

Acquisitions Driven by Stock Overvaluation: Are They Good Deals?*

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Abstract

Stock overvaluation might drive a firm to use its stock to acquire another firm whose stock is not overpriced to the same extent. Though hypothetically desirable, these acquisitions end up bringing little benefit, if any, to acquirer shareholders. Two factors, acquirers paying a large premium to the target and investors' correction of acquirer stock overvaluation, move the stock prices of the acquirer and target in different directions during the acquisition process, resulting in little relative overvaluation between the two merging firms on the date of completion. Acquisitions driven by stock overvaluation often have negative economic synergies, which further doubts that the true motivation of these deals is for the benefit of acquirer shareholders. Acquirer CEOs obtain a large amount of new stock and option grants after acquisitions and realize a net gain in wealth. The findings support Jensen's (2005) proposition that stock overvaluation increases agency costs. Acquisitions driven by stock overvaluation benefit managers more than shareholders.

JEL classification: G34, G14

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On March 22, 2000, PSINet Inc., a giant Internet service provider, announced to acquire Metamor Worldwide Inc., a technology consulting firm, for \$1.9 billion in stock. Each share of Metamor would be exchanged for 0.9 shares of PSINet. The price of PSINet shares was \$49.50 and the price of Metamor was \$16.00 before the announcement.

"The deal is also the latest example of how a company such as PSINet can use its highflying stock as currency for stock-swap acquisitions. PSINet's stock has soared 51% in the past three months, while the stock of Metamor has fallen 45% in the same time period."

--Wall Street Journal, March 22, 2000

"Wall Street's initial reaction, however, was that the deal was better for Metamor's stockholders than for PSINet. Metamor's share price more than doubled, to \$ 33.31 1/4, up \$ 17.31 1/4 for the day. Meanwhile, shares of PSINet fell 16 percent, to \$ 41.56 1/4."

--Washington post, March 23, 2000

"We purchased Metamor, in retrospect, at exactly the wrong time," Mr. William Schrader (then the CEO of PSINet) said in an interview.

-- New York Times, November 3, 2000

PSINet Inc. filed for Chapter 11 bankruptcy in May 2001.

1. Introduction

In an influential study, Shleifer and Vishny (2003) suggest that stock market overvaluation motivates corporate acquisitions. If a firm's stock is overvalued, managers of this firm may use the overpriced stock as cheap currency to buy the other firm as long as the stock of the target is less overvalued. The acquisitions would benefit existing shareholders of the acquirers, even if they do not generate economic synergies.¹ Empirical evidence generally supports the claim that stock overvaluation motivates firms to pursue stock acquisitions. For example, studies such as Rhodes-Kropf, Robinson, and Viswanathan (2005), Dong, Hirshleifer, Richardson, and Teoh (2006), and Ang and Cheng (2006) show that acquirers

¹ Why would the target agree to a stock merger? Shleifer and Vishny (2003) argue that target shareholders might have short investment horizons so they can cash out by selling acquirer shares before the overvaluation gets corrected. It is also possible that acquirers pay target management to agree to the deal through the acceleration in stock option exercises, severance pay, or even keeping target managers in top positions. Rhodes-Kropf and Viswanathan (2004) further suggest that targets might over-estimate the potential acquisition synergies when the market-wide overvaluation is severe. So they mistakenly accept the stock swaps that are in favor of acquirer shareholders.

usually have a higher market-to-book equity ratio and are more overvalued than their targets before the merger. Stock overvaluation increases a firm's probability of becoming a bidder and of using stock as the method of payment in acquisitions.

However, whether acquirer shareholders finally benefit from the acquisitions driven by stock overvaluation is a different question. Investors would correct the overvaluation of the acquirer stock, at least to some extent, once the acquisition attempt is revealed. Moreover, target shareholders would demand a sizable premium to be taken over by the acquirer. These two factors often decrease the stock price of the acquirer and increase the stock price of the target during the acquisition process. The price movement in different directions would shrink or even eliminate the stock overvaluation of the acquirer relative to the target and therefore erode the potential benefits to the acquirer shareholders.

We examine the completed mergers and acquisitions in the U.S. market during 1985-2006 to test this hypothesis. Using two different measures of stock overvaluation, we confirm that bidders tend to be more overvalued than the targets, especially when the acquisition is financed by stock. However, the relative overvaluation almost disappears by the date that the merger is completed. Assuming Shleifer and Vishny (2003) are correct that some stock acquisitions are motivated by the relative overvaluation between the acquirer and target, we sort the relative overvaluation before the announcement and focus our attention on the one-third of the stock acquisitions with the largest relative overvaluation, which we call acquisitions driven by stock overvaluation or OV acquisitions. The other one-third stock acquisitions with the lowest and often negative relative overvaluation are assumed not to be motivated by stock overvaluation, labeled as NOV acquisitions. The middle one-third stock acquisitions are excluded from analyses to mitigate potential measurement errors associated

with our measures of stock overvaluation. We find that OV acquirers tend to pay a significantly higher premium to their targets and incur a larger drop in stock price during the acquisition process than NOV and cash acquirers. On the other hand, the targets of OV acquisitions realize a significantly larger increase in stock price than the targets of other acquisitions. The findings cast doubt on the effectiveness of the firms' use of stock acquisitions to take advantage of the market's temporary overvaluation of their stock.

Why would a firm make an acquisition for stock, rather than just issue equity and invest in either cash or its own business? The cost of equity issues is generally much lower than the cost of acquisitions due to the high acquisition premium. Shleifer and Vishny (2003) emphasize the importance of having high synergies to justify the firm's choice for acquisitions. However, we find that stock acquisitions driven by overvaluation tend to have lower and often negative synergies relative to NOV and cash acquisitions, where synergies are derived based on the market value and stock returns of the merging firms during the acquisition period. Examination on the operating performance yields a consistent result. The merged firms of OV acquisitions experience a significant deterioration in operating ROA (i.e., operating income divided by the market value of assets) after acquisitions, controlling for industry, size, and the pre-merger performance. Moreover, OV acquisitions have a higher percentage of business-diversifying deals than NOV acquisitions. The evidence further challenges the true motivation of acquisitions driven by stock overvaluation is for the benefit of acquirer shareholders.

What could be the true motivation then? We find that acquirer CEOs of OV acquisitions obtain a large amount of new stock and option grants as well as an increase in cash salary and bonus after the mergers. The large increase in compensation dominates the relatively

small decrease in the value of the CEO's equity holding of the company. The findings are consistent with Jensen's (2005) proposition that stock overvaluation brings about agency costs to shareholders. Overvaluation, by definition, means that the firm is unable to deliver the operating performance to justify the current high stock price. Managers under the pressure to meet the unachievable expectations would take risky actions that end up destroying the firm's core value. Bad acquisitions are one type of the value destruction actions. Jensen points out that the prevalence of equity-based managerial compensation in the past two decades, such as incentive bonus based on stock price appreciation and stock option grants, throws gasoline on a fire.

