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WHAT DRIVES DAMAGE ON POST-MERGER OPERATING PERFORMANCE?

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This study examines whether bidders' post-merger operating performance are affected by their CEO behavior, premiums paid to the target firms, the period of mergers, the method of payment, the industry of merged firms, capital liquidity, and their pre-merger operating performance. Testing the U.S. successful merger and acquisition data for the period of 1990s, this study finds that in-wave mergers, intra-industry mergers, the payment of lower premiums, and better pre-merger operating performance drive the bidders to produce better post-merger operating performance. Three measures of CEO behavior—the main predictor scrutinezed in this study—are proposed and examined, and the results demonstrate that the effects of these measures on post-merger operating performance are mixed, suggesting that each of the behavioral measures designed in this study may capture CEO behavior in different ways.

Keywords: capital liquidity; CEO overconfidence; merger waves, method of payment operating performance

Introduction

The results of the tests on post-merger operating performance indicate that performance following mergers undertaken during the wave period is worse than that during other periods Soegiharto (2008). On the other hand, Harford's (2005) study does not find evidence that performance following the wave period mergers is worse than that during other periods. Instead, post-merger changes in sales growth are significantly greater inside the waves. While the findings by earlier studies are consistent with the behavioral explanation of merger waves, the results of latter studies are in line with the neoclassical explanation of merger waves. This suggests that both the neoclassical and the behavioral explanation of merger waves have some supports.

The aim of this study is to examine whether there is a difference in post-merger operating performance between mergers occurring during merger waves and those outside the waves, between mergers undertaken by overconfident and those by less overconfident CEOs, between stock and cash mergers, between within and cross-industrial mergers, and between mergers conducted in a high and those in a low liquidity year. Moreover, this study also investigates whether five variables—CEO overconfidence, merger period, payment method, the industry of merged firms, and capital liquidity—and premium paid to the target firm predict post-merger operating performance.

This study re-examines the relationship between post-merger operating performance and payment method used to finance the merger, and also between post-merger operating performance and the industry of merged firms since empirical evidence on these relationships are mixed and researchers of the previous studies did not take into account merger waves and CEO overconfidence in their analyses (see e.g., Ghosh 2001; Healy et al. 1992; Heron and Lie 2002; Linn and Switzer 2001). The findings of this study indicate that merger period and the industry of merged firms positively and significantly affect the post-merger operating performance. Additionally, the premium paid to target firms is negatively and significantly associated with post-merger operating performance. It is also found that the pre-merger performance has a positive and significant effect on the post-merger performance. Eventually, CEO overconfidence, the variable of principal interest in this study, does not exert any effect on the post-merger operating performance.

The outline of this paper is as follows: Literature review and empirical predictions are presented in Sections 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.

Literature Review

Although merger and acquisition (M&A) must be pre-approved by a

firm's entire board of directors, it is widely recognized that the CEO initiates the M&A and oversees its progress. In other words, the CEO plays a central role in the M&A decision-making process (see e.g., Roll 1986; Shleifer and Vishny 1988). During the decision-making process, the CEO may be influenced by the time when the merger is undertaken (in-wave or non-wave), his or her own behavior (overconfident or not), the industry of the target firm (intra- or inter-industry), and the method of payment (stock or cash) to be used to complete the M&A. These factors, which potentially affect the bidder's post-merger operating performance, are examined in this study. This section provides the review of relevant literature on these factors and the variable that they might influence, which is the post-merger operating performance.

Post-Merger Operating Performance

A number of studies have investigated the changes in the long-term operating performance of acquiring and target firms using post-merger accounting and cash flow data. The results of those empirical studies are in general inconsistent. While some research indicates a significant improvement in the post-merger operating performance (e.g., Healy et al. 1992; Heron and Lie 2002; Switzer 1996), others document a significant decline in the operating performance following mergers (e.g., Clark and Ofek 1994; Kruse et al. 2002). In addition, some other studies reveal insignificant changes in the post-merger operating performance (e.g., Ghosh 2001; Herman and Lowenstein 1988).

A study by Healy et al. (1992), which examined the operating performance of the 50 largest mergers between 1979 and 1983 and compared the post-merger performance to the pre-merger performance of the merging firms, indicates that the merged firms' operating cash flows performance in five years after the mergers improve significantly relative to their industry averages, substantiating the conjecture that mergers are capable of improving operating performance. Employing the methodology of Healey et al. (1992), Switzer (1996) examined the changes in operating performance of firms involved in 324 acquisitions between 1967 and 1987. He verifies several Healy et al.'s (1992) findings and concludes, in particular, that the results of Healy et al. (1992) are robust to both sample size and the period of examination. Moreover, the results of Switzer's (1996) study indicate that the performance of the merged firms typically improves following their combination, which is consistent with that presented by Healy et al. (1992).

Similar to Healy et al. (1992), Andrade et al. (2001) also find that post-merger operating margin (cash flows to sales) on average strengthens relative to the industry benchmark. Specifically, they report the average abnormal operating performance, measured as the discrepancy between the

operating margin of combined firms and the median operating margin of corresponding industry. Their results suggest that the operating performance of the combined target and acquirer is strong relative to their industry peers preceding the merger, and slightly improves in the wake of the merger transaction. Also similar to Healy et al. (1992), Heron and Lie (2002) find that acquiring firms demonstrate greater operating performance relative to their industry counterparts prior to mergers and, consistent with Healy et al. (1992) and Switzer (1996), these firms continue to exhibit an operating performance level in excess of their respective industries following the mergers. Moreover, those firms significantly outperform control firms with comparable pre-event operating performance.

Clark and Ofek (1994) also analyze post-merger operating performance. However, their study was designed to specifically examine the effectiveness of mergers in restructuring distressed firms, and investigate some determinants of the success of those mergers (using EBITD deflated by sales revenues instead of market value of equity, as in Healy et al. (1992)). They collected a sample of takeovers undertaken to restructure distressed targets for the period between 1981 and 1988. They find that, unlike the mergers of healthy firms studied by Healy et al. (1992), the performance of bidders that acquire distressed targets tend to decline in the post-merger period.

Merger Waves and Post-Merger Operating Performance

Two general classes of explanations of merger waves are: (1) neoclassical model, where industries responding to shocks reorganize through M&As and thereby generate a clustering of merger activity (Harford 2005; Mitchell and Mulherin 1996); and (2) behavioral model, where rational CEOs take advantage of consistent pricing errors in the market to buy real assets with their overvalued stocks (Rhodes-Kropf and Viswanathan 2004; Shleifer and Vishny 2003). Under the first explanation, if the wave is an efficient response to economic shocks, it should be related to more rational behavior. Hence, it is expected that the improvement in post-merger operating performance for in-wave mergers is equal to or greater than that for non-wave mergers. This is more likely to occur as the bidder and the target merge for synergy (there is an economic rationale behind the merger).

Under the second explanation, bidder CEOs may make valuation errors and have an opportunity to pursue their own interests at the expense of shareholders during the merger waves since the shareholders may have a more difficult time analyzing the bidding firms during those waves. Therefore, according to this theory, the performance of bidders is relatively lower for mergers undertaken during the waves than those conducted outside the waves. In addition, the poor post-merger perfor-

mance in the market-misvaluation[1] mergers can also be explained by the fact that these mergers are not underlain by economic factors that could drive the merged firms to perform better.

None of the behavioral papers explicitly formulates predictions concerning operating performance. However, as explained above, one can derive a prediction that the costs of integrating two firms with no real combined synergy (and hence no operational motive to merge) would produce generally poor post-merger operating performance for in-wave mergers. Harford's (2005) tests of operating performance shows no evidence that the changes in actual performance following in-wave mergers are worse than those during other periods. Rather, he argues that the post-merger change in one of his measures of post-merger performance (sales growth) remains significantly greater inside the waves.

CEO Overconfidence and Post-Merger Operating Performance

CEOs are particularly likely to display overconfidence for three reasons. First, individuals are more overconfident about outcomes that they believe are under their control (Weinstein, 1980). Second, individuals are especially overconfident about outcomes to which they are highly committed (Weinstein, 1980). Third, overconfidence is likely to be strongest when the reference point is abstract (Alicke et al., 1995). Linking overconfidence to corporate finance, Roll (1986) advances the idea that in corporate takeovers, the overconfidence managers engage in M&As with an overly optimistic opinion of their abilities to create value. Similarly, Heaton (2002) shows that common distortions in corporate investments may be the result of managers overestimating the returns on their investments. These, in turn, often lead to bidding firms paying higher premiums for their targets. Roll also argues that the mistake of paying too much stems from management who overrate the synergistic gains from an M&A. Such overpayment is a principal mechanism by which hubris ultimately damages the operating performance following the M&A.

