# Accounting Rules? Stock Buybacks and Stock Options: Additional Evidence

By

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Comments Welcome

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### Abstract

This paper finds that CEO stock options influence the choice, amount, and timing of funds distributed as a buyback. These results support two research expectations–that buybacks impose option-induced agency costs on outside shareholders, and that managers benefit from weak governance and unclear accounting in this choice. Increased CEO insider selling following a buyback also supports this agency cost perspective. Once we control for these option-related factors, we find no evidence that buyback activity associates reliably with EPS accretion from the reduction in common shares. We conclude that the popular use of buybacks as a form of cash distribution derives significantly from a strong contemporaneous relation between stock buybacks and CEOs' use of stock options as compensation.



**JEL Classification:**
G12, G30, G32, G34, G35, J33, M41.

**Keywords:**
Stock buybacks, stock options, unclear accounting rules, corporate governance, agency costs, management compensation, market reaction.

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## 1. Introduction

U. S. companies spent almost one trillion dollars on stock buybacks in 2007, a record amount that exceeded dividends paid and approximated almost two-thirds of net income that year. Also, since 2000, those same companies used buybacks to return well over three trillion dollars to shareholders. By any measure, these amounts evidence a substantial distribution of cash to shareholders. This paper focuses on why executives and boards spend such substantial sums. We posit below that, among several factors, CEOs' stock options and accounting rules, both of which have changed since 2000, play a key role in this regard. Our results support two primary research expectations: first, that the choice and amount of a buyback relate significantly to CEOs' option compensation and, second, that this relation is further influenced by weak governance and unclear accounting. Both relations create agency costs–in the former case from conflicts of interests and in the latter case as a result of accounting arbitrage.[1] Also, once we control for these factors, we find no evidence that buyback activity associates reliably with the EPS accretion from a reduction in common shares, as reported in some earlier studies.

First, we model the company choice to repurchase shares or pay additional dividends. Second, we examine the determinants of the dollar amount and the number of shares repurchased. Third, we investigate the timing of the link between buybacks and stock option compensation. Fourth, we test

[1] We view *accounting arbitrage* as a form of regulatory arbitrage, whereby a regulated company seeks an advantage from the difference between its real or economic risk and the regulatory position. In keeping with this view, we define accounting arbitrage as the economic benefit–as reflected in agency costs–conferred on managers and others from the application of accounting rules and regulations; in this case, those related to stock buybacks and stock options. Such accounting rules and regulations need not be improper.

for factors to explain investor reaction to a buyback announcement. Fifth, we examine how option-induced agency costs might influence the relation between shares repurchased and CEO insider trading around a buyback.

These analyses generate the following results. First, the number of exercisable stock options and those held by the CEO and a lower option exercise price increase the likelihood that a company chooses a buyback over a dividend increase. Buyback companies also exhibit higher CEO compensation and proxies of weaker corporate governance than dividend increase companies. Second, when we focus on the determinants of buybacks, we find that buyback outlay associates positively with CEO compensation and the number of options granted to and exercisable by the CEO. Third, the link between buybacks and stock option exercise in general and by CEOs in particular reflects a contemporaneous rather than a sequential relation. Fourth, while the average three day excess stock return around a buyback announcement is 1.78 percent, investors discount this response for companies with higher option grant values and higher CEO compensation. Investors also experience significantly negative stock returns six months around the announcement (other than a significantly positive announcement effect), so that the average outside shareholder receives no benefit. Fifth, we show that underperforming buybacks, which unclear accounting and disclosure rules may encourage, associate reliably with higher option benefits for the CEO. We find no evidence, on the other hand, that buyback activity associates reliably with the EPS accretion from the buyback. Sixth, we find that elevated insider selling by CEOs following a buyback relates positively to the buyback amount, which further supports the view that CEOs use buybacks as a means to enhance compensation through stock options. Collectively, these results are new to the literature.

### 1.1 Related literature

We build upon an extensive literature about what drives companies to choose a buyback and how the stock market reacts to buyback announcements.[2] Buyback proponents advance several reasons for a buyback, such as taxes, takeover deterrence, financial restructuring, payout flexibility, signaling, undervaluation, free cash flow, earnings per share (EPS) management, and, more recently, stock option compensation.

Several studies (Dann 1981, Vermaelen 1981, Ofer and Thakor 1987, Bartov 1991, Comment and Jarrell 1991) emphasize the use of a buyback as a costly signal to reduce information asymmetry between managers and outsiders. Some cast this as an undervaluation problem. Similarly, managers may use a buyback to signal their intention to distribute excess free cash flow to shareholders that might otherwise create agency costs from unwise or inefficient decision making (Jensen 1986, Nohel and Tarhan 1998, Oded 2005, Chan et al. 2006). These studies document a positive, short-window market response of about 3-4 percent to open market repurchase (OMR) announcements in the 1980s (Vermaelen 1981, Ikenberry et al. 1995), which declines to about 1-2 percent for OMRs in the 1990s (Kahle 2002). Studies of the longer-term impact of buybacks also show positive returns (45 percent excess return over four years for undervalued shares (Ikenberry et al. 1995) and 21 percent over three years for Canadian companies (Ikenberry et al. 2000). These studies relate the positive returns to favorable subsequent events (e.g., successive earnings surprises); although their results, based on

[2] For comprehensive reviews, see Dittmar (2000), Grullon and Ikenberry (2000), and Weston and Sui (2003). Our literature review is not intended to cover the entire field (or array of motivations for a buyback); which dates back at least to Ellis and Young (1971) on the costs and consequences of buybacks. Open market repurchases, for example, could be used as a takeover deterrent (Billett and Xue 2007).

post-buyback returns, have been scrutinized on methodological grounds (Mitchell and Stafford 2000).