Mergers and acquisitions are often regarded as one of the primary ways that managers build their corporate empire at the expense of shareholders.² Recently, Moeller, Schlingemann, and Stulz (2005) show that acquirer shareholders, in aggregate, lose \$240 billion during the three-day announcement period in the mergers and acquisitions of 1998-2001. This large loss is due to both negative synergies and wealth transfer from acquirer to target shareholders. Masulis, Wang, and Xie (2007) show that poor corporate governance encourages managers to indulge in empire-building acquisitions and these acquisitions incur more negative announcement returns. Harford and Li (2007) show that acquirer CEO's compensation schemes increase CEO's incentives to pursue a merger. Acquirer CEOs are better off due to new stock and option grants following the mergers. Moreover, the incentive alignment becomes worse after the merger. CEO's salary and wealth become insensitive to poor performance but remain sensitive to good performance after acquisitions. Gu and Lev (2008) find that acquisitions driven by stock overvaluation often trigger massive goodwill write-offs in the subsequent years. The stock price of the acquirers performs badly after the

² See earlier studies such as Jensen (1986), Morck, Shleifer, and Vishny (1990), among others.

merger beyond the correction of overvaluation. They conclude that “business acquisitions by overpriced companies—a strategy often recommended by investment bankers and some academics—is by and large a losing proposition for buyers’ shareholders.” Our results in this paper are consistent with these studies.

Shleifer and Vishny (2003) imply that asset prices affect firms’ acquisition decisions. Asset prices also reflect acquisition decisions, as suggested by Edmans, Goldstein, and Jiang (2008). They find that a firm’s discount to its maximum potential value attracts takeovers but market expectations of an acquisition cause the discount to shrink, thus deterring the bid from actually occurring. We show that this feedback loop also affects the acquirers. Stock overvaluation might motivate a firm to become a bidder for the benefit of its shareholders, but the revelation of its acquisition attempt moves the stock prices of the merging firms, acquirer shareholders ending up little benefit from the acquisition.

The remainder of the paper proceeds as follows. Section 2 describes the data of mergers and acquisitions. Section 3 introduces our empirical measures of stock overvaluation and Section 4 investigates the relative overvaluation of the acquirer to the target and how it varies during the acquisition process. Section 5 examines acquisition synergies and Section 6 investigates changes in compensation and wealth of acquirer CEOs following acquisitions. Section 7 concludes.

2. Data

The data of mergers and acquisitions are obtained from the Securities Data Company’s (SDC) U.S. database. We use the following criteria to select the final sample.

- 1) The acquisition is announced and completed during 1985 to 2006.
- 2) Both the acquirer and target are public firms listed on the NYSE, AMEX, or Nasdaq.
- 3) The deal value is at least \$10 million and at least 1% of the acquirer's market value of equity.
- 4) The acquirer controls less than 50% of the target's shares prior to the announcement and owns 100% of the target's shares after the transaction.
- 5) Both the acquirer and the target has a positive book value of equity and data items in the Compustat and CRSP merged database to compute its market-to-book ratio of assets at the fiscal year end before acquisition announcement.

The final sample has 1,367 stock-financed mergers, 692 cash-financed mergers, and 990 mixed-financed mergers. Table 1 reports the number of acquisitions by the calendar year of acquisition announcement and the relative deal size – the ratio of deal value to the acquirer's market value of equity at the fiscal year end before the announcement. Consistent with early studies, there are more mergers and acquisitions in the late 1980s and during 1994-2000. Cash-financed acquisitions appear relatively more popular in the 1980s, but since 1989 the majority of the acquisitions are financed, at least partially, by stock. On average, the deal value is 24% of the acquirer's existing market value of equity.

Our research object is stock-financed acquisitions motivated by acquirer stock overvaluation. We include cash acquisitions in the following examinations as a benchmark for comparison. Shleifer and Vishny (2003) suggest that the choice of payment method indicates the acquirer's view of the relative overvaluation between its own firm and the target. Stock is preferred if the relative overvaluation is large. Cash would be adopted only

when the target is undervalued and the acquirer does not have much relative overvaluation advantage over the target. In other words, the choice of cash as the payment method signals that the acquisition is not motivated by acquirer stock overvaluation.

Table 2 summarizes the firm characteristics and the operating and stock price performance of the merging firms in the fiscal year prior to the acquisition announcement. Overall speaking, bidders are larger in size, have better operating performance and higher leverage than targets. But there are no dramatic differences in bidders of the stock and cash acquisitions. The variables also have similar values for the target of these two groups. Relative to the market, stock bidders experience a significant price increase in the year prior to the announcement, while targets of the stock bidders as well as the bidders and targets in cash acquisitions realize similar returns as the market does.

3. Measures of stock overvaluation

We examine whether acquisitions driven by stock overvaluation benefit acquirer shareholders. Our first task is to identify acquirers whose stock is more overvalued than their targets before the merger. We use two different methods to measure stock overvaluation.

The first method follows a methodology developed by Rhodes-Kropf, Robinson, and Viswanathan (2005, hereafter RKR), under which the market-to-book equity ratio is decomposed into components of investor misvaluation and growth options. By controlling for the systematic differences in growth options among firms and industries, this method

yields a relatively pure measure of misvaluation. This decomposition has also been used in recent studies such as Hertz and Li (2007) and Ma, Whidbee, and Zhang (2008).

A firm's log market-to-book equity ratio (M/B) can be decomposed into two items,

$$\ln(M / B) = \ln(M / V) + \ln(V / B), \quad (1)$$

where M is the observed market value of equity and B is the book value of equity. V stands for the intrinsic value of equity, which is unobservable. Previous studies, for example Lee, Myers, and Swaminathan (1999), Ang and Cheng (2006), and Dong, Hershleifer, Richardson, and Teoh (2006), use a residual income model from the accounting literature to estimate V . However the residual income model is known to rely on a number of fairly restrictive assumptions. Moreover, its reliance on analyst forecasts would bias the sample toward large transactions.