Method of Payment and Post-Merger Operating Performance

Empirical evidence suggests that the means of payment is an important determinant of the long-term post-acquisition performance: cash offers are associated with a stronger improvement than takeovers involving other forms of payment (Ghosh 2001; Linn and Switzer 2001; Moeller and Schlingemann 2004). A study by Healy et al. (1992), which examined the operating performance of the 50 largest merger transactions, reports that operating performance improves following the transactions. However, they do not

[1] Market-misvaluation merger is defined as a merger that results from managerial timing of market overvaluation of their firm.

find any relationship between post-merger operating performance and the method of payment utilized to finance the mergers. Heron and Lie (2002) also examined the relation between the method of payment in mergers and operating performance. Similar to Healy et al. (1992), they also find that the trends in industry-adjusted operating performance (before and after mergers) do not differ across cash mergers, stock mergers, and mixed (cash and stock) mergers. They subsequently suggest that the method of payment does not appear to convey information with respect to future operating performance. Likewise, Powell and Stark (2005) and Sharma and Ho (2002) find no significant relationship between the method of payment and post-merger operating performance.

As in Healy et al. (1992) and Heron and Lie (2002), Ghosh (2001) investigated the impact of the method of payment on the acquiring firms' post-merger operating cash flows. He included 50 largest acquisitions each year from 1981 to 1988, and adopted the methodology harnessed by Healy et al. (1992). Unlike Healy et al. (1992) and Heron and Lie (2002), Ghosh (2001) provides evidence that the combined firms' cash flows strengthen significantly following cash mergers but deteriorate subsequent to stock mergers. He argues that the improvement in cash mergers results from the increase in assets turnover (sales per dollar of assets) and the decline in stock mergers is due to a significant drop in the assets turnover.

Industry of Merged Firms and Post-Merger Operating Performance

The establishment of diversified firms is related to divisional managers who have rent-seeking behavior (Scharfstein and Stein 2000), bureaucratic rigidity (Shin and Stulz 1998), and a bargaining problem within the firm (Rajan et al. 2000). As these drawbacks may outpace the alleged synergies, the bidder CEOs may fail to enhance post-merger operating performance. Moreover, as suggested by Shleifer and Vishny (1989), diversifying mergers may be a consequence of the agency problems between managers and shareholders. This, in turn, may also produce the decline in corporate performance following the mergers. Several studies have been undertaken to examine these assumptions. While research conducted by Healy et al. (1992) and Heron and Lie (2002) confirms these assumptions, other studies done by Powell and Stark (2005), Linn and Switzer (2001), Switzer (1996) and Sharma and Ho (2002) find an insignificant relationship between diversifying mergers and poor post-merger operating performance. In addition, the study by Kruse et al. (2002) and Ghosh (2001) find evidence that the inter-industry mergers significantly outperform the intra-industry mergers.

Bid Premium and Post-Merger Operating Performance

It is generally acknowledged that additional value that can be extracted

from target firms by bidder CEOs are reflected in the premiums paid to the targets. Premium also emphasizes a bidder CEO's belief that the target's present performance is poor and that its stock price poorly reflects the value of the firm's resources and prospect. In addition, premium is important not only due to its function as the statement of pricing and the bidder's expectation, but also because of its effect on the ultimate merger performance (Hayward and Hambrick 1997).

Roll (1986) argues that the mistake of paying too much which stems from management overrating the value created and synergistic gains from an M&A ultimately damages the operating performance following the M&A. Contrary to this argument, McCauley (1997) examined whether the size of an acquisition premium is an important determinant of the ultimate success of the M&A, and finds no correlation between the percentage of premium paid and the "success" of the M&A based on an industry benchmark standard. Nevertheless, ceteris paribus, it is axiomatic that the higher the premium paid, the lower the ultimate operating performance to the acquirer in a given acquisition.

Empirical Predictions

This study examines the effects of the period of merger, CEO behavior, the method of payment, the industry of merged firms, and premiums paid to target firms on post-merger operating performance. For the interest of completeness, the impacts of liquidity period, CEO tenure, CEO stock ownership, pre-merger operating performance, free cash flows, and leverage are also tested.

Roll (1986) argues that bidder CEOs are infected by hubris (overconfidence). Their overconfidence may cause them to overestimate the values of target firms, overestimate their abilities to manage the targets and reap the gains/returns from the mergers, and thereby not to act in the best interests of shareholders. CEO hubris leads them to pay higher premiums, and accordingly those mergers are more likely to be negative NPV projects for the bidders. Hence, it is argued that CEO overconfidence and the payment of higher premium lead to poor post-merger operating performance.

The incidence and manifestation of CEO overconfidence are probably time varying. Bradley et al. (1988) note that multiple-bidding contests are more likely to occur during merger waves, and so during the wave period bidders are more likely to offer higher premiums as they are faced with greater competition. Even bidders who do not face open rivalry may pay higher premiums during the merger waves to forestall the possibility of other bidders entering the race. The bidder CEOs may also pay higher premiums during the merger waves as they are more inclined to make valuation errors. Therefore, it is conjectured that mergers undertaken during the merger waves

would result in poor post-merger operating performance.

Bidder CEOs may pay higher premiums for mergers that involve bidders and targets from different industries. This may occur since the bidder CEOs might only have little experience, limited capabilities, and insufficient knowledge of the targets' businesses, and, in turn, they may overvalue the targets. Bidders tend to use stocks to finance mergers when they believe their stocks are overvalued. As their stocks are overvalued, they are more readily available to pay higher premiums to the target firms. In addition, the bid premiums paid to the targets may be higher when capital liquidity is high. As the transaction costs are low (when the capital liquidity is high), the bidder CEOs may be more willing to pay more premiums to complete the mergers. Hence, it is more likely that inter-industry mergers, stock mergers, and mergers undertaken during the period of high liquidity would result in poor post-merger operating performance.

A CEO with long tenure logically has proven his or her skills in both good and bad times, and the board of directors should have already obtained almost all required information on him or her. As his or her tenure gets longer, he or she might have more control over the firm and has a stronger influence on the board. With this power in hand, CEOs tend to act not for the best interests of shareholders, and may destroy the values of mergers they undertake by paying higher premiums to the target firms in order to complete the mergers which may be part of their organizational strategy. On the other hand, since a merger typically results in a decrease in the acquirer's stock price, it follows that a CEO with more equity or whose pay is more heavily weighted towards equity-based incentives might be less likely to undertake an M&A or overpay the target firm. Therefore, CEOs with high stock ownership may have interests which are aligned with those of shareholders. For this reason, they may pay "fair" premiums in the mergers they execute. Hence, it is more likely that CEOs with longer tenure would produce poorer post-merger operating performance, and CEOs with higher stock ownership would generate better post-merger operating performance.

CEOs with better pre-merger performance may believe that their managerial abilities to run their firms successfully can be applied to firms they are acquiring. As they believe that the acquired firms' prospects will be better in their hands or they could bring more benefits to those firms, they would be very willing to incur high premiums. It is also convinced that CEOs with a high level of free cash flows and a low level of leverage will pay higher premiums. Mergers that involve these CEOs may also result in poor post-merger operating performance.

Predicated on the arguments discussed above, it is predicted that:

1. The post-merger operating performance: (a) of bidders with overconfident CEOs is poorer than that with less overconfident CEOs, (b) of

mergers undertaken during the in-wave period is poorer than that made during other (non-wave) periods, (c) of inter-industry mergers is poorer than that of intra-industry mergers, (d) of stock mergers is poorer than that of cash mergers, and (e) of mergers undertaken following a high liquidity year is poorer than that following a low liquidity year.

2. CEO overconfidence, in-wave mergers, stock overvaluation, higher bid premiums, higher capital liquidity, inter-industry mergers, better pre-merger performance, higher pre-merger free cash flows, lower pre-merger leverage, longer CEO tenure, and lower CEO stock ownership lead to the bidders' poor post-merger operating performance.

The two predictions formulated above are summarized in Table 1, and the empirical findings, discussed in Section 1.4, are also previewed in the table.

Data and Methods

Data

Data employed in this study are identical to those used in the study of Soegiharto (2010). They are collected from the Securities Data Company's (SDC) Mergers and Acquisitions database. The data gathered include the U.S. M&A transactions that took place during the period of January 1991 to December 2000. Sample selection criteria include: (1) the bidder and target firms are publicly traded and (2) the transaction value is at least US$60 million in 2005 dollars. These criteria result in an initial sample of 3,182 M&As. The financial and stock price data for merged companies are extracted from the Standard and Poor's COMPUSTAT Research Tape (COMPUSTAT) and the Center for Research in Security Prices (CRSP) databases, respectively. The requirement that all sample firms be listed on these two databases reduces the sample size to 729 mergers. The data on sample CEOs are collected from the Execucomp database. The database provides comprehensive information on various aspects of CEOs, such as the dates they were appointed, option packages including expiration dates and exercise prices, and CEOs' share ownership. However, the information on options held by a CEO until the year of expiration–which is used as the proxy for CEO overconfidence–is available only for the CEOs of acquiring firms in 294 M&As. Thus, there is a large drop in sample size.