A second set of studies (Bens et al. 2003, Hribar 2006, Lewis and White 2007, Balachandran et al. 2008, Gong et al. 2008) relates buybacks to companies' efforts to manage EPS or return on equity (ROE). EPS rises when the buyback reduces weighted average shares (the denominator in the calculation of EPS) more than it reduces net income (e.g., from foregone interest income). ROE (net income divided by shareholders' equity) also rises when the reduction in shareholders equity from the buyback (e.g., from Treasury or cancelled shares) more than offsets the reduction in net income.[3] Managers may use such "improved" accounting numbers to reinforce their optimism about the company's future prospects and to buttress the undervaluation problem.

A related set of studies concentrates on the use a buyback to counter the dilutive effects of exercised or exercisable stock options. Under the Treasury stock method of calculating diluted EPS, outstanding stock options increase weighted average common shares, which decreases EPS. A buyback, on the other hand, decreases weighted average common shares, which increases EPS (subject to foregone interest income). Bens et al. (2003) find a positive relation between buybacks and exercisable stock options for this reason. Lee and Alam (2004) also find a positive association between EPS dilution from stock options and the probability of a buyback. Balachandran et al. (2008) report evidence of accruals management prior to a buyback when such companies have exercisable options, presumably to enhance payoff and return to option holders.

However, if investors view buybacks as a form of earnings management, then they will reduce

[3] ROE is also inflated because the buyback at current market prices offsets shareholders' equity at book value, that is, the sum of the recognized assets less recognized liabilities.

the positive effects of signaling by the negative effects of earnings management. Hribar et al. (2006) report that investors discount buyback-induced EPS accretion around an earnings announcement.

A third strand of the literature (Bartov et al. 1998, Jolls 1998, Weisbenner 2000, Fenn and Liang 2001, Kahle 2002, Gumport 2006, 2007) links buybacks to stock options granted to managers and boards as compensation. Jolls (1998) contends that managers with stock options disfavor dividends because buybacks do not dilute company per share value, whereas dividends do. In this case, dividends decrease the value of stock options held, and hence present and/or future management option compensation. Stock options also disfavor dividends because buybacks do not usually affect explicitly the number and exercise price of exercisable options held (or expected to be held) by managers, whose values increase following a non-negative stock price trend after the buyback.[4] This also adds to management option compensation. We test whether such option compensation explains the choice of a buyback over a dividend increase and the value and number of shares repurchased.

This third strand, however, with the exception of Gumport (2007), overlooks how weak governance and lax accounting and reporting for buybacks might help managers enhance their compensation and, hence, exacerbate the agency costs from option-induced compensation through

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[4] A review of companies' proxy statements, which contain details of executives' compensation plans, reveals that companies at best include a clause in their plans whereby the board (e.g., compensation committee) may make adjustments to incentive compensation with respect to exchanges, distributions, and redemptions of the stock. Biogen Idec makes a typical disclosure in its 2008 Pre 14a regarding possible adjustment for a repurchase. "The following shall be equitably adjusted: (a) the number of shares that may be delivered …, the number and kind of shares of stock or securities subject to Awards then outstanding or subsequently granted, (c) exercise prices or base values, as the case may be, relating to outstanding Awards, and (d) any other provision of Awards affected by such change shall be adjusted by the Company *to the extent the Committee shall determine, in good faith, that such an adjustment is appropriate*." (emphasis added). http://www.sec.gov/Archives/edgar/data/875045/000095013508002596/b67068bipre14a.htm.

buybacks. We test whether such factors may help explain the current levels of buybacks. We posit this explanation as an alternative to the traditional view that buybacks increase option payoff to managers as a result of EPS accretion–a view that prevails in much of the literature (Bens et al. 2003, Hribar 2006, Lewis and White 2007, Balachandran et al. 2008, Gong et al. 2008). An explanation follows.

Consider, first, how and what companies report regarding buyback performance, which managers and boards consider as in the shareholders' best interests. Virtually nothing flows through the income statement or comprehensive income regarding such transactions, as would be the case with debt, for example, gains and losses on debt extinguishment (FASB Statement 145). Similarly, virtually nothing flows through the income statement or comprehensive income when a company reissues shares initially purchased as treasury stock.[5] Such relative opacity in calculating and reporting the gain or loss from shares repurchased at a discount, for example, to combat perceived market undervaluation, or at a premium, for example, to combat earnings dilution from stock option exercise (because a higher stock price encourages stock option exercise), does little to protect outside shareholders from unwise buybacks.[6]

Outside shareholders, also, may have little notion of how buybacks interact with compensation contracts. While financial statements reveal much about option valuation methods and the calculation

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[5] For purchased treasury stock later re-issued at a price less than the price paid at the time of the buyback, companies typically recognize the difference as a decrease in retained earnings and, occasionally, as a decrease in additional paid-in capital.