RKRV (2005) relax the residual income model and assume that a firm's intrinsic value is a linear function of its book value of equity, net income (i.e., the growth of book value of equity), and leverage. The parameters of the linear function are allowed to vary over time and across industries to reflect the variation in investment opportunities across times and industries. The parameters can also capture the difference in discount rates amongst firms. Specifically,

$$\ln(M_{it}) = \alpha_{0jt} + \alpha_{1jt} \ln(B_{it}) + \alpha_{2jt} \ln(|NI_{it}|) + \alpha_{3jt} I_{(<0)} \ln(|NI_{it}|) + \alpha_{4jt} LEV_{it} + \varepsilon_{it}. \quad (2)$$

$|NI_{it}|$ stands for the absolute value of net income of firm i at time t . $I_{(<0)}$ is an indicator variable which equals one for negative net income and zero otherwise. LEV is the market

leverage ratio. ε_{it} picks up the deviation of the intrinsic value from the observed market value and therefore is a natural proxy for misvaluation.

We run the cross-sectional regressions of Eq. (2) in each industry and each year to estimate the parameters α_{jt} . The subscript j stands for industry. We use the industry classification scheme developed by Fama and French (1997) to classify firms into 12 industries. We find similar results to RKR (2005). These three variables, i.e., book value of equity, net income, and leverage ratio, are able to explain the within-industry cross-sectional variations of market value of equity well. The regression R -squared are over 80% for almost all industries.

We calculate the fitted value by inserting the estimated parameters. The difference between the observed market value and the fitted value can be interpreted as the firm-level mispricing at a point of time. Previous studies suggest, however, that there is an important component of industry-specific misvaluation, and the magnitude of industry-level misvaluation also varies over time. So the effective mispricing for a firm should be the sum of firm-level and industry-level mispricing. Following RKR (2005), we take the time-series average of $\hat{\alpha}_{jt}$, the estimated α_{jt} from Eq. (2) to compute the long-run parameters,

$\bar{\alpha}_j = \frac{1}{T} \sum_t \hat{\alpha}_{jt}$. The final measure of RKR mispricing is:

$$\ln(M_{it}/V_{it}) = \ln(M_{it}) - [\bar{\alpha}_{0j} + \bar{\alpha}_{1j} \ln(B_{it}) + \bar{\alpha}_{2j} \ln(|NI_{it}|) + \bar{\alpha}_{3j} I_{(<0)} \ln(|NI_{it}|) + \bar{\alpha}_{4j} LEV_{it}]. \quad (3)$$

Our second measure of overvaluation is the industry-adjusted market-to-book ratio of equity,

$$Ind - adj OV = \frac{\left(\frac{M}{B}\right)_{it} - \left(\frac{M}{B}\right)_{jt}}{\left(\frac{M}{B}\right)_{it}}. \quad (4)$$

$\left(\frac{M}{B}\right)_{it}$ is the market-to-book equity ratio of stock i at time t . $\left(\frac{M}{B}\right)_{jt}$ is the median market-to-book equity ratio of industry j which stock i belongs at time t . The adjustment of industry median is intended to control for any differences in investment opportunities or risk across industries. We use the Fama and French (1997) 48-industry scheme to classify industries. A positive number suggests overvaluation relative to the industry median while a negative number suggests undervaluation. This measure has been used by previous studies such as Ang and Cheng (2006).

Table 3 reports the results of RKR decomposition of the market-to-book equity ratio and the industry-adjusted market-to-book equity ratio for merging firms. The correlations between these two measures of overvaluation are in fact over 0.60, thus results from these two methods are very similar. Consistent with the predictions of Shleifer and Vishny (2003) and the empirical evidence in RKR (2005), Ang and Cheng (2006), Dong et al. (2006), we find that bidders have significantly higher market-to-book ratios and are overpriced by more than targets. Among bidders, stock-financed bidders are overvalued by more than cash-financed bidders. Targets acquired by stock bidders are generally overvalued prior to the merger, but targets acquired by cash bidders are not much overpriced. Overall speaking, the

large relative overvaluation of the acquirer to the target seems to explain the motivation of stock-financed acquisitions well.³

4. Relative overvaluation of the acquirer to the target

As long as the acquirer's stock is more overvalued than the target's stock, a stock-swap acquisition would benefit acquirer shareholders. This statement is probably true when we evaluate an acquisition deal upon its completion. But as an *ex ante* motivation for acquisitions, this statement overlooks two typical facts of stock acquisitions. First, the acquirer often needs to pay a significant premium to take over the target. Second, the revelation of acquisition attempt signals information to the market and over time investors may correct the overvaluation of the acquirer stock to a large extent. As a result, the stock price of the target increases and the stock price of the acquirer decreases. This price movement of the merging firms shrinks or even eliminates the relative overvaluation that initially motivates the acquisition. Whether acquirer shareholders are able to benefit from the acquisition depends on if the relative overvaluation persists into the date that the merger is completed.

Table 4 shows the relative overvaluation of the stock-financed merging firms at the end of the month before the merger announcement and on the date of completion. The results of Panel A are based on the RKR_V measure and the results of Panel B are based on the industry-adjusted measure of overvaluation. Both acquirers and targets in the stock mergers

³ However, the stock of cash bidders is also more overvalued than the stock of their targets. If relative overvaluation determines bidder's choice for the medium of payment, as suggested by Shleifer and Vishny (2003), this raises a question that why don't these bidders use stock instead of cash as the medium of payment.

are overvalued on average before the announcement but the acquirers tend to be more overvalued than their targets. The relative overvaluation of the acquirer to the target is 0.39 under the RKR measure and 0.19 under the industry-median-adjusted measure. The evidence so far is consistent with Shleifer and Vishny's (2003) proposition that relative stock overvaluation might motivate acquisitions. However, the relative overvaluation slumps to 0.06 (or 85%) under the RKR measure or to 0.02 (or 90%) under the industry-median-adjusted measure. Though the differences are statistically significant at the 5% level, the economic magnitude is probably too trivial to justify an acquisition.

Next we directly examine changes in stock price for the acquirer and target respectively during the acquisition process. We first sort on the relative overvaluation before the announcement and divide stock-financed acquisitions into thirds. The first third with the highest values of relative overvaluation are more likely to be motivated by the stock overvaluation of the acquirer relative to the target. We label this group OV acquisitions—acquisitions driven by stock overvaluation. The last third of acquisitions with the lowest values of relative overvaluation are assumed not to be driven by stock overvaluation. We label it NOV acquisitions. Each of these two groups has 446 acquisitions. We exclude the middle third to mitigate any potential effects of measurement errors associated with our measures of overvaluation. Our interest of research is if OV acquisitions generate value for the shareholders of acquirers. We use NOV and cash acquisitions as a benchmark of comparison in the following analyses.

We follow the standard event study methodology to compute a three-day cumulative abnormal return (CAR) for each acquirer, a CAR from day -1 to day +1 relative to the announcement day. The market model is employed to estimate CARs. In particular, we use

the CRSP value-weighted index as the market portfolio, estimate the two parameters of the market model using returns from the trading day -253 to day -45, and use the estimated parameters to compute the expected return during the event window.⁴ The daily pricing errors—the differences between the realized return and the estimated expected return are cumulated over the three days of the event window to compute CARs.

