x | | | | | | | 1.429 | 1.737 |
| | | | | | | | (1.536) | (1.077) |
| CEOs' behavior (A) x | | | | | | | -0.445 | -0.104 |
| | | | | | | | (-0.314) | (-0.051) |
| CEOs' behavior (A) x Merger period x | | | | | | | | -0.678 |
| | | | | | | | | (-0.234) |
| McFadden $R^2$ | 0.128 | 0.108 | 0.128 | 0.113 | 0.139 | 0.208 | 0.250 | 0.250 |
| # of observations | 158 | 158 | 156 | 159 | 158 | 156 | 156 | 156 |
| S.E. of regression | 0.463 | 0.469 | 0.464 | 0.469 | 0.458 | 0.452 | 0.444 | 0.446 |
| LR statistic | 27.028 | 22.916 | 26.789 | 24.176 | 29.394 | 43.348 | 52.242 | 52.296 |
| Probability (LR stat) | 0.001 | 0.006 | 0.002 | 0.004 | 0.001 | 0.000 | 0.000 | 0.000 |

***Significant at 1% level; **Significant at 5% level; *Significant at 10% level.

**(Panel B) Measure B is used as a measure of CEO behavior**

| | B1 | B2 | B3 | B4 | B5 | B6 | B7 | B8 |
|---|---|---|---|---|---|---|---|---|
| Intercept | -1.108 | -1.340 | -1.438 | -1.435 | -1.259 | -1.709 | -1.918 | -1.746 |
| | (-1.848) | (-2.266) | (-2.303) | (-2.412) | (-2.065) | (-2.504) | (-1.824) | (-1.538) |
| CEOs' behavior | -0.408 | -0.413 | -0.427 | -0.395 | -0.522 | -0.556 | 0.225 | -0.023 |
| | (-1.076) | (-1.090) | (-1.125) | (-1.043) | (-1.359) | (-1.360) | (0.242) | (-0.020) |
| Merger period | 0.942*** | 0.965*** | 0.999*** | 1.053*** | 0.788** | 0.671* | 0.318 | -0.192 |
| | (2.711) | (2.786) | (2.878) | (3.043) | (2.176) | (1.749) | (0.321) | (-0.117) |
| Premiums paid | -0.099 | 0.076 | 0.231 | 0.248 | -0.003 | -0.246 | -0.847 | -1.199 |
| | (-0.176) | (0.141) | (0.422) | (0.469) | (-0.006) | (-0.403) | (-0.603) | (-0.716) |
| Payment method | 0.907** | 0.997*** | 1.090*** | 0.969** | 0.901** | 1.086** | 1.286 *** | 1.307 *** |
| | (2.378) | (2.611) | (2.773) | (2.545) | (2.319) | (2.517) | (2.782) | (2.802) |
| CEO tenure | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000* | 0.000 * | 0.000 |
| | (0.878) | (0.821) | (0.907) | (0.765) | (1.180) | (1.648) | (1.656) | (1.587) |
| CEO stock ownerships | 0.010 | 0.011 | 0.023 | 0.017 | 0.006 | -0.029 | -0.028 | -0.025 |
| | (0.291) | (0.311) | (0.646) | (0.494) | (0.173) | (-0.747) | (-0.709) | (-0.630) |