[6] Weston and Sui (2003) report that for ten OMRs initiated in 1999 totaling $55.9 billion, the repurchase cost based December 15, 2000 prices would have been lower by $13 billion. By October 9, 2002, the cost based on closing prices would have been lower by $31 billion, or a loss of 55% of the initial value.

of option expense, by contrast, statutory filings (e.g., Form 10-K, Def 14a proxy statement) require virtually no disclosure about the potential adjustment of option exercise price conditional on a buyback and the expected shareholder cost of not adjusting the option grant price conditional on a buyback. Boards also offer little solace to outsiders in this regard, since their incentives tend to coincide with management, as they too receive stock options as part of their compensation, whose value may increase absent a grant price adjustment.

Additionally, management and boards receive limited safe harbor under SEC Rule 10b-18, which protects them from Rule 10b-5 liability under certain conditions; for example, buybacks not deemed fraudulent or manipulative or not based on material non-public information. Rule 10b-18 may also shield them from the consequences of biased accounting or weak governance. We are not aware of SEC or private securities litigation asserting a violation of Rule 10b-18, and so such rule may do little to alleviate managers' incentives to use buybacks to exploit information asymmetry. The SEC in 2008 eased the Rule 10b-18 restrictions, with a resulting jump in buybacks over earlier levels.[7]

The view that buybacks and stock options interact to create agency costs because of weak governance or unclear accounting raises a broader question about the kind of equilibrium setting in which this might occur. Are the empirical relations we document in this paper the product of efficient compensation arrangements or the result of practices that encourage managers to use accounting rules

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[7] To provide more liquidity to markets, the SEC in mid-September 2008 eased the timing and volume conditions of Rule 10b-18 for safe harbor to allow companies more flexibility to repurchase their own stock. Within a few days of the Release, Microsoft announced a program to repurchase up to $40 billion in shares (September 22), Nike announced a similar program to purchase up to $5 billion in shares (September 22), and 3Com announced a program to purchase up to $100 million in shares (September 24) (SEC Release No. 34-58588, September 18, 2008). In October 2008, companies announced 155 buybacks, which is an 84% increase over July 2008 (84 announcements).

for short-term gain? Both views have their proponents.

While the literature thus far (e.g., Jensen et al. 2004) mostly links such agency costs to compensation and governance practices, hence solving the agency problem by improving such practices, Bolton et al. (2006) offer an alternative to this view. Their model explains that it can be optimal in equilibrium to design a compensation plan (and governance practices) to encourage CEOs to make short-term gains from holding stocks (and stock options) consistent with the beliefs of investors who price shares to reflect both a short-term speculative component as well as a long-run component. One benefit to such shareholders (including manager-shareholders) would be a short-term strategy to lower the cost of equity capital through the sale of stock whose price is inflated from speculation. Hence, it could be optimal in equilibrium for a compensation/governance arrangement to not only encourage buybacks over dividends but, also, encourage the use of unclear accounting and disclosure rules to enhance agency benefits for managers.[8]

To summarize, unclear accounting, weak governance, and safe harbor may promote a form of accounting arbitrage. We posit and test the possibility that managers' and boards' use of these factors increases agency costs from the relation between buybacks and stock options. We contrast this explanation with the view that managers use buybacks for EPS accretion to combat the dilution from employee stock option exercise. Our research expectation is that the latter view should now be of less

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[8] For example, consider the disclosure in Biogen Idec's 2008 Pre 14a filing (which is similar to many other companies), a portion of which is extracted in note 4 to this paper. That disclosure states that an adjustment to the incentive shares awarded in the event of a buyback (or other share changes) shall only be made if the compensation committee "determines, in good faith, that such an adjustment is appropriate." (page A-8). Contrariwise, a board or board committee may determine that an adjustment is not appropriate. Biogen Idec's plan, even though it allows for opportunistic behavior, could indeed be in good faith and efficient from the board's standpoint.

concern because the use of employee stock options has moderated in recent years relative to other forms of performance-based compensation, partly in response to FASB Statement 123R. EPS accretion from buybacks also appears to have declined in recent years (see subsection 2.2).

In sum, our study builds on the empirical literature that relates buybacks to stock option and management compensation.[9] We test the applicability of earlier studies to a more recent period by examining buybacks in 2005 through 2007. This recent period should be more representative of current conditions, and thus a better guide for managers and investors.

Our study continues as follows. Section 2 outlines the data and describes the samples and methods. Section 3 reports the results of least squares and logistic regressions. Section 4 describes other tests and analyzes the robustness of the results. Section 5 summarizes and draws conclusions.

## 2. Data, samples, and methods

### *2.1 Data and samples*

We derive an initial sample by merging the annual industrial CRSP/Compustat data base (excluding banks and other depository institutions) with the CEOs and Directorships file from the Corporate Library for fiscal years 2005 through 2007.[10] This procedure results in a maximum of

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[9] The financial press has voiced similar arguments about the compensation and accounting-induced agency costs of buybacks (Taub 2005, Lehman and Hodgson 2006, Morgenson 2006, Myers 2006, Shaw 2006, Audit Integrity 2007, MacDonald 2007). Several articles spotlight the timing of insider sales (from earlier stock grants). For example, Audit Integrity (2007) reports that Nutrisystem repurchased $45.4 million in 2006 but insiders made $134.9 million selling stock in the same period of the buyback. Sub-section 4.1 examines the relation between stock buybacks and CEO insider trading for our sample.