Table 5 reports CARs respectively for stock bidders in the OV group, stock bidders in the NOV group, and cash bidders. Stock bidders realize significantly negative CARs in the three-day announcement window. Both the mean and median CARs for cash bidders are positive, though only the mean is statistically significant. If we compare the CARs of OV bidders to that of NOV or cash bidders, OV bidders experience a larger drop in stock price. The differences are statistically significant at the 1% level. Traditional short-window event studies are often used to infer whether mergers create value for shareholders, see, e.g., Jensen and Ruback (1983), Andrade, Mitchell, and Stafford (2001), Masulis, Wang, and Xie (2006), among others. The evidence that OV bidders realize significantly lower CARs than NOV bidders and cash bidders indicates that at least some shareholders of OV acquirers are not optimistic on the ability of the deal to create value.

The bidder's stock price movement upon acquisition announcement reflects the market's assessment of the merger's wealth effect for bidder shareholders. The market's assessment at announcement is, however, affected by the expected probability of merger completion. For example, if investors do not expect the announced acquisition attempt to succeed, this new information would largely be ignored and not incorporated in the stock price. In other words,

⁴ Schwert (1996) finds that target stock prices tend to move up since the trading day -42 and suggests that information about the acquisition might leak out during this period. By excluding data of the two months prior to the announcement in the estimation of parameters, our approach can mitigate any bias due to information leakage or other factors causing abnormal price run-up.

the announcement return tends to underestimate the value effect of the mergers that are finally completed. So following Andrade et al. (2001), we compute a full-period CAR from 20 days prior to the announcement date through to the completion date, [-20, close]. The inclusion of 20 days before the announcement is to account for the possible price movement due to investors' anticipation of the merger.

Table 5 shows that the results of CARs during the full period are very similar to the results of the three-day announcement. Stock bidders realize significantly negative returns while cash bidders do not. Among stock bidders, those in the OV group incur more negative returns than those in the NOV group. The differences in means or medians are statistically significant (p -values are all below 0.001). The evidence that OV bidders realize significantly lower CARs than NOV and cash bidders suggests that the originally expected advantage of relative overvaluation shrinks by the date that the merger is completed.

What drives the significantly larger drop in the stock price of OV bidders than other bidders? There are three possible and not mutually exclusive answers: (1) OV bidders pay higher premium to their target than other bidders, transferring wealth from acquirer to target shareholders; (2) OV bidders tend to be more overvalued ex ante and investors correct stock overvaluation during the acquisition process; (3) All else being equal, OV acquisitions generate the lowest or even negative synergies.

We investigate the first possible answer. Schwert (1996) suggests that acquisition premium can be estimated as the sum of the pre-bid run-up and the post-announcement increase in the target's stock price. Following his innovative way, we estimate acquisition

premium as the CAR of the target from the trading day -42 to the date of deal completion.⁵ Interestingly, it also captures the price movement of the target during the acquisition process. The results are reported in Table 5. Though bidders generally need to pay a premium to take over the target, OV bidders pay their target a premium that is almost double of the premium paid by NOV bidders. For example, bidders in the OV group pay an average acquisition premium of 35.33% for their target while NOV bidders pay an average premium of 19.87%, if the RKR measure is used to classify OV groups. The difference is even more striking if the industry-adjusted measure of overvaluation is used to define OV groups. It is known that, due to tax and agency cost reasons, cash bidders pay a significantly higher premium than stock bidders (e.g., Jensen and Ruback, 1983), however, we find that the premiums paid by OV stock bidders are in fact as high as the premiums paid by cash bidders.

5. Do acquisitions driven by stock overvaluation generate synergies?

Why do OV acquirers pay such a high premium to take over their target? It is possible that OV acquisitions would generate larger synergies than NOV and cash-financed acquisitions. Moreover, firms might have ways to preserve the benefit of temporary stock overvaluation other than stock-financed acquisitions, for instance, selling new shares at the overvalued price. The cost of equity issues is generally much lower than the cost of acquisitions due to the high acquisition premium. So why a firm would choose to make an acquisition for stock, rather than just issue equity and invest in either cash or its own business? To answer the question, Shleifer and Vishny (2003) also emphasize the importance of having high synergies to justify the firm's choice for acquisitions. In this section we

⁵ Bargeron, Schlingemann, Stulz, and Zutter (2007) adopt a similar method to estimate acquisition premium.

investigate if acquisitions driven by stock overvaluation generate larger synergies than other acquisitions.

5.1. Acquisition synergies derived from stock returns

We estimate merger synergies by using a method similar to Moeller, Schlingemann, and Stulz (2005). In particular, we estimate the full-period CAR over the event window of $[-20, \text{close}]$ for both the bidder and the target and then compute the product of the full-period CAR and the market value of equity 21 trading days before the announcement—the dollar changes. Acquisition synergies are then calculated as the sum of the dollar changes for both the bidder and the target divided by the market value of equity of the merged firm upon completion,

$$\text{Synergies} = \frac{\left(\text{CAR}_{[-20, \text{close}]}^{\text{bidder}} \times \text{ME}_{-21}^{\text{bidder}} \right) + \left(\text{CAR}_{[-20, \text{close}]}^{\text{target}} \times \text{ME}_{-21}^{\text{target}} \right)}{\text{ME}_{\text{close}}^{\text{merged}}}. \quad (5)$$

Table 6 reports the mean and median synergies of OV, NOV, and cash acquisitions. Acquisitions made by OV stock bidders generate the lowest and often negative synergies among these three groups. On average almost 20% of the merged firm’s market value of equity is vaporized during the process of OV acquisitions, compared to a loss of 10.8% for NOV acquisitions and a gain of 2.8% for cash acquisitions. The differences are statistically significant. The pattern for the medians is similar, though the magnitudes are relatively small. Clearly synergies can not explain the substantially higher premium paid to the target by OV stock bidders and probably, are also difficult to explain OV bidders’ choice of an acquisition over a new equity offering.

Business diversifying acquisitions are generally considered more likely to be value-destroying (see, e.g., Malmendier and Tate, 2008). As a quick test, we examine which group of acquisitions has more diversifying deals. A merger is classified as a diversifying deal if the bidder and target have different two-digit SIC codes. We find that 35% of the deals in the OV group are diversifying deals while only 28% of the NOV acquisitions are diversifying deals. Chi-square test suggests the difference is statistically significant. We however find that 43.5% of the cash acquisitions are diversifying deals, though cash deals on average generate positive synergies. One possible explanation is that the choice of cash as the method of payment is endogenous. Due to portfolio selection reasons, target shareholders would probably prefer cash to stock if the acquirer is in a different industry. As a result, we observe more diversifying deals in cash acquisitions.