Table 1. **Predictions and Findings for the Drivers of Poor Post-Merger Operating Performance**

Predictors		The Means of and the Predictors Effect on Post-Merger Operating Performance			Remark
		Predictions	Univariate Findings	Multivariate Findings	
CEOs' Behavior	Overconfident	Lower[u]; Poorer[m]	Mixed	Insignificant	The means significantly and insignificantly differ[u]
Period of Merger	In-Wave Merger	Lower[u]; Poorer[m]	Generally significantly higher	Generally significantly better	—
Merged Firms' Industry	Inter-Industry Merger	Lower[u]; Poorer[m]	Generally insignificant	Significantly poorer	Except on market-to-book[m]
Method of Payment	Stock	Lower[u]; Poorer[m]	Generally significantly lower	Insignificant	—
Capital Liquidity	Year of High Liquidity	Lower[u]; Poorer[m]	Generally significantly higher	Insignificant	—
Premiums Paid	Higher	Poorer[m]	—	Significantly Poorer	Except on market-to-book[m]
Pre-Merger Performance	Better	Poorer[m]	—	Significantly Better	—
Pre-Merger FCF	Higher	Poorer[m]	—	Insignificant	—
Pre-Merger Leverage	Lower	Poorer[m]	—	Insignificant	—
CEOs' Ownerships	Lower	Poorer[m]	—	Insignificantly Poorer	Except on market-to-book[m]
CEOs' Tenure	Longer	Poorer[m]	—	Insignificant	—

[u] = Univariate prediction and evidence; [m] = Multivariate prediction and evidence

Measures of Overconfidence

This study uses measures of CEO overconfidence designed by Soegiharto (2010) who formulates the measures based on several variables extracted from the Execucomp database. Since information on options held by the CEO until the year of expiration is available only for a small number of CEOs, it is not possible for Soegiharto (2010) and also this present study to apply Malmendier and Tate's (2003) method, which collects the sample of CEOs from Hall and Liebman's data (1989) and classifies a CEO as overconfident when he or she holds stock options until the last year before expiration. Soegiharto (2010) proposes several measures of CEO overconfidence gauged prior to the year of merger announcement. He argues that as his measures of CEO overconfidence are assessed prior to merger announcement, they may better reflect the CEO overconfidence in undertaking M&As. The measures of CEO overconfidence employed by Soegiharto (2010) and applied in this study are listed below (the Execucomp's accessed items presented in italic)[2]:

1. Measure A. The 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. The 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.
3. Measure C. CEO behavior is measured using the net average value realized from exercising options (*soptexer*/*soptexsh*) and the average value the CEOs would have realized 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 overconfident if *inmonex*/*uex-*

[2] Initially, Soegiharto's study (2010) proposes five measures of CEO behavior. The association among 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 measures, except for Measure 1 which has no association with Measure 2 (Pearson statistic = 0.012, significance = 0.911), and for Measure 2 (then renamed as Measure B) 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 since the contingency coefficient from the symmetric measures indicates a value of 0.380 with a significance of <0.001, suggesting 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.

numex is greater than *soptexer*/*soptexsh*.

CEO overconfidence is a dummy variable that takes the value of one for an overconfident CEO and zero for a less overconfident CEO.

Identification of Merger Waves

Soegiharto (2008) and Soegiharto (2010) followed 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 various sectors are assigned to their own industries. For each industry, the highest concentration of completed and uncompleted 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 confirm a potential wave as an actual wave, the following simulation procedure is followed to construct the distribution of merger concentrations that facilitates the 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 1,000 times. Subsequently, the highest concentration of merger activity within a 24-month period from each of the 1,000 draws is calculated. The actual concentration of activity from the potential wave is compared with 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 merger simulation in the study of Soegiharto (2008) is 28 waves. He indicates that the average number of bids during the 24-month wave period over the 10-year sampling period is 53 whereas the average number of bids during the 24-month non-wave period is 14.3. This present study employs the identical waves identified in the study of Soegiharto (2008). 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 waves.

Measure of Bid Premium

Similar to Soegiharto (2010), 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 information on the merger. 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's shareholders. Bid premium 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 target share 30

days prior to the first bid announcement.

Measures of Operating Performance

Similar to Harford (2005), this study employs a set of measures of operating performance, which consist of net income [A172] to sales [A12], assets 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 while 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.

Results

Univariate Tests

To test Prediction 1, this study compares the means of post-merger operating performance of five of the following dummy variables (1 and 0 indicate the value taken): (i) bidders with overconfident (1) and less overconfident (0) CEOs, (ii) in-wave (1) and non-wave (0) mergers, (iii) intra- (1) and inter- (0) industry mergers, (iv) stock (1) and cash (0) mergers, and (v) mergers undertaken following a high liquidity year (1) and a low liquidity year (0). The redundant (highly correlated) measures of operating performance are removed using the principal component analysis. Post-merger operating performance is assessed using the return on assets, net income to sales, and/or market-to-book ratio. A high liquidity year is the year in which the rate spread is below its time-series median and the industry's market-to-book ratio is simultaneously above its time-series median. The low liquidity years are all other years.

As presented in Table 2, the results of the independent sample *t-test* (Prediction 1a) are mixed. When Measure A is used as the proxy for CEO overconfidence, the findings indicate that the means of post-merger return on assets (see Panel A) and post-merger net income to sales (see Panel B) are significantly higher for mergers undertaken by less overconfident CEOs than those executed by overconfident CEOs. When Measure B is employed, the significant difference (at 10% level) is only present for post-merger return on assets, implying that the overconfident CEOs outperform the less overconfident CEOs (see Panel A). The most consistent results are yielded by Measure C (see Panels A, B, and C).

Table 2. **The Difference in the Means of Post-Merger Operating Performance**

The means are for the following classifications of merger: mergers undertaken by overconfident and less overconfident CEOs, mergers conducted during merger waves and outside the waves, mergers that involve bidders and targets from the same and different industries, mergers that use stock and cash as method of payment, and mergers conducted following the year of high and low liquidity. Measure A, Measure B, and Measure C are used as measures of CEOs' behavior. The differences in numbers of observation are due to the missing data and only significant results are presented.

(Panel A) The difference in the means of post-merger return on assets (ROA)

		Return on Assets						
		N	**Mean**	**SD**	**SE Mean**	**Mean Diff.**	**SE Diff.**	**Sig. (2-tailed)**
CEOs' Behavior (Measure A)`	Less Overconfident	86	0.053	0.094	0.010	0.025	0.010	**0.017**
	Overconfident	126	0.029	0.057	0.005			
CEOs' Behavior (Measure B)	Less Overconfident	63	0.026	0.049	0.006	-0.019	0.011	**0.085**
	Overconfident	174	0.045	0.082	0.006			
CEOs' Behavior (Measure C)	Less Overconfident	120	0.031	0.076	0.007	-0.039	0.011	**0.000**
	Overconfident	134	0.070	0.095	0.008			
Payment Method	Cash	61	0.093	0.108	0.014	0.040	0.015	**0.009**
	Stock	113	0.053	0.088	0.008			
Liquidity	Year of High Liquidity	153	0.063	0.081	0.007	0.054	0.012	**0.000**
	Year of Low Liquidity	47	0.009	0.038	0.006			

(Panel B) The difference in the means of post-merger net income to sales (NIS)

		Return on Assets						
		N	**Mean**	**SD**	**SE Mean**	**Mean Diff.**	**SE Diff.**	**Sig. (2-tailed)**
CEOs' Behavior (Measure A)	Less Overconfident	80	0.071	0.091	0.010	0.031	0.011	**0.006**
	Overconfident	135	0.040	0.073	0.006			
CEOs' Behavior (Measure C)	Less Overconfident	109	0.038	0.059	0.006	-0.022	0.010	**0.031**
	Overconfident	129	0.060	0.089	0.008			
Merger Period	Non-Wave Mergers	172	0.042	0.062	0.005	-0.026	0.011	**0.026**
	Wave Mergers	69	0.067	0.113	0.014			

Continued from Table 2

(Panel C) The difference in the means of post-merger market-to-book (M/B)

		Return on Assets						
		N	**Mean**	**SD**	**SE Mean**	**Mean Diff.**	**SE Diff.**	**Sig. (2-tailed)**
CEOs' Behavior (Measure C)	Less Overconfident	104	0.428	0.745	0.073	-0.940	0.164	**0.000**
	Overconfident	134	1.368	1.543	0.133			
Merger Period	Non-Wave Mergers	160	0.784	0.935	0.074	-0.565	0.181	**0.002**
	Wave Mergers	78	1.349	1.853	0.210			
Industry of Merged Firms	Inter-Industry	106	1.612	1.868	0.181	0.992	0.180	**0.000**
	Intra-Industry	140	0.621	0.886	0.075			
Payment Method	Cash	56	1.616	1.614	0.216	0.725	0.211	**0.001**
	Stock	102	0.890	1.032	0.102			
Liquidity	Year of High Liquidity	133	0.946	0.941	0.082	0.698	0.140	**0.000**
	Year of Low Liquidity	53	0.248	0.611	0.084			

The differences in the means of the three measures of post-merger operating performance employed are significantly higher for overconfident CEOs than for less overconfident CEOs, which correspond with the results of Measure B in Panel A. However, these results are in conflict with those in Panel A (return on assets) and Panel B (net income to sales) when Measure A is used. These conflicting results, which generally do not support Prediction 1a, are prevalent since the measures of CEO overconfidence employed in this study may capture the CEO overconfidence in different ways.