[10] We exclude regulated depository institutions because their capital requirements (and high leverage) restrict their ability to repurchase shares. Regulated depository institutions comprise approximately 26% of the Compustat population and 25% of the companies in the Corporate Library data sets.

7,985 company-year observations for total assets (Compustat data item, *at*) and a minimum of 2,938 company-year observations for options granted to the CEO (from the Corporate Library). We use these company-year observations to compare and explain differences between buyback companies and dividend increase companies.[11] We compare buybacks to the latter group, as a dividend increase is the natural alternative when companies have excess cash to distribute to shareholders (also known as the substitution hypothesis). Moreover, as the large majority of firms repurchase shares as an OMR (94 percent according to Grullon and Ikenberry 2000), our initial descriptive results essentially relate to this form of repurchase. When we add the restriction that each company must have complete data for all variables (up to 18) in the regressions in tables 3 and 4, the sample size decreases to a maximum of 1,179 observations, comprising 561 stock buybacks and 618 dividend increases spread reasonably evenly across 2005-2007.

We also obtain a file from iMiners.com of 2,163 buyback company announcements in 2006 and 2007 of which 92.6 percent are planned or actual OMRs[12], which we then merge with the CEOs and Directorships file and CRSP/Compustat to derive an OMR buyback announcement sample. This second sample comprises 899 common stock OMR buyback announcements in 2006-2007 after we require complete data for all company variables (up to 10) in the announcement analysis in table 6.

The most restrictive constraint is that we require data about CEO options and other CEO variables in our regression models. For example, whereas for fiscal years 2005-2007 we have 5,983

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[11] Note 14 states the definition of a buyback and a dividend increase company.

[12] Of the remaining news releases, 3.3% relate to accelerated buybacks, 1.9% to Dutch auction buybacks, and 2.2% to debt redemption transactions. Some news releases that state that the company intends to repurchase shares in the open market also state that the company may use "other means "such as privately-negotiated and block repurchases.

company-year observations for "options exercisable at the end of fiscal year" (including 2,026 for buyback companies) (Compustat *optx*), we have only 2,953 company-year observations for the "options exercisable at the end of fiscal year held by the CEO" for the same period, of which only 930 are for CEO option holdings for a buyback company. Other studies report similar reductions in sample size due to data constraints, primarily a lack of CEO option data. For example, Jolls (1988) examines 44 buybacks in fiscal 1993 with CEO option compensation; Kahle (2002) studies 712 buybacks over six years (1991-1996); Balachandran et al. (2008) examine 138 buybacks over eight years (1996-2003).

### *2.2 Sample characteristics*

We describe the sample and data first, in terms of macro trends, second, as an industry analysis, and, third, by various financial characteristics. First, untabulated analysis shows that total dollar repurchases ($\sum$*prstkc-prstkp*) for the CRSP/Compustat companies increase from $221 billion in 2000 to $990.3 billion in 2007. The percentage of total share repurchases to total common equity ($\sum$*prstkc-prstkpc*÷$\sum$*ceq*) also increases, from 6.8 percent to 12.6 percent over the same period and, similarly, the mean ratio of shares repurchased to net income (*prstkc-prstkpc*÷*ni*) per company increases steadily from 31.3 percent in 2000 to a high of 51.8 in 2007. These trends alone justify a reexamination of the factors that might explain such a shift, since most of the published work on buybacks relates to the early 2000s. We note a similar conclusion by Skinner (2008, p. 582): "Firms that only pay dividends are largely extinct. Repurchases are increasingly used in place of dividends, even for firms that continue to pay dividends."

The trends in stock options do not parallel those for buybacks, however. Untabulated analysis

shows the mean number of stock options granted per company (*optgr*) decreases from 2005 (1.81 million) to 2007 (1.51 million), although the mean fair value of those options (*optfvgr*) increases (from $7.52 to $8.67 per share), as does the mean ratio of CEO options exercisable to total options exercisable (from 1.86% to 2.38%). We contend that the divergence in stock option trends generally and for CEOs derives from the view that CEOs in the more recent years receive or expect to receive a greater benefit from stock option compensation through the option-induced benefit from a buyback.

Our trend analysis also shows a decline in EPS accretion (i.e., the mechanical increase in EPS from a reduction in shares outstanding in the numerator of the EPS calculation). We calculate *EPS accretion* similarly to Hribar et al. (2006) by taking the difference between actual EPS and "as if" EPS, that is, estimated EPS without the buyback.[13] In untabulated analysis, we observe that the mean ratio of *EPS accretion* to buyback outlay (in millions) per company declines from a high in 2002 of 6.37 percent to a low in 2007 of 3.17 percent. Similarly, the mean ratio of *EPS accretion* to total assets (in millions) declines to an all-time low in 2007. Possible explanations include the diminished role of employee stock options and enhanced awareness by investors of EPS accretion as an earnings management tool. Also, Skinner (2008) finds no evidence that EPS dilution explains differences between buyback and dividend increase companies.