5.2. Operating performance following mergers

Using evidence from stock returns to infer if mergers generate synergies is overshadowed by the fact that stock price may not always reflect intrinsic value. In other words, it is hard to judge if the negative synergies that we calculated based on stock returns are due to operating inefficiency of the merged firms or investors' correction of overvaluation. To answer this question, we directly examine if operating performance improves after mergers. Examination of operating performance would shed light on the source of economic gains or loss for the merger and allow us to evaluate whether the merger creates real value for the existing shareholders.

Our primary measure of operating performance is earnings before interest, taxes, depreciation and amortization (EBITDA, also called operating income before depreciation)

divided by the market value of the assets at the beginning of the fiscal year.⁶ Market value of assets is the sum of the market value of equity and the book values of preferred stock and debt net of cash. We call this measure operating ROA. Another measure of operating performance is asset turnover, calculated as sales divided by the market value of assets at the beginning of the fiscal year. It measures the productivity of the firm's assets. Panel A of Table 7 reports the median operating performance of merged firms from three years before the acquisitions to five years after the acquisitions, respectively for OV, NOV, and cash mergers. The operating performance before the merger is a weighted-average performance of the acquirer and target, with the weights being their relative market value of assets at the beginning of the fiscal year.

We employ two different methods to examine abnormal changes in operating performance after mergers. The first method follows Healy, Palepu, and Ruback (1992). We first identify the industry median operating performance of the bidder and target respectively in each year, and then calculate their weighted-average. The weights are the relative market value of assets of the two merging firms at the beginning of each year for the performance of the pre-merger years (years -3 to -1) and at the beginning of year 0 for the performance of year 0 and the post-merger years (years 1 to 5). Year 0 is the fiscal year that the merger is completed. We use Fama and French's (1997) scheme to classify 48 industries. This weighted-average performance is regarded as the benchmark performance for the merged firm. Abnormal operating performance, the difference between the operating performance of the merged firm and the benchmark performance, is calculated each year for

⁶ Healy, Palepu, and Ruback (1992) argue that the rationale for using the market value of the assets rather than the book value to deflate operating income is that market value represents the opportunity cost of the assets and therefore facilitates intertemporal and cross-sectional comparisons. Furthermore, using the market value of assets mitigates any effects arising from the choice of the accounting method for mergers.

each acquisition. We then run a cross-sectional regression to compute abnormal changes in performance due to the mergers,

$$PERFORMANCE_{post\ i} = \alpha + \beta PERFORMANCE_{pre\ i} + \varepsilon_i, \quad (6)$$

where the explanatory variable, $PERFORMANCE_{pre\ i}$, is the median abnormal operating performance for the merging firms of acquisition i during the pre-merger years (years -3 to -1) and the dependent variable, $PERFORMANCE_{post\ i}$, is the median abnormal operating performance during the post-merger years (years 1 to 5). The slope coefficient β captures the possible correlation in abnormal performance between the pre-and post-merger years. The intercept α measures the average change in the industry-adjusted abnormal performance that is due to the mergers.

Barber and Lyon (1996) emphasize the importance of matching firm size and the pre-event operating performance in estimating firms' abnormal performance after events. Our second method follows their suggestion. For every bidder and target firms, we find a control firm that (1) has total assets of 50%-150% of the merging firm and then (2) has the closest operating ROA to the merging firm in the fiscal year before the merger. As a result, we have a pair of control firms for each pair of bidder and target. Control firms are required to exist for at least three years and not to conduct seasoned equity offerings and involve in acquisitions in the following five years. The weighted-average operating performance of the control firm pair is calculated each year as the benchmark performance for the merged firm. The weights are the relative market value of assets of the two merging firms at the beginning of fiscal year 0. Abnormal operating performance is the difference in operating performance between the merged firm and its benchmark. We compute the median abnormal operating

performance over the five post-merger years to make statistical inference. Ghosh (2001) uses a similar method to examine post-merger operating performance. Using control firms matched on pre-merger performance and size, he finds no evidence that operating performance improves following acquisitions. He also shows that operating performance increases following cash acquisitions but decline for stock acquisitions.

Panel B of Table 7 presents the abnormal changes in operating performance after mergers. Consistent with Ghosh (2001), Healy, Pelepu, and Ruback's (1992) method seems to yield more optimistic post-merger operating performance than the method of Barber and Lyon (1996) does. The abnormal operating ROA generated under the first method are consistently higher for all three groups of acquisitions. In terms of statistical significance, these two methods disagree on whether operating ROA improves after cash mergers and declines following NOV acquisitions. But both methods suggest significant deterioration in operating ROA following the acquisitions driven by stock overvaluation. The deterioration is mainly due to a significant drop in asset turnover – the productivity of the merged firm's assets.

The poor operating performance following OV acquisitions casts doubt on if the merger generates large synergies. If not, why would OV acquirers pay a significantly higher premium to take over the target than other stock bidders? What is the true motivation behind the transaction? Studies suggest that managerial incentives affect the magnitude of acquisition premiums. For example, Bargeron, Schlingemann, Stulz, and Zutter (2007) show that public acquirers pay significantly more than private acquirers in acquisitions. The difference in acquisition premium cannot be explained by deal or target characteristics but is affected by the incentive of the acquiring firm managers. If the public acquirer has high managerial ownership, it pays a relatively lower acquisition premium.

6. Changes in compensation and wealth of acquirer CEOs after acquisitions

Jensen (2005) proposes that stock overvaluation increases agency costs. He explicitly points out that acquisitions driven by stock overvaluation, among others, reflect the agency costs. In other words, the managers of acquiring firms take up the acquisition to benefit themselves instead of shareholders. Studies of CEO compensation suggest this is highly probable. For instance, Grinstein and Hribar (2004) show that CEOs having more power to influence board decisions receive significantly larger M&A bonuses. The bonus compensation however does not appear to increase with deal performance. Based on 1,508 acquisitions during 1993-2000, Harford and Li (2007) find that acquirer CEOs are better off by new stock and option grants following acquisitions. The addition of large new grants offset the wealth reduction of the existing portfolio even for poorly performing firms. Moreover, CEO's pay and wealth become insensitive to poor performance but remain sensitive to good performance after acquisitions.