| Industry of the merged firm | -0.255 | -0.254 | -0.319 | -0.249 | -0.258 | -0.358 | -0.443 | -0.424 |
| | (-0.707) | (-0.709) | (-0.884) | (-0.703) | (-0.711) | (-0.889) | (-1.070) | (-1.015) |
| Pre-merger NI/sales | 0.026 | | | | | 0.056 | 0.067 | 0.069 |
| | (0.627) | | | | | (0.952) | (1.073) | (1.111) |
| Post-merger NI/sales | -0.471 | | | | | -1.622 | -1.764 * | -1.774 * |
| | (-1.067) | | | | | (-1.645) | (-1.750) | (-1.755) |
| Pre-merger ATO | | 0.344 | | | | 0.148 | 0.139 | 0.138 |
| | | (1.094) | | | | (0.326) | (0.295) | (0.294) |
| Post-merger ATO | | -0.617 | | | | -0.172 | -0.094 | -0.095 |
| | | (-1.293) | | | | (-0.283) | (-0.150) | (-0.153) |
| Pre-merger ROA | | | 1.017 | | | 2.575* | 2.597 * | 2.578 * |
| | | | (1.258) | | | (1.888) | (1.952) | (1.940) |
| Post-merger ROA | | | -0.731 | | | 1.824 | 1.788 | 1.753 |
| | | | (-0.628) | | | (0.782) | (0.744) | (0.726) |
| Pre-merger sales growth | | | | 0.067 | | 0.258** | 0.280 ** | 0.282 ** |
| | | | | (0.994) | | (1.965) | (1.991) | (2.010) |
| Post-merger sales growth | | | | -1.123 | | -0.195 | -0.282 | -0.303 |
| | | | | (-1.256) | | (-0.167) | (-0.233) | (-0.250) |
| Pre-merger M/B | | | | | 0.133** | 0.112** | 0.109 * | 0.109 * |
| | | | | | (2.438) | (2.004) | (1.881) | (1.883) |
| Post-merger M/B | | | | | -0.083 | -0.068 | -0.068 | -0.062 |
| | | | | | (-1.330) | (-0.805) | (-0.778) | (-0.708) |
| Merger period x | | | | | | | 2.486 * | 3.456 |
| | | | | | | | (1.882) | (1.213) |
| CEOs' behavior (B) x | | | | | | | -1.072 | -0.456 |
| | | | | | | | (-1.230) | (-0.253) |
| CEOs' behavior (B) x | | | | | | | -0.729 | -0.241 |
| | | | | | | | (-0.479) | (-0.123) |
| CEOs' behavior (B) x Merger period x | | | | | | | | -1.243 |
| | | | | | | | | (-0.388) |
| McFadden $R^2$ | 0.100 | 0.093 | 0.101 | 0.096 | 0.119 | 0.188 | 0.217 | 0.218 |
| # of observations | 175 | 175 | 173 | 176 | 175 | 173 | 173 | 173 |
| S.E. of regression | 0.469 | 0.471 | 0.469 | 0.471 | 0.462 | 0.453 | 0.448 | 0.450 |
| LR statistic | 23.355 | 21.794 | 23.373 | 22.719 | 27.907 | 43.515 | 50.292 | 50.445 |
| Probability (LR stat) | 0.005 | 0.010 | 0.005 | 0.007 | 0.001 | 0.000 | 0.000 | 0.000 |