Second, we examine the industry composition of the buyback sample. Table 1 compares 9,536 buyback companies with 6,238 dividend increase companies and 24,632 others (non-buyback, non-

[13] The calculation is: "as if" EPS = $(ni_t + C_t) \div (csho_{t-1} + 50\% \text{ x common shares issued}_t)(sstk_t - spstkc_t)$, where $C_t$ = the average three-month Treasury bill rate during the year x 50% x dollar repurchases during t ($prstkc_t$-$prstkpc_t$) (assumed to occur at mid-year).

dividend increase) in the CRSP/Compustat population and in the 2005-2007 sub-periods.[14] While the overall distribution of companies in the later years (2005-2007) is similar to that of the entire period (2000-2007), the distribution of industries for buyback companies differs in some respects to that of dividend increase companies. More buyback companies are in "newer" industries such as information, which includes high technology (16.1% versus 8.4%) and professional services (6.9% versus 3.0%), whereas fewer buyback companies are in utilities (0.5% versus 4.0%), real estate (3.8% versus 11.6%), and other "traditional" industries (e.g., wood, paper, petroleum, plastics, and chemicals manufacturing). Earlier studies show similar results (Kahle 2002).[15]

Our third analysis compares buyback with dividend (and dividend per share) increase companies along 18 dimensions. Table 2 presents the per company means and medians for the two sub-samples and reports a t test of the difference in means. We list the definition and data source of these descriptive variables below.

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[14] We define a buyback company in year t as one when $prstkc_t$-$prstkpc_t > 0$, otherwise zero. We define a dividend increase company as one when $(dvtotal_t \div dvtotal_{t-1})-1$ for $1\% < (dvtotal_t \div dvtotal_{t-1})-1 < 100\%$, otherwise zero. If both variables are greater than zero, we assign the observation to the dividend increase group. We also compare a buyback company with a dividend *per share* increase company to adjust dividends for the changing number of shares from the issuance of new shares or the repurchase of existing shares. According to Banyi et al. (2008), Compustat has the lowest rate of data error relative to other data sources of share repurchases. Also, "Compustat purchases of common stock is the only measure of repurchases that is not offset by concurrent stock issues, so it is the most accurate measure of repurchases for firms with high option redemption." (p. 461).

[15] Bank and other depository institutions, which we exclude from the samples, also display a strong preference for dividend increases versus buybacks. For example, 26.4% of the Corporate Library company-year bank observations are dividend increase companies and 13.7% are buyback companies.

Descriptive variables, definitions, and data sources

| Variable | Definition | Primary source |
|---|---|---|
| Market value of common shares outstanding | *mkvalt_f* | Compustat |
| Total assets | *at* | Compustat |
| Market value of comm. stock to total assets | *mkvalt_f÷at* | Compustat |
| Net income to common equity | *ni÷ceq* | Compustat |
| Long-term debt to total assets | *dltt÷at* | Compustat |
| Operating free cash flow to total assets | (*oibdp - txc - dvc - dvp-capx*)÷*at* | Compustat |
| Log of total assets (in millions) | Log of *at* | Compustat |
| Percentage of insiders owning comm. stock | Direct | Corporate Library |
| Percentage of five percent owners | Direct | Corporate Library |
| CEO total compensation to total assets | *ceototalcomp÷at* | Corporate Library |
| Number of outside directors | Direct | Corporate Library |
| CEO age | Direct | Corporate Library |
| Common shares outstanding (csho) | *csho* | Compustat |
| Options granted to csho | *optgr÷csho* | Compustat |
| CEO options granted to csho | *ceooptgr÷csho* | Corporate Library |
| Options exercisable to csho | *optex÷csho* | Compustat |
| CEO options exercisable to csho | *ceooptex÷csho* | Corporate Library |
| Option grant price to csho | *optprcgr÷csho* | Compustat |

Table 2 shows that buyback and dividend (and dividend per share) increase companies differ along several dimensions. First, buyback companies are smaller in market value and total assets, less profitable (because dividend increase companies typically must distribute from earnings and profits), and less levered with long-term debt (because lower leverage implies fewer constraints on distribution choices). Buyback companies also associate with other characteristics such as fewer outside directors and a higher percentage of insiders and five percent owners. The remainder of table 2 relates to the link between buybacks and stock option compensation. Buyback companies pay higher overall CEO compensation, have more exercisable, exercised, and granted stock options in general, and also have more exercisable, exercised, and granted options to the CEO, in particular. Moreover, the option

grant price is significantly lower for buyback companies as a group.[16] Overall, these univariate differences reflect the expected positive relations between buybacks and stock option compensation.

## 3. Multivariate results

### *3.1 Explanation of buyback versus dividend increase*

Table 3 presents the results of OLS and logistic regression to explain differences in companies that distribute funds as a buyback versus a dividend increase.[17] We conduct this analysis, first, to explain the sample differences in a multivariate context and, second, to establish a first-stage control for possible endogenous self-selection bias in our analysis of buyback activity. We use the Heckman (1979) procedure for this purpose. We set the dependent variable to one for a buyback and zero for a dividend increase company. We then select three categories of explanatory variables from those in table 2: (a) signaling variables–net income, debt, assets, and free cash flow, (b) governance variables–outside directors, five percent owners, and insiders, and (c) eight option and compensation variables. Following our earlier discussion, we hypothesize that the coefficients for the option and compensation variables, with one exception, should be positive, reflecting our contention that managers use buybacks to increase option compensation in preference to a dividend increase, which can lower stock option value. The exception is the coefficient for option grant price, which we hypothesize should be negative, as a lower grant price enhances option value and, hence, management compensation.