We investigate if the motivation of OV acquisitions can be explained by changes in wealth of acquirer CEOs. We follow the empirical approach in Harford and Li (2007) and decompose CEO compensation into two components: cash payment including annual salary and bonus compensation, and new grants of restricted stocks and stock options. Portfolio value of equity measures the market value of CEO's holdings of stock and options at the end of the fiscal year. We compare these three variables in the fiscal year before the merger announcement (denoted by $ayr-1$) with the values in the fiscal year following the merger completion (denoted by $cyr+1$). Table 8 presents the results. CEO compensation data are obtained from Compustat's ExecuComp database. Like Harford and Li (2007), we require

that the CEO be the same between *ayr-1* and *cyr+1* for a given firm. Our sample consists of 164 OV bidders, 122 NOV bidders, and 198 cash bidders with available compensation data. All dollar values are adjusted by CPI index to 2006 dollar for comparison over time, and are reported in thousands. Due to the severe positive skewness in the compensation data, we report and interpret based on the median values. Results based on mean values do not alter our qualitative conclusions.

Overall speaking, acquirer CEOs enjoy an increase in their wealth after acquisitions. Of the three groups, CEOs of OV acquisitions are able to enjoy the largest increase regardless the poorest performance of their acquisitions. Compared to year *ayr-1*, the median CEO obtains an increase in cash pay of \$0.28 million, an increase in grants of \$0.96 million, and an increase in portfolio value of equity of \$2.70 million. However if the value of grants that the CEO obtains from *ayr* to *cyr+1* is deducted from the equity portfolio, the CEO realizes a loss of \$4.42 million.⁷ The median value of cumulative grants from *ayr* to *cyr+1* is over \$10 million for the CEOs of OV acquisitions, compared to \$7.63 million for the CEOs of NOV acquisitions and \$5.84 million for the CEOs of cash acquisitions, which translate to 2.36%, 0.68%, and 1.89% of their deal value respectively.

In summary, acquirer CEOs of OV acquisitions managed to increase their total wealth by a large amount of new grants of stock and options. Although the deal performs poorly and the stock price drops as well as the value of their existing holding of the company, the value addition due to the new grants offsets the value loss of their existing portfolio. Our results are consistent with Grinstein and Hribar (2004) and Harford and Li (2007) that acquirer

⁷ In a separate analysis, we control for CEO transactions during this period, including buying or selling stocks and exercising stock options. Due to the availability of insider trading data, the control severely reduces the number of observations but change little of our results. The stock and option transaction data are from the Thomson Financial's database of insider trading. Tabulated results are available upon request of interested readers.

CEOs managed to increase their wealth after acquisitions and support Jensen (2005) that the agency costs might be the motivation for OV acquisitions.

7. Conclusion

Stock overvaluation drives managers of the overvalued firm to pursue acquisitions. If the acquisition is financed by the firm's overpriced stocks, acquiring firms' existing shareholders might benefit from this transaction for being able to use their inflated stocks to buy other firms' valuable assets. In this study we show that this hypothesis fails to account for the stock price movement during the acquisition process. The increase in target stock price and the decrease in acquirer stock price often shrink or even eliminate the relative overvaluation of the acquirer to the target and make the deal not attractive to acquirer shareholders on the date of completion. The relative price movement is driven by the substantial premium paid by the acquirer to the target, investors' correction of acquirer stock overvaluation, and the lack of synergies of the deal itself. The findings cast doubt on the motivation of these acquisitions being the benefit of acquirer shareholders.

We find that acquirer CEOs managed to increase their wealth after acquisitions. Although the drop in stock price and the poor performance of the deal decrease the value of CEO's holding of existing stock and options, the large amount of new stock and option grants more than offsets the loss. CEOs are clearly a beneficiary of the acquisitions, while acquirer shareholders are not. The evidence supports Jensen's (2005) agency costs proposition. Stock overvaluation brings about agency costs to the firm. Stock overvaluation makes managers harder or even impossible to achieve the expected performance implied by the high level of stock price. This generates incentives for managers to pursue excessive risky

investment, for example, an acquisition that has a small chance to win a jackpot but a big chance to destroy value. Since the NPV of this investment is negative ex ante, they are often bad deals for shareholders.

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Table 1
Distribution of mergers and acquisitions: 1985-2006

The sample consists of 1,367 stock-financed, 692 cash-financed, and 990 mixed-financed mergers and acquisitions that are announced and completed during 1985-2006 in the U.S. market. The table presents the sample distribution by the calendar year of acquisition announcement. The following criteria are used to select the sample from the SDC Domestic M&A database: (1) Both the acquirer and target are public firms listed on the NYSE, the AMEX, or the Nasdaq; (2) The deal value is at least \$10 million and at least 1% of the acquirer's market value of equity; (3) The acquirer controls less than 50% of the target's shares prior to the announcement and owns 100% of the target's shares after the transaction; (4) Both the acquirer and the target have positive book value of equity and data items in the Compustat and CRSP merged database to compute the market-to-book ratio of assets at the fiscal year end before the announcement. The relative size of the deal is calculated as the ratio of the deal value to the acquirer's existing market value of equity. The median across all the completed deals in each year is reported.

Year	N	Stock	Cash	Mixed	Relative Size
1985	80	26	34	20	0.38
1986	91	15	51	25	0.31
1987	83	23	33	27	0.27
1988	84	21	41	22	0.20
1989	60	19	23	18	0.38
1990	37	16	9	12	0.24
1991	51	28	4	19	0.38
1992	48	28	6	14	0.25
1993	67	31	17	19	0.29
1994	165	96	35	34	0.17
1995	211	131	39	41	0.26
1996	217	110	33	74	0.29
1997	307	174	41	92	0.26
1998	305	177	40	88	0.29
1999	278	130	48	100	0.21
2000	223	104	38	81	0.23
2001	177	82	24	71	0.22
2002	94	27	27	40	0.15
2003	143	46	34	63	0.23
2004	149	45	45	59	0.23
2005	108	25	30	53	0.21
2006	71	13	40	18	0.23
Total	3,049	1,367	692	990	0.24

Table 2
Acquirer and target firm characteristics before the merger

The sample consists of 1,367 stock acquisitions and 692 cash acquisitions during 1985-2006. This table reports the median of the following firm characteristic and performance variables at the fiscal yearend before the merger announcement: assets (Compustat data item 6), sales (data12), market-to-book value of assets $((\text{data24} \times \text{data25} + \text{data6} - \text{data60}) / \text{data6})$, price-to-earning ratio ($\text{data24} / \text{data58}$), book leverage $((\text{data9} + \text{data34}) / \text{data6})$, operating ROA ($\text{data13} / \text{average total assets of fiscal year } t-1$), asset turnover ($\text{data13} / \text{data12}$), sales growth from fiscal year t-2 to fiscal year t-1, and the market-adjusted 12-month stock return (the buy-and-hold return during the 12 months prior to the announcement divided by the contemporaneous CRSP valued-weighted market return). Assets and Sales are adjusted by CPI index to dollars of 2006.