***Significant at 1% level; **Significant at 5% level; *Significant at 10% level.

(Panel C) Measure C is used as a measure of CEO behavior

| | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 |
|---|---|---|---|---|---|---|---|---|
| Intercept | -1.312 | -1.572 | -1.708 | -1.650 | -1.526 | -1.963 | -1.434 | -1.666 |
| | (-2.451) | (-2.989) | (-3.012) | (-3.103) | (-2.769) | (-3.121) | (-1.877) | (-2.006) |
| CEOs' behavior | -0.280 | -0.235 | -0.161 | -0.234 | -0.309 | -0.371 | -0.419 | -0.059 |
| | (-0.831) | (-0.696) | (-0.475) | (-0.697) | (-0.898) | (-1.005) | (-0.566) | (-0.067) |
| Merger period | 0.968*** | 0.986*** | 1.028*** | 1.077*** | 0.829** | 0.699* | -1.072 | -0.676 |
| | (2.791) | (2.850) | (2.971) | (3.119) | (2.306) | (1.821) | (-1.340) | (-0.709) |
| Premiums paid | -0.009 | 0.176 | 0.329 | 0.343 | 0.123 | -0.121 | -0.969 | -0.570 |
| | (-0.017) | (0.333) | (0.610) | (0.662) | (0.233) | (-0.202) | (-0.924) | (-0.491) |
| Payment method | 0.863** | 0.956** | 1.041*** | 0.922** | 0.847** | 1.009** | 1.200*** | 1.251*** |
| | (2.279) | (2.522) | (2.680) | (2.445) | (2.204) | (2.376) | (2.683) | (2.759) |
| CEO tenure | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000* | 0.000* | 0.000* |
| | (1.033) | (0.967) | (1.034) | (0.886) | (1.322) | (1.770) | (1.831) | (1.798) |
| CEO stock ownerships | 0.006 | 0.008 | 0.021 | 0.014 | 0.003 | -0.036 | -0.028 | -0.030 |
| | (0.164) | (0.235) | (0.603) | (0.409) | (0.092) | (-0.923) | (-0.736) | (-0.787) |
| Industry of the merged firms | -0.233 | -0.238 | -0.307 | -0.229 | -0.232 | -0.320 | -0.526 | -0.477 |
| | (-0.646) | (-0.662) | (-0.850) | (-0.647) | (-0.637) | (-0.792) | (-1.244) | (-1.117) |
| Pre-merger NI/sales | 0.028 | | | | | 0.058 | 0.064 | 0.060 |
| | (0.695) | | | | | (0.978) | (1.010) | (0.952) |
| Post-merger NI/sales | -0.500 | | | | | -1.788* | -2.263** | -2.226** |
| | (-1.110) | | | | | (-1.775) | (-2.052) | (-2.012) |
| Pre-merger ATO | | 0.315 | | | | 0.149 | 0.131 | 0.174 |
| | | (1.012) | | | | (0.342) | (0.275) | (0.365) |
| Post-merger ATO | | -0.612 | | | | -0.220 | -0.213 | -0.249 |
| | | (-1.301) | | | | (-0.368) | (-0.329) | (-0.383) |
| Pre-merger ROA | | | 0.955 | | | 2.452* | 3.085** | 2.981** |
| | | | (1.215) | | | (1.856) | (2.028) | (1.977) |
| Post-merger ROA | | | -0.692 | | | 2.407 | 2.344 | 2.354 |
| | | | (-0.600) | | | (1.010) | (0.933) | (0.933) |
| Pre-merger sales growth | | | | 0.064 | | 0.258** | 0.300** | 0.298** |
| | | | | (0.941) | | (1.988) | (2.194) | (2.165) |
| Post-merger sales growth | | | | -1.217 | | -0.415 | -0.361 | -0.176 |
| | | | | (-1.373) | | (-0.357) | (-0.294) | (-0.140) |
| Pre-merger M/B | | | | | 0.129** | 0.107* | 0.097* | 0.093 |
| | | | | | (2.373) | (1.928) | (1.683) | (1.581) |
| Post-merger M/B | | | | | -0.089 | -0.078 | -0.067 | -0.063 |
| | | | | | (-1.388) | (-0.892) | (-0.761) | (-0.703) |
| Merger period x | | | | | | | 2.735** | 1.821 |
| | | | | | | | (2.147) | (1.046) |
| CEOs' behavior (C) x | | | | | | | 1.139 | 0.268 |
| | | | | | | | (1.399) | (0.188) |
| CEOs' behavior (C) x | | | | | | | -0.966 | -1.803 |
| | | | | | | | (-0.739) | (-1.041) |
| CEO behavior (C) x Merger | | | | | | | | 1.978 |
| | | | | | | | | (0.742) |
| McFadden $R^2$ | 0.098 | 0.090 | 0.096 | 0.094 | 0.114 | 0.184 | 0.216 | 0.219 |
| # of observations | 175 | 175 | 173 | 176 | 175 | 173 | 173 | 173 |
| S.E. of regression | 0.469 | 0.472 | 0.471 | 0.471 | 0.463 | 0.455 | 0.447 | 0.447 |
| LR statistic | 22.890 | 21.091 | 22.334 | 22.120 | 26.868 | 42.681 | 50.174 | 50.729 |
| Probability (LR stat) | 0.006 | 0.012 | 0.008 | 0.009 | 0.001 | 0.001 | 0.000 | 0.000 |

***Significant at 1% level; **Significant at 5% level; *Significant at 10% level.

The results of the logit tests in, Table 3, and Table 4, and Appendix 2, overall, indicate that the effect of the period of merger on the CEO turnover is positive and significant, meaning that CEOs who undertake a merger during a wave period face a higher probability of being replaced. This finding seems inconsistent with the result reported in Soegiharto(2010)that CEOs who undertake mergers during the wave periods are more likely to produce better post-merger operating performance. How could a CEO who is more likely to produce better post-merger operating performance face a higher probability of being replaced? To answer this question, an analysis which compares the measures of pre- and post-merger operating performance of mergers undertaken during the waves and outside the waves is conducted and the results of this analysis is presented in Table 5.