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[16] In untabulated analysis, we also find that *EPS accretion* is significantly higher for buyback versus dividend increase companies in all years 2000-2007. This was expected. Dividend increase firms in our analysis experience a random accretion effect only, as we apply the same "as if" EPS formula (defined in note 13) to both sub-samples.

[17] While the significance tests for the OLS and nominal logistic models should be virtually the same (Pohlmann and Leitner 2003), we present results for both models for those more familiar with one method versus the other.

First, the results in table 3 for the signaling variables confirm prior research. Buyback companies are less profitable (*Net income to common equity*) and smaller in size (log of *total assets*), and report more free cash flow (*Operating free cash flow - capital exp. to total assets*). Leverage (*Long-term debt to total assets*) and growth opportunities (*Market-to-book ratio*) have no additional power to explain the choice between a buyback and dividend increase. Second, the governance variables in table 3 show that buyback companies have fewer *Outside directors*, a smaller percentage of *Common shares held by institutions*, and a larger number of *Five percent owners*. These results indicate that proxies of weaker governance reliably associate more with buyback than dividend increase companies.

Third, consistent with research expectations, we observe mostly significant and positive coefficients for the option and compensation variables. Buyback companies grant significantly more options in general (*Options granted*) and to CEOs in particular (*CEO Options granted*).[18] Buyback companies also report significantly more exercisable options (*Options exercisable*). *CEO options exercisable* shows an insignificant coefficient, however, in the multivariate regression, although this factor is significant in table 2. Also, buyback companies reflect a lower *Option grant price*, which increases management compensation (*CEO total compensation to total assets*). Additionally, buyback companies have younger CEOs (*CEO age*), which we conjecture makes option expiration less binding for an active executive. In short, table 3 shows that most stock option variables, including the CEO variables, significantly explain a company's choice of a buyback over a dividend increase.

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[18] We omit the variable deflator *csho* for convenience here and elsewhere in the study.

We also estimate OLS and logistic regressions with unit variables for year–fiscal 2006 and 2007– and industry–information (NAICS two digit code 52) and utilities (NAICS two digit code 22). Untabulated analysis indicates significantly positive year coefficients, consistent with an increasing use of buybacks over dividends after 2005. The industry coefficient is significantly positive for the information industry (favors a buyback) and significantly negative for utilities (favors a dividend increase). We observe no material changes in the sign or significance of the other coefficients after controlling for these fixed effects.

Further, the addition of *EPS accretion* to the regressions yields no significant explanatory power. In other words, after considering the signaling, governance, and compensation variables, accretion in EPS adds nothing further to the models. This result supports the view that such accretion factors are already reflected in the regression models by way of positive and significant coefficients for granted and exercisable options and CEO compensation.

Finally, we run the regressions including total options unexercisable, defined as total options outstanding minus exercisable options divided by common shares outstanding. We also define options unexercisable by the CEO in the same way using the Corporate Library data. These variables should have limited influence on the choice of a buyback because they are unexercisable. Untabulated analysis shows that these variables add no additional power to the regressions. However, because they are correlated with exercisable options, their inclusion reduces the significance of the expected positive coefficient on CEO options granted, which is now less significant–at a probability level of 13.4 percent–versus 7.11 percent (OLS) and 6.70 percent (logistic) for CEO options granted in table 3. The significance levels of the other variables in these expanded regressions remain

qualitatively unchanged. Overall, our interpretation of the regressions remains the same as in table 2. Stock options in general, CEO stock options in particular, and CEO total compensation contribute significantly in distinguishing a buyback company from a dividend increase company. Accretion in EPS from a buyback does not contribute to such distinction.

### *3.2 Regression explanation of buyback outlay*

This subsection focuses on buyback companies only and examines factors that explain buyback outlay. We use the log of common shares repurchased (log of Compustat variables *prstkc-prstkpc*) as the dependent variable. A log transformation reduces outliers and generates a more symmetric distribution than common shares repurchased deflated by total assets (as used in some studies). We also log transform certain independent variables for the same reason.

Table 4 presents the results of three regressions: (a) all buybacks, (b) all buybacks with year indicator variables, and (c) all buybacks with positive EPS accretion. Each regression includes the *Inverse Mills ratio* as per Heckman (1979) to control for endogeneity in repurchase decision in testing our model of buyback outlay. First, as expected, buyback outlay increases with company profitability (*Net income to common equity*), free cash flow (*Oper. cash flow – cap. exp. to total assets*), and company size (Log of *total assets*), and decreases with leverage (*Long-term debt to total assets*). We also observe a mostly insignificant positive coefficient for *Market-to-book ratio*, which could reflect either a negative relation (the greater the company growth opportunities the more likely funds will be invested internally rather than paid out) or a positive relation (the buyback is more expensive per unit of book value or share reduction).

Most of the remaining variables in table 4 relate to stock option and CEO compensation.