Variables	Stock Acquisitions		Cash Acquisitions	
	Bidder	Target	Bidder	Target
Assets (\$ million)	1,898	327	2,239	185
Sales (\$ million)	668	105	1,545	155
M/B assets	1.40	1.22	1.41	1.25
P/E ratio	16.3	13.5	15.0	12.2
Book leverage	0.16	0.11	0.19	0.13
Operating ROA	0.11	0.11	0.14	0.12
Asset turnover	0.49	0.56	0.84	1.08
Sales growth	0.14	0.10	0.09	0.06
Market-adjusted 12-month return	0.08	-0.02	-0.01	-0.02

Table 3
Overvaluation of merging firms before the announcement

This table presents two measures of overvaluation for the merging firms during the period of 1985-2006. The first one is derived under the method proposed by Rhodes-Kropf, Robinson, and Viswanathan (2005). The market-to-book equity ratio is decomposed into two components: misvaluation and long-run investment opportunities, $Ln(M/B) = Ln(M/V) + Ln(V/B)$. The second measure, the industry-median-adjusted overvaluation, is calculated as $Ind-adj\ OV = ((M/B)_{it} - (M/B)_{jt}) / (M/B)_{jt}$, where $(M/B)_{it}$ is the market-to-book equity ratio of stock i at t , and $(M/B)_{jt}$ is the median market-to-book equity ratio of industry j , to which stock i belongs at t . A positive value suggests overvaluation and a negative value suggests undervaluation. The sample consists of 1,339 stock mergers and 664 cash mergers. The table reports the mean values for $Ln(M/B)$, $Ln(M/V)$ and $Ln(V/B)$ and the median for $Ind-adj\ OV$ due to its significant skewness. The last three columns report the differences in valuation ratios between groups. Statistical significance is tested by t -test for the difference in means and by Wilcoxon sign rank test for the difference in medians. A statistical significance at the 1% level is marked by *.

Valuation component	Bidders	Stock bidders	Cash bidders	Targets	Targets of stock bidders	Targets of cash bidders	Stock bidders - Cash bidders	Stock bidders - Stock targets	Cash bidders - Cash targets
$Ln(M/B)$	1.03	1.17	0.78	0.75	0.83	0.60	0.39*	0.34*	0.18*
$Ln(M/V)$	0.49	0.58	0.32	0.14	0.19	0.05	0.26*	0.39*	0.27*
$Ln(V/B)$	0.54	0.59	0.46	0.61	0.64	0.56	0.13*	-0.05*	-0.10*
$Ind-adj\ OV$	0.30	0.36	0.18	0.10	0.15	-0.02	0.18*	0.19*	0.20*

Table 4
Relative overvaluation of stock-financed merging firms

This table presents the relative overvaluation between the bidder and the target one month before the merger announcement and on the date of merger completion. It also shows the change in valuation ratios during the acquisition process for the two merging firms. Median values are reported in Panel B due to the skewness of *Ind-adj OV*.

Panel A: RKR V 's measure of overvaluation - $\ln(M/V)$

	Bidder	Target	Diff (Bidder - Target) (<i>p</i> -value)
Before the merger announcement	0.58	0.19	0.39 (<0.001)
On the date of merger completion	0.54	0.48	0.06 (0.033)
Diff (After - Before) (<i>p</i> -value)	-0.04 (<0.001)	0.29 (<0.001)	

Panel B: Industry-adjusted measure of overvaluation - *Ind-adj OV*

	Bidder	Target	Diff (Bidder - Target) (<i>p</i> -value)
Before the merger announcement	0.36	0.15	0.19 (<0.001)
On the date of merger completion	0.35	0.37	0.02 (0.036)
Diff (After - Before) (<i>p</i> -value)	-0.01 (0.004)	0.17 (<0.001)	

Table 5
Announcement period returns for acquirers and acquisition premium

This table presents acquiring firms' three-day [-1, +1] and full-period [-20, close], and target firms' [-42, close] cumulative abnormal returns (in %) relative to the acquisition announcement day. Target firms' CAR [-42, close] is interpreted as acquisition premium according to Schwert (1996). Close date is the completion date of the merger. Expected returns are estimated by the two-parameter market model where the CRSP valued-weighted index is regarded as the market portfolio. The parameters are estimated based on daily stock returns from trading days -253 to -45. The *p*-values in parentheses for the mean and median CARs are generated by the *t*-test and the Wilcoxon signed rank test respectively. Differences in mean and median CARs between groups are tested respectively by the two-sample *t*-test and Wilcoxon-Mann-Whitney test. The sample includes 446 stock mergers driven by stock overvaluation (OV), 446 stock mergers not driven by stock overvaluation (NOV), and 664 cash mergers during 1985-2006. The classification of acquisition groups are based on the relative overvaluation measures derived from the RKR method for Panel A and the industry-adjusted OV for Panel B.

Panel A: Acquisition group classification based on the RKR measure

	OV	NOV	Cash mergers	Diff (OV - NOV)	Diff (OV- Cash mergers)
<i>Three-day announcement abnormal returns [-1, +1]</i>					
Mean (<i>p</i> -value)	-3.81 (<0.001)	-2.47 (<0.001)	0.60 (0.023)	-1.34 (0.029)	-4.41 (<0.001)
Median (<i>p</i> -value)	-3.36 (<0.001)	-2.22 (<0.001)	0.22 (0.129)	-1.14 (0.045)	-3.58 (<0.001)
<i>Full-period abnormal returns [-20, close]</i>					
Mean (<i>p</i> -value)	-16.99 (<0.001)	-6.15 (0.005)	0.04 (0.970)	-10.84 (0.001)	-17.03 (<0.001)
Median (<i>p</i> -value)	-11.03 (<0.001)	-3.79 (<0.001)	-1.13 (0.619)	-7.24 (<0.001)	-9.90 (<0.001)
<i>Acquisition premium [-42, close]</i>					
Mean (<i>p</i> -value)	35.33 (<0.001)	19.87 (<0.001)	38.08 (<0.001)	15.46 (0.001)	-2.75 (0.398)
Median (<i>p</i> -value)	30.06 (<0.001)	17.12 (<0.001)	33.74 (<0.001)	12.94 (<0.001)	-3.68 (0.316)