For mergers undertaken both with and without wave periods (see Table 5), the pre-merger means of asset turnover, return on assets, and sales growth are all higher than the respective means in the post-merger period. The differences are significant at the 0.01 level. However, while the mean values of pre-merger net income to sales and pre-merger market-to-book for wave period mergers are not different significantly from their values of post-merger, they are higher in the post-merger period for mergers undertaken outside wave periods. The significant increases in the net income to sales (at 0.01 level) and the market-to-book (at 0.1 level) for mergers undertaken outside the waves and the insignificant changes in these two variables for mergers undertaken during the wave may explain why CEOs who conduct mergers during the waves face a higher probability of being replaced than those who undertaken mergers outside the waves (see Table 6). CEOs who undertake mergers outside the waves perform better than those who conduct mergers during the waves by generating significant increases on the net income to sales and the market-to-book following the mergers.

The method of payment, as presented in Table 3, and Table 4, and Appendix 2, has a significantly positive effect on CEO turnover; CEOs who use stock as method of payment are more likely to be replaced. This result does not support the hypothesis that stock mergers serve the interest of long-term shareholders of the bidders (Shleifer and Vishny 2003) and, hence, bidder CEOs will be more likely to preserve their position after merger. Why is it that CEOs who ostensibly serve the interest of long-term shareholders face a higher probability of being replaced? To answer this questions, the results of an analysis which compares the means and the medians of the measures of post-merger operating performance for the stock merger and the cash merger are presented in Table 7.

As can be seen Table 7, the mean and median values of net income to sales for the entire sample are 0.066 and 0.042, respectively. For merger financed with cash, the mean of the net income to sales is 0.072 and for merger financed with stock, the mean of the net income to sales is 0.063. The difference is not significant. The median of net income to sales for cash mergers and stock mergers are equal (0.042). Similar results hold for the sales growth variable i.e., the mean (0.001) and the median (0.002) values for cash mergers are not significantly different from the mean (-0.024) and the median (-0.031) values for stock mergers. For the full sample, the mean and median sales growth values are -0.015 and -0.022, respectively.

## Table 5

The pre- and post-merger operating performance for firms that merge during merger waves and outside the waves. This table reports the paired sample difference of the pre- and the post-merger operating performance for mergers undertaken during the waves and outside the waves. The measures of the operating performance are net income to sales, asset turnover, return on assets, sales growth, and market-to-book. T-statistics corresponding to the difference in the means is shown in parentheses

| | | Paired Samples Statistics | | | | Paired Samples Test: Paired Difference | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Mean | SD | SE Mean | N | | Mean | SD | SE |
| *Non-Wave Merger* | | | | | | | | | |
| NI/Sales | Pre-Merger | 0.020 | 0.036 | 0.003 | 140 | Pre-merger– Post-merger | -0.012*** (-2.644) | 0.052 | 0.004 |
| | Post-Merger | 0.032 | 0.055 | 0.005 | | | | | |
| ATO | Pre-Merger | -0.008 | 0.265 | 0.021 | 153 | Pre-merger– Post-merger | 0.129*** (5.520) | 0.289 | 0.023 |
| | Post-Merger | -0.137 | 0.229 | 0.019 | | | | | |
| ROA | Pre-Merger | 0.018 | 0.039 | 0.004 | 105 | Pre-merger– Post-merger | 0.013*** (3.355) | 0.039 | 0.004 |
| | Post-Merger | 0.005 | 0.036 | 0.004 | | | | | |
| Sales Growth | Pre-Merger | 0.038 | 0.113 | 0.009 | 153 | Pre-merger– Post-merger | 0.066*** (5.674) | 0.144 | 0.012 |
| | Post-Merger | -0.028 | 0.101 | 0.008 | | | | | |
| M/B | Pre-Merger | 0.602 | 0.853 | 0.072 | 139 | Pre-merger– Post-merger | -0.167** (-1.976) | 0.997 | 0.085 |
| | Post-Merger | 0.769 | 0.902 | 0.076 | | | | | |
| *In-Wave Merger* | | | | | | | | | |
| NI/Sales | Pre-Merger | 0.056 | 0.064 | 0.008 | 62 | Pre-merger– Post-merger | -0.016 (-1.412) | 0.087 | 0.011 |
| | Post-Merger | 0.072 | 0.107 | 0.014 | | | | | |
| ATO | Pre-Merger | -0.043 | 0.188 | 0.024 | 62 | Pre-merger– Post-merger | 0.114*** (4.018) | 0.224 | 0.028 |
| | Post-Merger | -0.157 | 0.231 | 0.029 | | | | | |
| ROA | Pre-Merger | 0.093 | 0.118 | 0.014 | 73 | Pre-merger– Post-merger | 0.048*** (3.334) | 0.123 | 0.014 |
| | Post-Merger | 0.045 | 0.090 | 0.011 | | | | | |
| Sales Growth | Pre-Merger | 0.042 | 0.113 | 0.015 | 56 | Pre-merger– Post-merger | 0.054*** (3.109) | 0.129 | 0.017 |
| | Post-Merger | -0.012 | 0.098 | 0.013 | | | | | |
| M/B | Pre-Merger | 1.408 | 1.500 | 0.188 | 64 | Pre-merger– Post-merger | 0.007 | 1.878 | 0.235 |