Up to this point, in general, the results of the tests indicate that the less overconfident CEOs are more likely to generate poorer post-merger operating performance than the overconfident CEOs. This finding is in line with that of Soegiharto (2010) that the less overconfident CEOs pay higher premiums than do the overconfident CEOs. Perhaps, the less overconfident CEOs who pay higher premiums overestimate the value they can create from the mergers, and do not use their resources optimally following the mergers. As a result, they generate poor post-merger operating performance.

The other results in Table 2 demonstrate that the means of post-merger net income to sales (see Panel B) and the means of post-merger market-to-book (see Panel C) for in-wave and non-wave mergers are significantly different. The means of these two measures of performance are higher for in-wave mergers than for non-wave mergers. These results, which

do not confirm Prediction 1b, may occur as there are many targets available during merger waves, and bidders could choose targets that are most favorable to them and, ultimately, they could produce better post-merger operating performance.

For mergers that involve bidders and targets from the same or different industries, a significant difference only appears in the means of post-merger market-to-book (see Panel C). The means of this measure is higher for inter-industry mergers than for intra-industry mergers. This evidence, which does not support Prediction 1c, suggests that bidders that acquire targets from different industries may have an opportunity to take advantage from conglomeration, for instance, by bringing down the level of their exposure to risks.

The means of post-merger return on assets (see Panel A) and post-merger market-to-book (see Panel C) are significantly different for mergers financed with stock and those with cash, and for mergers undertaken following a year of high liquidity and those following a year of low liquidity. The means of these two measures of performance are higher for cash mergers than for stock mergers (supporting Prediction 1d) but are also higher for mergers undertaken following the year of high liquidity than those conducted following the year of low liquidity (Prediction 1e is not substantiated). The finding that stock mergers produce poorer post-merger operating performance relative to cash mergers is consistent with the argument that bidder CEOs are more likely to pursue their personal interests at the expense of shareholders. Meanwhile, the finding that mergers undertaken following the high liquidity years generate better post-merger operating performance may be due to the bidder CEOs' better access to the sources of funds to accommodate the reallocation of assets efficiently.

Multivariate Tests

CEO overconfidence, merger period, premium paid to the target firm, the method of payment, the industry of merged firms, capital liquidity, pre-merger operating performance, pre-merger free cash flows, pre-merger leverage, CEO tenure, and CEO stock ownership are variables that may affect the bidders' post-merger operating performance (Prediction 2). Pre-merger performance includes net income to sales, assets turnover, return on assets, sales growth, and market-to-book ratio. Free cash flow is calculated as operating income – (taxes + interest + preferred dividend + common dividend), and leverage is calculated as long-term debt divided by book value of equities. The difference between the date an individual becomes a CEO and the date the merger announced is used to determine the CEO tenure. The number of shares owned by a CEO is divided by the number of shares outstanding to obtain the CEO stock ownership.

It is generally acknowledged that the extra value that can be extracted from the target firms by the bidder CEOs are reflected on the premiums paid to the targets. Hayward and Hambrick (1997) argue that premium is important not only on account of its function as the statement of pricing and the bidder's expectation, but also due to its effect on post-merger operating performance. Similarly, Roll (1986) reveals that the mistake of paying too much, stemming from management who overrate the value created and synergistic gains from an M&A, ultimately damages the operating performance following the M&A. This argument implies that the bidders' poor post-merger performance may be driven by the high premiums they have paid to the target firms. Prior to the test of Prediction 2, this study examines this relation using the regression analysis and employs the following measures of post-merger performance: net income to sales, assets turnover, return on assets, sales growth, and market-to-book ratio. The results of the regression analysis, as presented in Table 3, indicate that the amount of premiums paid do not exert any effect on the bidders' post-merger operating performance.

It is hypothesized that the relationship between the amount of premiums paid and the post-merger operating performance may be affected by CEO behavior, merger period, the method of payment, and the industry of merged firms. However, as there is not any relationship between the premiums paid and post-merger operating performance, it is not possible to test the indirect effect of the four influencing factors mentioned on the relationship between the two variables. This paper,

Table 3. **Predicting Post-Merger Operating Performance Using Premiums Paid to Targets**

	Net Income to Sales	Assets Turnover	Return on Assets	Sales Growth	Market-to-Book
Intercept	0.067 [0.000]	-0.042 [0.292]	0.025 [0.000]	-0.033 [0.083]	1.408 [0.000]
Premiums Paid	-0.027 [0.158]	-0.112 [0.115]	0.004 [0.874]	0.037 [0.281]	0.169 [0.682]
Adjusted R^2	0.004	0.006	0.263	0.001	-0.003
SE of the Estimate	0.087	0.350	0.086	0.167	1.989
p-value for *F*-test	0.158	0.115	0.000	0.281	0.682
Number of observations	258	258	258	258	258

therefore, investigates the direct effect of the explanatory variables employed on the post-merger operating performance. As the post-merger performance is measured using several variables, the redundant (highly correlated) variables are removed using the principal component analysis. This analysis indicates that post-merger performance is best assessed by return on assets (which has the highest score in the component matrix), net income to sales, and/or market-to-book ratio.

Although the results in Table 3 do not show any effect of premiums paid on post-merger operating performance, it remains sensible to test the influence of variables on the premiums paid to the targets firms. These variables, collectively, may also affect the bidders' post-merger operating performance.

The Effects of the Combination of Measures of CEO Behavior and Classified Predictors on Post-Merger Performance

Firstly, in the multivariate tests, this study individually regresses thirteen predictors (see Appendix 1) on return on assets (Panel A), net income to sales (Panel B), and market-to-book (Panel C). *Secondly*, each of the measures of CEO overconfidence (three of the predictors used) is added to the other individual predictors employed to construct new regression models. The results of these two tests are discussed along with the results of the third test (this section). Tables for the results of the first two tests are not presented, but are available upon request.

In the third test, the predictors are classified into four groups: (1) accounting number factors, (2) financing factors, (3) merger factors, and (4) CEO factors (other than CEO behavior). In the discussion, the results of this test are compared to those of the first and the second tests. In Model A, Model B, and Model C, each of the measures of CEO overconfidence is added to each of the groups constructed. As presented in Appendix 1, the results—compared to those in the first and the second tests—indicate that the pre-merger leverage remains a variable that negatively and significantly affects return on assets, net income to sales, and market-to-book (see Panel A, Panel B, and Panel C). In Panel A of Appendix 1, capital liquidity remains a significant predictor in Model A2 only, which is consistent with the findings in the first and the second tests. The effect of capital liquidity in Model B2 and Model C2 in Panel A of Appendix 1 is not consistent with the results of the first and the second tests. For the method of payment, the effect remains significant only in Model C2 in Panel A of Appendix 1, which is consistent with results of the first and the second tests.

The effect of the industry of merged firms, which has a significant effect on return on assets in the second test, is no longer significant (see Model B3, Panel A, Appendix 1). Similar to the results of the second test, those in Model A in Panel A of Appendix 1 indicate that the overconfident CEOs are more likely to produce poorer post-merger return on assets. On the other

hand, in Model C (Panel A, Appendix 1), the overconfident CEOs are more likely to generate better post-merger return on assets. Nevertheless, only Model A2, Model C3, and Model C4 (Panel A of Appendix 1) show significant effects on the dependent variable examined.

In Panel B of Appendix 1, the effects of the period of merger and CEO ownership on post-merger net income to sales are not significant, which are unlike the effects obtained from the first and the second tests. The results of the effect of CEO overconfidence on post-merger net income to sales in Model A (Panel B, Appendix 1) indicate that the overconfident CEOs are more likely to produce poorer post-merger net income to sales. In contrast, in Model C (Panel B, Appendix 1), the overconfident CEOs are more likely to produce better post-merger net income to sales. The significant models include Models A2 to A4, and Model C4 (see Panel B, Appendix 1). These results are similar to those emerge in the first and the second tests.