Panel B: Acquisition group classification based on industry-adjusted OV

	OV	NOV	Cash mergers	Diff (OV - NOV)	Diff (OV - Cash mergers)
<i>Three-day announcement abnormal returns [-1, +1]</i>					
Mean (<i>p</i> -value)	-3.53 (<0.001)	-2.25 (<0.001)	0.59 (0.021)	-1.28 (0.033)	-4.12 (<0.001)
Median (<i>p</i> -value)	-3.20 (<0.001)	-2.03 (<0.001)	0.22 (0.156)	-1.17 (0.034)	-3.42 (<0.001)
<i>Full-period abnormal returns [-20, close]</i>					
Mean (<i>p</i> -value)	-14.55 (<0.001)	-6.69 (0.003)	0.20 (0.845)	-7.86 (0.009)	-14.75 (<0.001)
Median (<i>p</i> -value)	-11.06 (<0.001)	-2.62 (0.005)	-1.10 (0.654)	-8.44 (<0.001)	-9.96 (<0.001)
<i>Acquisition premium [-42, close]</i>					
Mean (<i>p</i> -value)	41.70 (<0.001)	15.38 (<0.001)	37.63 (0.521)	26.32 (0.001)	4.07 (0.194)
Median (<i>p</i> -value)	33.89 (<0.001)	15.45 (<0.001)	33.15 (0.307)	18.44 (<0.001)	0.74 (0.542)

Table 6
Acquisition synergies derived from stock returns

Synergies are calculated as the sum of acquirer and target's market value of equity prior to the announcement times their respective full-period CAR divided by the market value of equity of the merged firm at the month end of merger completion. To remove the effects of outliers, the value of synergies is trimmed at 1% and 99% for each group of mergers. The classification of acquisition groups are based on the relative overvaluation measures derived from the RKR method. The last row shows the percentage of diversifying mergers for each acquisition group. A merger is classified as a diversifying deal if the bidder and the target have different two-digit SIC codes. Chi-square test is used to test the difference in percentage.

Acquisition Synergies	OV	NOV	Cash mergers	Diff (OV - NOV)	Diff (OV- Cash mergers)
Mean (<i>p</i> -value)	-19.5 (<0.001)	-10.8 (<0.001)	2.8 (0.008)	-8.7 (0.026)	-22.3 (0.010)
Median (<i>p</i> -value)	-5.7 (<0.001)	-0.1 (0.042)	2.5 (<0.001)	-5.6 (<0.005)	-8.2 (<0.001)
Diversifying deals (%) (<i>p</i> -value)	35.0	28.3	43.5	6.7 (0.031)	-8.5 (0.004)

Table 7
Operating performance of mergers

Panel A reports the median operating performance of merging firms from fiscal year -3 to +5, where year 0 is the fiscal year that the merger is completed. Operating ROA is calculated as operating income before depreciation (Compustat data item 13) scaled by the market value of assets at the beginning of the fiscal year. The market value of assets is defined as the market value of equity, plus book values of preferred stock and debt net of cash. The operating performance before the merger is a weighted-average performance of the bidder and the target, with the weights being their relative market value of assets at the beginning of the fiscal year. Asset turnover is calculated as sales divided by the market value of assets. The classification of acquisition groups are based on the relative overvaluation measures derived from the RKR method. Panel B reports abnormal changes in operating performance after mergers, respectively based on Healy, Palepu, and Ruback's (1992) method and the size and pre-merger performance match method suggested by Barber and Lyon (1996). In Healy, Palepu, and Ruback's (1992), we match the operating performance of merging firms to their weighted-average industry median performance and calculate the abnormal performance. We then run a cross-sectional regression of the median post-merger abnormal performance on the median pre-merger abnormal performance. The regression intercept is estimated as the change in abnormal performance due to the mergers. In Barber and Lyon (1996), each merging firm is matched to a control firm that has total assets of 50%-150% and the closest operating ROA of the merging firm in the year before the merger. Control firms exist for at least three years and do not conduct SEOs and involve into acquisitions in the following five years. The benchmark performance for the merging firm is the weighted-average performance of the control firms.

Panel A: Median operating performance

Year relative to merger	OV		NOV		Cash mergers	
	Operating ROA	Asset Turnover	Operating ROA	Asset Turnover	Operating ROA	Asset Turnover
-3	11.81	63.97	14.56	66.00	15.35	116.60
-2	11.14	57.98	13.43	61.91	15.22	109.78
-1	9.93	46.89	11.58	55.72	15.03	104.57
0	9.70	44.75	12.86	59.34	16.29	117.99
1	8.24	39.50	9.79	47.76	13.84	95.20
2	7.85	38.42	9.55	42.99	12.85	97.43
3	8.39	37.41	9.44	43.83	12.73	93.70
4	9.07	41.62	8.75	39.87	12.34	89.78
5	8.94	43.00	9.46	36.02	12.76	94.76

Panel B: Abnormal change in operating performance after mergers

	OV	NOV	Cash mergers
<i>Healy, Palepu, and Ruback (1992)</i>			
Operating ROA	-0.65 (0.037)	-0.08 (0.860)	1.36 (<0.001)
Asset Turnover	-10.35 (<0.001)	-2.61 (0.385)	-0.09 (0.980)
<i>Barber and Lyon (1996)</i>			
Operating ROA	-1.73 (0.004)	-0.77 (0.037)	0.63 (0.610)
Asset Turnover	-10.25 (0.003)	-7.52 (0.002)	-1.93 (0.662)

Table 8
Changes in CEO compensation and wealth after acquisitions

The sample consists of 164 OV acquisitions, 122 NOV acquisitions and 198 cash acquisitions with available CEO compensation data from Compustat's ExecuComp. We require that CEOs be the same between the fiscal year before the acquisition announcement (ayr-1) and the fiscal year after the merger completion (cyr+1). Cash payment is the annual salary and bonus compensation. Grants are the total value of all restricted stock and options granted during the fiscal year. Cumulative grants are the value of grants from year ayr to year cyr+1. Portfolio value of equity is the market value of the CEO's existing holding of stocks and options at the fiscal year end. The last rows present the changes of value deflated by the acquisition deal value. Median values are reported. Dollar values are adjusted to 2006 dollars and are in thousands.

	OV	NOV	Cash mergers
<i>Year ayr-1</i>			
Cash payment	1,432	1,392	1,620
Grants	2,565	1,566	2,488
Portfolio value of equity	12,574	9,752	7,260
<i>Year cyr+1</i>			
Cash payment	1,626	1,544	1,805
Grants	4,371	3,172	2,831
Portfolio value of equity	15,123	11,500	10,894
<i>Change from year ayr-1 to cyr+1</i>			
Change in cash payment	281	271	276
Change in grants	956	676	25
Change in portfolio value	2,698	1,873	2,471
Cumulative grants	10,912	7,633	5,842
Change in portfolio value net of cumulative grants	-4,419	-1,686	-2,158
<i>Deflate changes of value by deal value (in %)</i>			
Change in cash payment	0.05	0.02	0.07
Change in grants	0.22	0.05	0.003
Change in portfolio value	0.25	0.15	0.36
Cumulative grants	2.36	0.68	1.89
Change in portfolio value net of cumulative grants	-0.71	-0.20	-0.42