***Significant at 1% level; **Significant at 5% level; *Significant at 10% level.

## Table 6

The difference in the means of the post-merger net income to sales and market-to-book.The means of the net income to sales and the market-to-book are compared between mergers conducted during merger waves and outside the waves.

| | | Net Income to Sales | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | N | Mean | SD | SE Mean | Mean Difference | SE Difference | Sig. (2-tailed) |
| Merge Period | Non Wave Merger | 172 | 0.042 | 0.062 | 0.005 | -0.026 | 0.011 | **0.026** |
| | In Wave Merger | 69 | 0.067 | 0.113 | 0.014 | | | |

| | | Market-to-Book | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | N | Mean | SD | SE Mean | Mean Difference | SE Difference | Sig. (2-tailed) |
| Merger Period | Non Wave Merger | 160 | 0.784 | 0.935 | 0.074 | -0.565 | 0.181 | **0.002** |
| | In Wave Merger | 78 | 1.349 | 1.853 | 0.210 | | | |

Table 7 also indicates that the mean (-0.185) and the median (-0.200) values of asset turnover for cash mergers are lower than the mean (-0.116) and median (-0.078) values of asset turnover for stock mergers. These differences are significant at 0.1 level for the mean and at the 0.05 level for the median. For the whole sample, the mean (median) of asset turnover is "0.136 ("0.153). Contrary to the mean of asset turnover, the mean of return on assets for cash mergers (0.093) is significantly higher (at 0.01 level) than that for stock mergers (0.053). The median of return on assets, however, is not significantly different across the two subsamples. For the whole sample, the mean (median) of the return on assets is 0.067 (0.038). Similar results hold for the mean and the median values of market-to-book ratio i.e., the mean of market-to-book for cash merger (1.570) is significantly (at level of 0.01) higher than that for stock merger (0.890) and the median of market-to-book for cash merger (0.961) is not significantly different from that for stock merger (0.864). For the whole sample the mean and the median of the market-to-book are 1.134 and 0.907, respectively. The results for return on assets and market-to-book demonstrate that bidders of cash merger perform much better than those of stock merger. Hence, we can conclude that the poorer post-merger return on assets and post-merger market-to-book for stock mergers relative to cash mergers explains why CEOs who use stock as method of payment face a higher probability of being replaced.