In Panel C of Appendix 1, the effect of pre-merger free cash flows on post-merger market-to-book ratio in all models (Model 1, Model A1, Model B1, and Model C1) is significant. These results are parallel with those from the second test. However, the coefficient on this predictor is close to zero, meaning that the impact is economically unimportant. Capital liquidity also remains a significant predictor in all models (Model 2, Model A2, Model B2, and Model C2), which is also consistent with the results of the second test. Similarly, the result for the industry of merged firms in Model C3, Panel C, Appendix 1 is also in line with that in the second test, i.e., it significantly and negatively affects the dependent variable.

For CEO overconfidence, the results presented in Model A1, Panel C, Appendix 1 indicate that the overconfident CEOs generate poorer post-merger market-to-book. In contrast, the results presented in Model C3 and Model C4 in the same panel and table demonstrate that the overconfident CEOs produce better post-merger market-to-book. They are consistent with the findings in the first and the second tests. This may occur as overconfident CEOs pay less amount of premiums to the target firms (see Soegiharto 2010), and perhaps because they are convinced that they estimate the values of the targets correctly. The results of CEO stock ownership indicate that the effect of this variable on post-merger market-to-book, in Model 1 and Model A1, is significantly negative. In addition, the results of CEO tenure, in all models, indicate a positive and significant impact of this variable on post-merger market-to-book. In the second test, these last two predictors, however, show no significant effect on the dependent variable.

As shown in Appendix 1 (and also the results from the second test), there is conflicting evidence concerning the effect of CEO overconfidence on the post-merger performance. On one

hand, when Measure C is employed, the results in general exhibit that CEO overconfidence significantly and positively affects each of the three post-merger performance measures. On the other hand, when Measure A is used, the results also demonstrate a significant but negative effect of CEO overconfidence on each of the dependent variables employed. Additionally, when Measure B is used, none of CEO overconfidence significantly affects the measures of post-merger performance. These findings suggest that each of the measures of CEO behavior may capture CEO overconfidence differently.

It is argued that Measure A—classifying a CEO as overconfident if the percentage of options he or she exercises is smaller than both the annual average percentage and industry-year average percentage—better gauges the CEO overconfidence as holding options until certain date, indicating the CEO conviction that his or her company will perform better and its stock price will increase further. In addition, the comparison with the annual average percentage and the industry-year average percentage enhances the validation of this measure. Measure B only focuses on the increase in the number of shares the CEO owns (irrespective of whether he or she exercises the options). Ignoring the exercising/unexercising of stock options may weaken this measure. On the other hand, Measure C disregards the increase in the number of shares owned by the CEO, and the CEO is classified as overconfident if the average value that the CEO would have realized at year end—if he or she had exercised all of the vested options that had an exercise price below the market price—is greater than the net average value realized from exercising the options. This measure is valid to gauge individual CEO overconfidence, but it is not as robust as Measure A since it does not take into account the annual average difference and the industry-year average difference. Hence, it is concluded that the findings that indicate a negative and significant effect of CEO overconfidence on post-merger operating performance support the prediction developed.

The Effects of the Combination of Measures of CEO Behavior and Groups of Classified Predictors on Post-Merger Performance

In the final regression analysis, the groups of predictors are combined into several models, and these combined groups are regressed on each of the dependent variables employed (see Appendix 2). Each measure of CEO overconfidence, i.e., Measure A, Measure B, and Measure C, is added into Model A, Model B, and Model C, respectively. In the full model, the premiums paid to the target firms and each of the measures of pre-merger performance are also included as predictors. As can be seen in Appendix 2, in general, the results indicate that pre-merger leverage, the method of payment, and capital liquidity no longer significantly affect each of the three dependent variables. On the contrary,

the industry of merged firms becomes a variable that positively and significantly affects post-merger return on assets and post-merger net income to sales (see Panel A and Panel B). This suggests that intra-industry mergers lead to better post-merger performance, substantiating the conjecture made and consistent with the finding of Heron and Lie (2002) that operating performance improvement is significantly greater when the bidder and the target firm belong to the same industry.

The premiums paid to the target firms, included in the full model, also becomes a factor that negatively and significantly explains return on assets and net income to sales (see Panel A and Panel B). These findings mean that the higher the premiums paid, the lower the post-merger performance, supporting the prediction made. The results are also in line with Roll's (1986) study which finds that the payment of higher premiums to the target firms damages the performance following the mergers. In addition, pre-merger free cash flows, in general, also become a factor that positively and significantly affects the post-merger return on assets and the post-merger market-to-book (see Panel A and Panel C). However, the coefficient on this predictor is close to zero, suggesting that the effect of this predictor is economically unimportant.

The period of merger is also a variable that generally has a positive and significant impact on the three dependent variables employed (see the full model). This suggests that in-wave mergers lead to better post-merger performance, which does not support the hypothesis. It can also be seen in Appendix 2 that pre-merger return on assets, pre-merger net income to sales, and pre-merger market-to-book have positive and significant effects on post-merger return on assets, post-merger net income to sales, and post-merger market-to-book, respectively (see the full model). This proves that the higher the bidders' pre-merger performance, the better their post-merger performance will be. Finally, as shown in all panels of Appendix 2, CEO behavior, in general, has no effect on post-merger performance.

Conclusion

In this study, the tests on the differences in post-merger operating performance for M&As undertaken by overconfident and less overconfident CEOs, for in-wave and non-wave mergers, for stock and cash mergers, for within and cross-industrial mergers, and for mergers undertaken in a high and a low liquidity year are conducted. Moreover, the investigation on whether these five variables—CEO behavior, merger period, the method of payment, the industry of merged firms, and liquidity period—plus premiums paid to the target firms, affect post-merger operating performance is also performed.

In some models employed, CEO overconfidence—the major predictor examined in this study—has a conflicting effect on the post-merger operating performance. On one hand, when Measure C is employed, the results of the tests, in general, indicate that CEO overconfidence significantly and positively affects the post-merger performance. On the other hand, when Measure A is used, the results of the tests, overall, also demonstrate a significant but negative effect of the CEO overconfidence on the post-merger performance. When Measure B is used, however, none of CEO overconfidence significantly affects the measures of post-merger performance. These confirm the mixed findings in the univariate tests conducted. Overall, the findings suggest that each of the behavioral measures designed in this study may capture CEO overconfidence in different ways. Therefore, a better measure needs to be designed, and its effect on post-merger performance needs to be re-examined by future researchers.

The result for the period of merger generally indicates that mergers undertaken during merger waves have a positive and significant effect on the post-merger operating performance. This basically means that in-wave mergers lead to better post-merger operating performance, this may occur as there are many targets available during the merger waves and bidders could choose one which is the most favorable to them. This, in turn, will result in better post-merger operating performance for the merged firms. This finding is also consistent with that in the univariate tests.

Another result of this study indicates that the industry of merged firms, in general, positively and significantly affects the post-merger operating performance, implying that intra-industry mergers lead to better post-merger performance. This evidence is perhaps caused by the fact that managing a focused firm is relatively less difficult than managing a diversified firm, and the bidder CEO might already have better experience and knowledge of the target's businesses. The result of univariate tests, however, does not show any significant difference in the post-merger operating performance between intra- and inter-industry mergers.

The result of regression analysis also demonstrates that the premiums paid to the target firms negatively and significantly affect the post-merger operating performance. This finding suggests that the higher the premiums paid, the lower the post-merger operating performance will be. Stated differently, by paying high premiums, the bidder CEOs destroy the value of the mergers. It is argued in this study that the poor post-merger operating performance may result from the bidder CEO overconfidence. Overconfident CEOs may overestimate the values of target firms, and their overconfidence may lead them to pay higher premium to the targets. Such payment of higher premiums ultimately damages the performance following the mergers.

In addition, the results of this study shows that the pre-merger operating performance generally has a positive and significant effect on the post-merger operating performance. This finding indicates that bidders with higher pre-merger operating performance are more likely to generate better post-merger operating performance. In summary, this study provides evidence that mergers undertaken outside the waves, inter-industry mergers, the payment of higher premiums, and poor pre-merger operating performance lead to the bidders producing poor post-merger operating performance.

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Appendix 1. **Predicting Post-Merger Operating Performance Using Each of Measures of CEOs' Behavior and Classified Predictors**

The predictors employed in the regression analysis are classified as follows: accounting numbers factors that consist of free cash flows and leverage, financing factors that consist of method of payment and capital liquidity, merger factors that comprise the period of merger and the industry of merged firms, and CEOs factors that contain CEO tenure and CEO stock ownerships. Measure A, Measure B, and Measure C are used in Model A, Model B, and Model C, respectively, as measures of CEOs' behavior.