Buyback outlay associates positively with *CEO total compensation*, *CEO options granted*, *CEO options exercisable*, and *Option grant price*, and negatively with *CEO age*. Total *Options granted* and total *Options exercisable*, however, add no additional explanatory power beyond the CEO option variables. In other words, whereas both total options and CEO options influence the payout choice of buyback versus dividend increase, the CEO option variables dominate the explanation of buyback outlay. This result differs from Kahle (2002, p. 250), who finds that the CEO option variables drive only the decision to repurchase and not the dollar amount of shares repurchased. We also note that while dividend increase companies grant options with higher grant price than buyback companies (table 3), *Option grant price* still relates positively to buyback outlay due to a positive association between grant price and buyback share price. Many companies, for example, grant options with grant price equal to share price on grant date. Regression 2 of table 4 also shows positive coefficients for indicator variables *Year 2006* and *Year 2007*, consistent with the trends noted earlier (subsection 2.2), and insignificant coefficients for the *Inverse Mills ratio*, suggesting that selection bias has no significant bearing on the results.

Finally, when we analyze a reduced sample of buybacks with higher than median *EPS accretion* (regression 3), only the option variables *Options exercisable* and *CEO options exercisable* have significant explanatory power. The other option variables, while mostly positive as expected, are not significant. Also, when we add *EPS accretion* as an additional variable in regressions 1 and 2, untabulated analysis shows insignificant *EPS accretion* coefficients. In other words, whether as a separate regression or as an additional independent variable, *EPS accretion* does not significantly explain the dollar amount of the buyback beyond the other variables. Management appear to be

driven by more fundamental factors (that achieve an $R^2$ of approximately 50 percent) rather EPS accretion, which the next section suggests arises as a result of rather than a precursor to a buyback.

### *3.3 Timing relation between options exercised and reduction in common shares*

Though buybacks can occur prior to, contemporaneously with, or following option exercise, a non-contemporaneous relation posits a directional link, for example, that buybacks follow stock option exercise to accrete EPS diluted from stock option exercise. On the other hand, if option compensation and stock buyback were mutually rather than sequentially determined, such relation should be strongest contemporaneously.

To investigate this, we estimate the link between a reduction in common shares outstanding (from the buyback) in year t and stock option exercise in year t-1, t, or t+1. Table 5 presents the main results. The dependent variable in the regressions is minus one times the log of the negative of the change in common shares outstanding from year t-1 to t divided by common shares at t-1. We define the variable this way so that a reduction in common shares converts to a positive number. We include most of the same factors in the regressions in table 3 and 4. As with the previous table, we include the Heckman (1979) *Inverse Mills ratio* in these regressions.

Table 5 shows highly significant coefficients for *Options exercised* and *CEO options exercised*, defined as a contemporaneous relation. When we re-estimate the regressions with stock option exercises in year t and buybacks in t-1 and t+1, untabulated analysis shows that the coefficients for *Options exercised*, while still mostly significant, are substantially less positive. As such, the relation between a buyback and stock option exercise is strongest contemporaneously rather than sequentially. The positive contemporaneous relation is also strongest for *Options exercised* in general and for the

CEO in particular. This result differs from Kahle (2002, p. 255), who finds that buybacks precede stock option exercise, and reasons that companies repurchase shares in t-1 to avoid *future* EPS dilution from stock option exercise in t to manage earnings, a view that seemingly presupposes that dilution avoidance is a primary reason for the buyback. Such reasoning, however, may be detrimental to managers' interests if investors recognize and discount this form of earnings management (Hribar et al. 2006). A contemporaneous relation supports the notion that managers consider buybacks and options jointly in an effort to increase option compensation and agency benefits. A contemporaneous relation also allows managers to match their cash outlay for stock option exercise with the proceeds from their repurchased shares.

Other results in table 5 buttress this view. For example, *Options unexercised* is not significant (unexercised options should not influence a buyback decision), and *Options exercisable* in general and by the *CEO Options exercisable* are also significant only as a contemporaneous relation. In sum, both CEO exercised and CEO exercisable options significantly explain the buyback-induced reduction in common shares. Other coefficients mirror the results in prior work. For example, we find a negative coefficient for *Market-to-book ratio*, consistent with the view that companies repurchase fewer shares when they are more expensive or when the company has higher growth opportunities.

### *3.4 Regression explanation of investor response to a buyback announcement*

We next examine whether options and compensation variables, which explain buyback choice (table 3), buyback outlay (table 4), and buyback share reduction (table 5), also explain investor response to a buyback announcement. Whereas the preceding tables support the idea that CEOs

achieve higher option compensation through buybacks, it is unclear whether investors recognize and assess lower returns for companies whose CEOs may extract such agency costs at their expense. We know from prior research that investors on average respond positively to buyback announcements, and our evidence is no different in this respect, although it is smaller than the average response in earlier studies. For our sample, the average company experiences a reliably significant three-day excess return of 1.78 percent (figure 1, panel a). Several earlier studies report a higher announcement effect, of 3.5 to 4.0 percent. But as figure 1, panel b, shows, such announcement effect is but a small spike in a longer term downward trend, especially in the pre-announcement period (90 days). Figure 1 also shows that such downward trend is greater for smaller companies and companies with higher CEO compensation. Stock trading also spikes around day zero, and we observe elevated trading several days prior to the announcement.[19]