**Table 7.**

The Post-merger operating performance and the method of payment

This table presents the mean and median values of the measures of the post-merger operating performance (net income to sales, asset turnover, return on assets, sales growth, and market-to-book) for stock versus cash mergers. The mean industry-adjusted net income to sales, asset turnover, return on assets, sales growth, and market-to-book over the three years after the first consolidated financial statement published are used to measure the post-merger performance. $T$-statistics corresponding to the difference in the means and the Z-statistics corresponding to the difference in the medians are shown in parentheses.

| | Total Sample | | Cash | | Stock | | Differences | |
|---|---|---|---|---|---|---|---|---|
| | Mean | Median | Mean | Median | Mean | Median | Mean | Median |
| *Post-Merger Performance* | | | | | | | | |
| NI/Sales | 0.066 | 0.042 | 0.072 | 0.042 | 0.063 | 0.042 | 0.009 | 0.000 |
| | N=167 (100%) | | N=61 (37%) | | N=106 (63%) | | (0.639) | (-0.256) |
| ATO | -0.136 | -0.153 | -0.185 | -0.200 | -0.116 | -0.078 | -0.069 * | -0.122 ** |
| | N=163 (100%) | | N=48 (29%) | | N=115 (71%) | | (-1.796) | (-2.165) |
| ROA | 0.067 | 0.038 | 0.093 | 0.065 | 0.053 | 0.020 | 0.040 *** | 0.045 |
| | N=174 (100%) | | N=61 (35%) | | N=113 (65%) | | (2.634) | (1.536) |
| Sales Growth | -0.015 | -0.022 | 0.001 | 0.002 | -0.024 | -0.031 | 0.025 | 0.033 |
| | N=174 (100%) | | N=59 (34%) | | N=115 (66%) | | (1.458) | (1.042) |
| M/B | 1.134 | 0.907 | 1.57 | 0.961 | 0.890 | 0.864 | 0.680 *** | 0.097 |
| | N=159 (100%) | | N=57 (36%) | | N=102 (64%) | | (3.210) | (0.265) |

***Significant at 1% level; **Significant at 5% level; *Significant at 10% level.

## 6. Conclusion

The direct effects of CEO behavior, period of merger, method of payment, industry of merged firms, premiums paid to the target firms, and post-merger operating performance on the likelihood of CEO turnover amongst bidding firms have been investigated in this study. The results of this study indicate that CEOs' behavior—assessed with three measures—and the premiums paid to target firms generally have insignificant effects on CEO turnover. On the other hand, the effect of the period of merger on CEO turnover is positive and significant, meaning that CEOs who undertake merger during the waves face a higher probability of being replaced. These CEOs are more likely to be disciplined because the post-merger operating performance they produce is not significantly better than their pre-merger operating performance even though the post-merger operating performance they generate is significantly higher than that created by CEOs who undertake merger outside the waves. Stated differently, CEOs who undertake merger outside the waves perform better than those who conduct merger during the waves.

The other significant result of this study is that the method of payment has a positive and significant effect on CEO turnover. This means that CEOs who use stock as a method of payment are more likely to be replaced. This result does not support the prediction which is based on the argument that stock mergers serve the interest of long-term share-

holders of the bidders (Shleifer and Vishny 2003).It is found that these CEOs are more likely to be replaced because the post-merger return on assets and the post-merger market-to-book they generate are poorer than those produced by their counterpart in cash merger. It is also possible that these CEOs may obtain private, non-pecuniary benefits from control and acquisitions that does not benefit shareholders.

This study also indicates that the interaction between the merger period and the premium paid to target firms significantly affect the likelihood of a CEO turnover and, hence, it can be deduced that CEOs who undertake merger during the waves and pay higher premiums to the targets are also more likely to be disciplined. Additionally, in general, bidder CEOs are more likely to be replaced due to the poorer operating performance they generate following the mergers. A tendency that these disciplined CEOs have a better operating performance prior to the mergers is also present in the result of the logit test.

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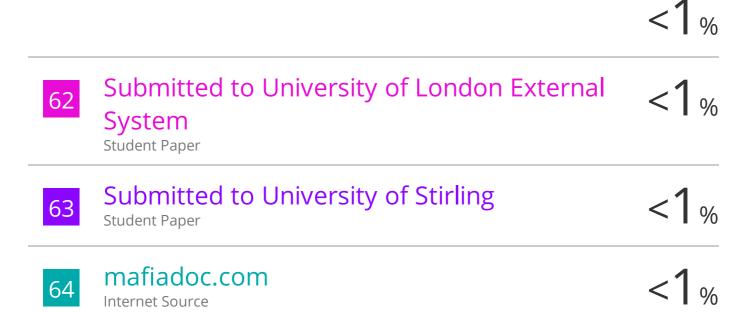Publication
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