(Panel A) Predicting post-merger return on assets (ROA)

	Without Measure of CEOs' Behavior				*With Measure A (Model A)*				*With Measure B (Model B)*				*With Measure C (Model C)*			
	1	**2**	**3**	**4**	**A1**	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**
Intercept	0.075	0.107	0.049	0.048	0.081	0.104	0.044	0.070	0.080	0.115	0.031	0.069	0.066	0.094	0.039	0.033
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.002]
Pre-Merger FCF	0.000				0.000				0.000				0.000			
	[0.105]				[0.154]				[0.102]				**[0.092]**			
Pre-Merger Lev.	-0.105				-0.083				-0.103				-0.104			
	[0.001]				**[0.007]**				**[0.001]**				**[0.001]**			
Method of Payment		-0.019				-0.011				-0.017				-0.028		
		[0.298]				[0.418]				[0.339]				**[0.085]**		
Capital Liquidity		-0.021				-0.060				-0.022				-0.007		
		[0.336]				**[0.003]**				[0.315]				[0.719]		
Period of Merger			0.006				0.001				0.002				0.004	
			[0.594]				[0.951]				[0.854]				[0.700]	
Firms' Industry			-0.015				-0.007				-0.010				-0.015	
			[0.155]				[0.440]				[0.209]				[0.138]	
CEO Stock Ownerships				0.062				0.008				0.007				0.008
				[0.098]				[0.303]				[0.335]				[0.269]
CEO Tenure				0.000				0.000				0.000				0.000
				[0.476]				[0.923]				[0.802]				[0.562]
CEOs' Behavior					-0.023	-0.035	-0.011	-0.016	-0.009	-0.013	0.002	-0.019	0.016	0.009	0.023	0.045
					[0.200]	**[0.012]**	[0.234]	[0.256]	[0.640]	[0.494]	[0.853]	[0.198]	[0.382]	[0.543]	**[0.021]**	**[0.000]**
Adjusted R^2	0.065	0.000	0.001	0.004	0.057	0.104	-0.003	-0.002	0.061	-0.004	-0.007	0.001	0.064	0.002	0.018	0.059
SE of the Estimate	0.114	0.105	0.078	0.085	0.104	0.072	0.065	0.100	0.114	0.105	0.059	0.099	0.114	0.092	0.077	0.087
p-value for *F*-test	0.002	0.379	0.341	0.254	0.012	0.001	0.513	0.483	0.006	0.493	0.657	0.345	0.004	0.347	0.058	0.001
Number of obs.	156	150	243	189	138	117	201	216	156	150	214	231	156	144	243	226

(Panel B) Predicting post-merger net income to sales (NIS)

	Without Measure of CEOs' Behavior				*With Measure A (Model A)*				*With Measure B (Model B)*				*With Measure C (Model C)*			
	1	**2**	**3**	**4**	**A1**	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**
Intercept	0.039	0.072	0.049	0.064	0.056	0.093	0.073	0.082	0.040	0.036	0.041	0.060	0.035	0.077	0.045	0.050
	[0.001]	[0.000	[0.000	[0.000	[0.001	[0.000	[0.000	[0.000	[0.008	[0.020	[0.000	[0.000	[0.015	[0.000	[0.000	[0.000
Pre-Merger FCF	0.000				0.000				0.000				0.000			
	[0.181]				[0.205]				[0.181]				[0.174]			
Pre-Merger Lev.	-0.046				-0.053				-0.046				-0.046			
	[0.067]				**[0.053]**				**[0.074]**				**[0.067]**			
Method of Payment	-0.003				-0.001				-0.001				0.000			
		[0.852]				[0.955]				[0.936]				[0.988]		
Capital Liquidity		-0.017				-0.027				-0.005				-0.019		
		[0.383]				[0.195]				[0.788]				[0.310]		
Period of Merger			0.003				0.010				0.013				0.003	
			[0.768]				[0.399]				[0.217]				[0.737]	
Firms' Industry			-0.012				0.000				-0.010				-0.013	
			[0.158]				[0.982]				[0.280]				[0.134]	
CEO Stock Ownerships				-0.014				-0.016				-0.011				-0.012
				[0.699]				**[0.015]**				[0.103]				**[0.071]**
CEO Tenure				0.000				0.000				0.000				0.000
				[0.939]				[0.891]				[0.663]				[0.918]
CEOs' Behavior					-0.026	-0.030	-0.037	-0.025	-0.002	0.035	0.009	-0.001	0.006	-0.010	0.007	0.024
					[0.129]	**[0.067**	**[0.001]**	**[0.037]**	[0.905]	**[0.018]**	[0.338]	[0.943]	[0.669]	[0.502]	[0.396]	**[0.043]**
Adjusted R^2	0.019	-0.009	0.000	-0.010	0.038	0.018	0.045	0.044	0.012	0.021	0.002	-0.001	0.013	-0.011	0.000	0.017
SE of the Estimate	0.090	0.085	0.065	0.084	0.092	0.087	0.077	0.083	0.091	0.078	0.068	0.086	0.091	0.084	0.065	0.086
p-value for *F*-test	0.097	0.679	0.362	0.898	0.049	0.159	0.006	0.006	0.198	0.120	0.334	0.426	0.184	0.704	0.385	0.078
Number of obs.	144	142	225	187	128	126	211	210	144	136	229	225	144	141	226	226

(Panel C) Predicting post-merger market-to-book (M/B)

	Without Measure of CEOs' Behavior				*With Measure A (Model A)*				*With Measure B (Model B)*				*With Measure C (Model C)*			
	1	**2**	**3**	**4**	**A1**	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**
Intercept	0.840	0.864	0.923	1.094	1.059	0.781	0.853	1.166	0.947	0.838	0.829	1.326	0.613	0.800	0.676	0.889
	[0.002]	[0.000]	[0.000]	[0.000]	[0.003]	[0.000]	[0.000]	[0.000]	[0.008]	[0.000]	[0.000]	[0.000]	[0.071]	[0.000]	[0.000]	[0.000]
Pre-Merger FCF	0.007				0.007				0.007				0.007			
	[0.000]				**[0.000]**				**[0.000]**				**[0.000]**			
Pre-Merger Lev.	-1.682				-1.631				-1.657				-1.668			
	[0.004]				**[0.006]**				**[0.005]**				**[0.004]**			
Method of Payment		0.069				-0.001				0.067				0.052		
		[0.629]				[0.993]				[0.641]				[0.719]		
Capital Liquidity		-0.330				-0.311				-0.329				-0.319		
		[0.045]				**[0.055]**				**[0.046]**				**[0.053]**		
Period of Merger			-0.058				0.015				-0.066				-0.282	
			[0.691]				[0.924]				[0.640]				**[0.023]**	
Firms' Industry			-0.283				-0.197				-0.171				-0.284	
			[0.039]				[0.197]				[0.200]				**[0.013]**	
CEO Ownerships			-1.319				-1.340				-1.038				-1.173	
				[0.058]				**[0.070]**				[0.133]				[0.103]
CEO Tenure				0.000				0.000				0.000				0.000
				[0.013]				**[0.010]**				**[0.012]**				**[0.019]**
CEOs' Behavior					-0.655	0.228	0.075	0.000	-0.174	0.036	-0.020	-0.306	0.387	0.136	0.330	0.507
					[0.072]	[0.106]	[0.625]	[1.000]	[0.637]	[0.811]	[0.887]	[0.264]	[0.269]	[0.312]	**[0.003]**	**[0.038]**
Adjusted R^2	0.158	0.023	0.012	0.027	0.202	0.034	-0.006	0.025	0.153	0.015	-0.004	0.025	0.159	0.023	0.083	0.038
SE of the Estimate	2.170	0.702	0.970	1.615	2.109	0.634	1.023	1.742	2.176	0.705	0.934	1.709	2.168	0.702	0.777	1.700
p-value for *F*-test	0.000	0.104	0.094	0.025	0.000	0.104	0.609	0.056	0.000	0.207	0.554	0.046	0.000	0.137	0.000	0.014
Number of obs.	156	111	221	197	142	95	200	187	156	111	217	201	156	111	204	200

Appendix 2. Predicting Post-Merger Operating Performance Using Each of Measures of CEOs' Behavior and Group of Classified Predictors

The predictors employed in the regression analysis are classified as follows: accounting numbers factors that consist of free cash flows and leverage, financing factors that consist of method of payment and capital liquidity, merger factors that comprise the period of merger and the industry of merged firms, and CEOs factors that contain CEO tenure and CEO stock ownerships. Measure A, Measure B, and Measure C are used in Model A, Model B, and Model C, respectively, as measures of CEOs' behavior.

(Panel A) Predicting post-merger return on assets (ROA)

	Without Measure of Behavior				*With Measure A (Model A)*					*With Measure B (Model B)*					*With Measure C (Model C)*				
	1	**2**	**3**	**4**	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**C1**	**C2**	**C3**	**C4**	**C5**
Intercept	0.082	0.046	0.022	0.032	0.060	0.042	0.036	0.007	0.067	0.099	0.066	0.033	0.023	0.055	0.086	0.052	0.025	-0.010	0.036
	[0.007]	[0.161]	[0.554]	[0.411]	[0.058]	[0.257]	[0.387]	[0.859]	[0.137]	[0.005]	[0.069]	[0.438]	[0.555]	[0.194]	[0.005]	[0.136]	[0.524]	[0.787]	[0.377]
Pre-Merger FCF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	[0.086]	[0.120]	[0.105]	**[0.037]**	**[0.001]**	**[0.012]**	[0.103]	[0.173]	**[0.041]**	**[0.075]**	[0.106]	[0.103]	[0.182]	**[0.036]**	**[0.032]**	[0.131]	[0.114]	[0.165]	**[0.037]**
Pre-Merger Lev.	-0.091	-0.084	-0.067	0.009	-0.087	-0.057	-0.063	-0.012	-0.010	-0.084	-0.075	-0.062	0.010	0.023	-0.116	-0.083	-0.066	-0.013	0.002
	[0.064]	**[0.082]**	[0.185]	[0.852]	**[0.053]**	[0.227]	[0.208]	[0.809]	[0.834]	**[0.091]**	[0.120]	[0.222]	[0.834]	[0.622]	**[0.016]**	**[0.088]**	[0.194]	[0.782]	[0.969]
Meth. of Payment	0.030	0.011	0.016	-0.015	0.045	0.034	0.027	0.012	0.000	0.032	0.012	0.016	-0.003	-0.016	0.030	0.015	0.018	-0.005	-0.009
	[0.287]	[0.705]	[0.587]	[0.574]	**[0.091]**	[0.262]	[0.360]	[0.662]	[0.988]	[0.262]	[0.669]	[0.578]	[0.917]	[0.547]	[0.285]	[0.624]	[0.559]	[0.865]	[0.735]
Capital Liquidity	-0.022	-0.030	-0.020	0.026	-0.019	-0.026	-0.037	-0.023	0.004	-0.025	-0.036	-0.023	-0.012	0.019	-0.015	-0.029	-0.020	-0.005	0.013
	[0.536]	[0.392]	[0.579]	[0.426]	[0.549]	[0.449]	[0.291]	[0.487]	[0.911]	[0.473]	[0.309]	[0.529]	[0.713]	[0.573]	[0.647]	[0.404]	[0.582]	[0.868]	[0.706]
Period of Merger		0.029	0.042	0.062		0.032	0.062	0.037	0.058		0.027	0.040	0.023	0.050		0.027	0.040	0.035	0.062
		[0.345]	[0.174]	**[0.049]**		[0.330]	**[0.078]**	[0.275]	[0.114]		[0.381]	[0.199]	[0.440]	[0.124]		[0.389]	[0.195]	[0.247]	**[0.059]**
Firms' Industry		0.065	0.052	0.045		0.040	0.053	0.048	0.044		0.070	0.054	0.053	0.047		0.065	0.052	0.049	0.048
		[0.028]	**[0.089]**	[0.100]		[0.173]	**[0.075]**	**[0.086]**	[0.130]		**[0.019]**	**[0.081]**	**[0.052]**	**[0.085]**		**[0.029]**	**[0.092]**	**[0.075]**	**[0.087]**
CEO Ownerships			-0.003	-0.001			-0.006	-0.006	0.001			-0.003	-0.007	-0.001			-0.003	-0.006	0.001
			[0.407]	[0.842]			[0.651]	[0.615]	[0.947]			[0.470]	[0.239]	[0.815]			[0.406]	[0.412]	[0.958]
CEO Tenure			0.000	0.000			0.000	0.000	0.000			0.000	0.000	0.000			0.000	0.000	0.000
			[0.291]	[0.422]			[0.558]	[0.574]	[0.762]			[0.353]	[0.483]	[0.597]			[0.282]	[0.416]	[0.640]
Pre-Merger ROA				0.445				0.377	0.299				0.460	0.492				0.409	0.419
				[0.000]				**[0.003]**	**[0.003]**				**[0.000]**	**[0.000]**				**[0.001]**	**[0.001]**
Premiums Paid				-0.104					-0.109					-0.096					-0.106
				[0.022]					**[0.021]**					**[0.033]**					**[0.024]**
CEOs' Behavior					-0.038	-0.037	-0.019	-0.013	-0.019	-0.030	-0.037	-0.016	-0.042	-0.038	-0.025	-0.015	-0.007	0.016	0.002
					[0.131]	[0.195]	[0.527]	[0.647]	[0.516]	[0.299]	[0.190]	[0.590]	[0.118]	[0.160]	[0.343]	[0.592]	[0.793]	[0.554]	[0.933]
Adjusted R^2	0.035	0.079	0.061	0.282	0.157	0.133	0.146	0.215	0.296	0.036	0.087	0.053	0.224	0.293	0.071	0.071	0.050	0.191	0.273
SE of the Estimate	0.128	0.125	0.122	0.103	0.110	0.117	0.114	0.108	0.105	0.128	0.125	0.123	0.106	0.103	0.122	0.126	0.123	0.108	0.104
p-value for *F*-test	0.129	0.041	0.108	0.000	0.003	0.013	0.017	0.003	0.000	0.146	0.038	0.147	0.001	0.000	0.045	0.063	0.157	0.004	0.001
Number of obs.	92	92	88	76	80	81	77	76	71	92	92	88	83	76	91	92	88	82	73

(Panel B) Predicting post-merger net income to sales (NIS)

	Without Measure of Behavior				*With Measure A (Model A)*					*With Measure B (Model B)*					*With Measure C (Model C)*				
	1	**2**	**3**	**4**	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**C1**	**C2**	**C3**	**C4**	**C5**
Intercept	0.032	0.007	0.001	0.008	0.054	0.032	0.041	0.006	0.043	0.026	0.001	-0.013	-0.038	-0.006	0.040	0.012	0.008	-0.016	0.028
	[0.131]	[0.763]	[0.980]	[0.785]	[0.053]	[0.292]	[0.235]	[0.827]	[0.182]	[0.275]	[0.962]	[0.680]	[0.198]	[0.862]	[0.070]	[0.598]	[0.770]	[0.557]	[0.359]
Pre-Merger FCF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	[0.045]	[0.109]	[0.197]	[0.191]	**[0.060]**	[0.222]	[0.577]	[0.658]	[0.326]	**[0.052]**	[0.121]	[0.209]	[0.246]	[0.218]	**[0.043]**	[0.106]	[0.201]	[0.352]	[0.172]
Pre-Merger Lev.	-0.027	-0.017	-0.018	0.003	0.001	-0.001	0.022	0.019	0.009	-0.030	-0.020	-0.025	-0.014	-0.004	-0.025	-0.016	-0.021	0.005	0.000
	[0.438]	[0.608]	[0.616]	[0.934]	[0.978]	[0.982]	[0.584]	[0.566]	[0.788]	[0.393]	[0.548]	[0.499]	[0.682]	[0.913]	[0.470]	[0.617]	[0.550]	[0.876]	[0.996]
Meth. of Payment	0.031	0.015	0.013	0.009	0.048	0.028	0.026	0.019	0.008	0.030	0.014	0.013	0.019	0.009	0.037	0.019	0.019	0.030	0.015
	[0.131]	[0.469]	[0.532]	[0.666]	**[0.044]**	[0.267]	[0.301]	[0.368]	[0.691]	[0.136]	[0.475]	[0.532]	[0.328]	[0.644]	**[0.077]**	[0.368]	[0.396]	[0.150]	[0.437]
Capital Liquidity	-0.005	-0.001	-0.002	0.003	-0.021	-0.022	-0.033	-0.027	-0.020	-0.003	0.001	0.003	-0.002	0.007	-0.003	-0.001	-0.003	-0.012	0.003
	[0.858]	[0.958]	[0.929]	[0.921]	[0.465]	[0.461]	[0.268]	[0.293]	[0.442]	[0.918]	[0.969]	[0.913]	[0.935]	[0.780]	[0.899]	[0.954]	[0.902]	[0.639]	[0.895]
Period of Merger		0.051	0.051	0.060		0.027	0.023	0.022	0.029		0.052	0.054	0.046	0.064		0.046	0.044	0.026	0.045
		[0.025]	**[0.040]**	**[0.011]**		[0.401]	[0.461]	[0.392]	[0.283]		**[0.024]**	**[0.032]**	**[0.046]**	**[0.008]**		**[0.052]**	**[0.092]**	[0.276]	**[0.064]**
Firms' Industry		0.040	0.045	0.055		0.048	0.052	0.049	0.051		0.039	0.043	0.041	0.053		0.041	0.046	0.048	0.056
		[0.050]	**[0.049]**	**[0.012]**		**[0.058]**	**[0.043]**	**[0.018]**	**[0.016]**		**[0.060]**	**[0.062]**	**[0.052]**	**[0.014]**		**[0.050]**	**[0.040]**	**[0.024]**	**[0.009]**
CEO Ownerships			-0.003	0.004			-0.022	-0.015	-0.008			-0.003	0.003	0.003			-0.003	0.003	0.003
			[0.396]	[0.313]			**[0.045]**	[0.102]	[0.364]			[0.353]	[0.480]	[0.384]			[0.337]	[0.410]	[0.438]
CEO Tenure			0.000	0.000			0.000	0.000	0.000			0.000	0.000	0.000			0.000	0.000	0.000
			[0.495]	[0.318]			[0.390]	[0.318]	[0.339]			[0.412]	[0.407]	[0.249]			[0.432]	[0.427]	0.182]
Pre-Merger NI/Sls				0.467				0.549	0.554				0.375	0.459				0.467	0.478
				[0.000]				**[0.000]**	**[0.000]**				**[0.001]**	**[0.000]**				**[0.000]**	**[0.000]**
Premiums Paid				-0.100					-0.077					-0.100					-0.108
				[0.004]					**[0.022]**					**[0.004]**					**[0.002]**
CEOs' Behavior					-0.053	-0.041	-0.037	-0.028	-0.043	0.010	0.010	0.019	0.021	0.020	-0.026	-0.016	-0.018	-0.030	-0.042
					[0.022]	[0.117]	[0.166]	[0.202]	**[0.063]**	[0.624]	[0.606]	[0.388]	[0.313]	[0.348]	[0.187]	[0.423]	[0.397]	[0.137]	**[0.035]**
Adjusted R^2	0.033	0.116	0.100	0.396	0.088	0.121	0.145	0.445	0.516	0.024	0.107	0.097	0.239	0.395	0.043	0.112	0.102	0.318	0.428
SE of the Est.	0.088	0.084	0.087	0.078	0.096	0.095	0.094	0.076	0.072	0.089	0.085	0.087	0.080	0.078	0.088	0.085	0.087	0.081	0.076
p-value for *F*-test	0.155	0.016	0.047	0.000	0.045	0.027	0.023	0.000	0.000	0.231	0.027	0.059	0.001	0.000	0.136	0.023	0.051	0.000	0.000
Number of obs.	83	83	79	74	73	73	72	71	66	83	83	79	78	74	83	83	80	79	74

(Panel C) Predicting post-merger market-to-book (M/B)

	Without Measure of Behavior				*With Measure A (Model A)*					*With Measure B (Model B)*					*With Measure C (Model C)*				
	1	**2**	**3**	**4**	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**C1**	**C2**	**C3**	**C4**	**C5**
Intercept	0.631	0.289	-0.994	-0.469	0.754	0.517	-0.002	-0.152	0.178	1.473	0.611	-1.016	-0.968	-0.393	1.178	0.370	-1.063	-0.999	-0.513
	[0.306]	[0.669]	[0.177]	[0.510]	[0.214]	[0.442]	[0.998]	[0.837]	[0.831]	[0.033]	[0.411]	[0.227]	[0.257]	[0.624]	[0.069]	[0.607]	[0.165]	[0.206]	0.503]
Pre-Merger FCF	0.008	0.007	0.010	0.010	0.010	0.010	0.010	0.008	0.010	0.007	0.008	0.010	0.010	0.010	0.007	0.007	0.010	0.010	0.010
	[0.000]	**[0.001]**	**[0.000]**	**[0.000]**	**[0.000]**	**[0.000]**	**[0.000]**	**[0.000]**	**[0.000]**	**[0.000]**	**[0.000]**	**[0.000]**	**[0.000]**	**[0.000]**	**[0.001]**	**[0.001]**	**[0.000]**	**[0.000]**	**[0.000]**
Pre-Merger Lev.	-1.667	-1.612	-1.064	-0.498	-1.119	-1.005	-1.336	-1.109	-0.867	-1.690	-1.435	-1.075	-1.043	-0.466	-1.872	-1.606	-1.095	-1.049	-0.499
	[0.089]	[0.104]	[0.267]	[0.539]	[0.180]	[0.236]	[0.149]	[0.198]	[0.315]	**[0.075]**	[0.152]	[0.275]	[0.293]	[0.575]	**[0.048]**	[0.107]	[0.250]	[0.281]	[0.541]
Meth. of Payment	0.981	0.765	0.928	-0.356	1.017	0.845	0.787	-0.223	-0.331	0.733	0.800	0.926	0.882	-0.358	0.754	0.812	0.790	0.871	-0.365
	[0.096]	[0.219]	[0.118]	[0.484]	**[0.049]**	[0.137]	[0.175]	[0.680]	[0.540]	[0.196]	[0.199]	[0.121]	[0.149]	[0.485]	[0.193]	[0.205]	[0.190]	[0.159]	[0.479]
Capital Liquidity	-0.789	-0.975	-0.373	-0.093	-0.858	-0.747	-0.612	-0.507	-0.198	-1.032	-1.053	-0.368	-0.422	-0.119	-0.953	-0.975	-0.357	-0.415	-0.089
	[0.270]	[0.184]	[0.591]	[0.880]	[0.157]	[0.239]	[0.355]	[0.426]	[0.766]	[0.132]	[0.154]	[0.602]	[0.559]	[0.851]	[0.166]	[0.187]	[0.605]	[0.562]	[0.886]
Period of Mergers		-0.067	0.426	1.158		0.597	1.043	0.997	0.822		-0.108	0.430	0.331	1.135		-0.097	0.587	0.351	1.186
		[0.920]	[0.494]	**[0.063]**		[0.350]	[0.131]	[0.140]	[0.256]		[0.871]	[0.495]	[0.629]	**[0.075]**		[0.885]	[0.353]	[0.614]	**[0.068]**
Firms' Industry		0.878	0.316	-0.206		0.045	0.089	0.041	-0.206		0.957	0.313	0.306	-0.202		0.879	0.353	0.308	-0.203
		[0.155]	[0.601]	[0.699]		[0.934]	[0.875]	[0.938]	[0.707]		[0.124]	[0.609]	[0.618]	[0.706]		[0.156]	[0.556]	[0.615]	[0.704]
CEO Ownerships			0.049	0.216			0.214	0.311	0.388			0.049	0.036	0.218			-0.006	0.038	0.219
			[0.517]	**[0.007]**			[0.386]	[0.179]	**[0.098]**			[0.533]	[0.668]	**[0.007]**			[0.945]	[0.658]	**[0.008]**
CEO Tenure			0.000	0.000			0.000	0.000	0.000			0.000	0.000	0.000			0.000	0.000	0.000
			[0.095]	[0.661]			[0.584]	[0.772]	[0.757]			[0.101]	[0.102]	[0.699]			[0.101]	[0.103]	[0.688]
Pre-Merger M/B				0.749				0.655	0.717				0.037	0.752				0.034	0.746
				[0.000]				**[0.000]**	**[0.000]**				[0.702]	**[0.000]**				[0.732]	**[0.000]**
Premiums Paid				-0.327					-0.416					-0.313					-0.310
				[0.695]					[0.631]					[0.710]					[0.713]
CEOs' Behavior						-1.126	-0.931	-0.685	-0.528	-0.610	-0.732	-0.625	0.033	-0.003	-0.108	-0.325	-0.198	0.292	0.065
0.081																			
						[0.023]	**[0.083]**	[0.233]	[0.340]	[0.293]	[0.195]	[0.293]	[0.955]	[0.996]	[0.833]	[0.550]	[0.729]	[0.595]	[0.909]
[0.870]																			
Adjusted R^2	0.155	0.155	0.225	0.530	0.308	0.298	0.295	0.481	0.538	0.162	0.156	0.215	0.207	0.524	0.149	0.147	0.220	0.207	0.524
SE of the Estimate	2.672	2.671	2.458	2.007	2.180	2.195	2.222	2.066	2.001	2.538	2.670	2.473	2.486	2.021	2.557	2.685	2.438	2.486	2.021
p-value for *F*-test	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.003	0.001	0.001	0.000	0.002	0.004	0.001	0.001	0.000
Number of obs.	93	93	89	79	82	82	78	78	72	92	93	89	89	79	92	93	88	89	79