To avoid estimation issues that can arise in interpreting excess return over longer intervals, we conduct a short-window event study. We regress the sum of excess stock return for days -1, 0, and 1 on factors that might explain that return, namely financial performance, pre- and post-announcement excess stock return, and measures for stock options and compensation. If investors discount companies with higher option compensation from the buyback, then the coefficient on the option compensation variables should be negative. We also expect a negative coefficient for total assets (smaller firms experience larger announcement effects), a positive coefficient for long term debt (more debt offers better outside monitoring and/or higher return volatility), and a negative coefficient

[19] Concurrent earnings announcements do not explain this elevated pre-announcement trading, which is qualitatively unchanged when we exclude those buyback announcements where an earnings announcement occurs on the same day (approximately 8% of the buyback announcement sample).

for pre-announcement stock return (a transitory reversal and/or managers' effort to release favorable information around the buyback). We include *EPS accretion* as an additional variable to assess its explanatory power beyond the more fundamental performance and compensation variables.

Table 6 summarizes the results of four regressions: (a) all observations, (b) observations with high five percent ownership (to assess the impact of option compensation for this partition), (c) all observations with *EPS accretion* as an additional variable (to test for the incremental effect of accretive EPS), and (d) observations with above median accretive EPS (also to assess the impact of option compensation for this partition). First, the intercepts are significantly positive (regression 1 coefficient = 0.068, significant at $p<.001$), consistent with an overall announcement effect. Second, Log of *total assets* and *capital expenditures to total assets* have negative coefficients. This indicates that smaller companies and those with less capital expenditure experience higher announcement period returns (regression 1 coefficient = -0.006, significant at $p<.001$). More leveraged companies (*Long-term debt to total assets*) also experience higher announcement returns (regression 1 coefficient = 0.016, significant at $p<.1$). Third, *Cumulative excess return* for days -90 to -2 shows a negative coefficient, whereas cumulative return for days 2 to 90 is not significant. The overall announcement effect is also significantly lower in 2006 than 2007, as the *Year 2006* coefficient is negative. Fourth, *Fair value of stock option grant* and *CEO total compensation to total assets* are significantly negative in all three regressions. In other words, investors apparently discount the shares for buyback companies with higher option grant fair value and higher CEO compensation, which presumably includes option grant compensation. Note, also, that *CEO total compensation* is more negative for the high insider ownership regression (regression 2), possibly reflecting investors' recognition of

higher governance and agency costs in these cases. Collectively, these results support our contention that while buybacks apparently create agency costs through higher option-induced compensation, outside investors act is if they are aware of these costs and discount the returns. These results are qualitatively unchanged when we use *EPS accretion* as an additional independent variable (regression 3) or partition the announcement sample on companies with above median *EPS accretion* (regression 4). In short, they offer new results regarding our second research expectation–that investors respond to those same option and compensation factors we have shown to explain buyback activity.

### *3.5 Buybacks and accounting rules*

The agency costs of buybacks may also stem from the unclear disclosure about buyback gains or losses that encourage CEOs to increase option compensation through unwise buybacks that underperform. If such rules induce additional compensation through a buyback, proxies for the effects of unclear accounting should relate positively to option compensation. We use three proxies for the construct of unclear accounting based on the idea that such accounting (e.g., limited disclosure, reissuance gains and losses in equity) increases the potential for an unwise buyback that eventually underperforms, thereby triggering higher agency costs. Conversely, with more disclosure and transparency, we would expect the accounting rules to induce lower agency costs through better buybacks. This positive link between our proxies for accounting opacity and buyback underperformance could reflect other effects as well. However, if unsystematic, a cross-sectional analysis should reduce these effects through diversification.

The first proxy for the effects of unclear accounting, $Perf_1$, equals one if excess stock return following a buyback is in the lowest quartile, zero otherwise; in other words, unclear accounting

relates to an adverse market outcome for the company. The second, $Perf_2$, equals one if excess stock return following a buyback is in the lowest or highest quartile, zero otherwise; in other words, unclear accounting relates to a high variance market outcome for the company. The third, $Perf_3$, equals one if Compustat data item *reajo* < 0, zero otherwise, which we motivate as follows. When a company reissues treasury stock, it charges the difference between the cost and reissue amount to retained earnings, which it includes in "other retained earnings adjustments" (Compustat item, *reajo*). Thus, for *reajo* < 0 (*reajo* > 0), on average, we should expect a greater preponderance of reissuance losses (gains) rather than gains (losses), consistent with buyback underperformance. If a company repurchases shares at a discount, we would expect *reajo* to reflect mostly reissuance gains.

Table 7 presents the results. The dependent variable is log of buyback outlay, as per table 4, and the independent variables are from that same table. The regressions include two additional variables, namely, $Perf_1$ (or $Perf_2$, $Perf_3$) times *Options granted to csho* and $Perf_1$ (or $Perf_2$, $Perf_3$) times Log of *CEO total compensation*.[20] Not surprisingly, the same non-option variables that are significant in table 4 are also significant in table 7 (*Free cash flow to total assets*, Log of *total assets*, *Net income to common equity*, *Long-term debt to total assets*, and *Year 2006* and *Year 2007*). In contrast, the coefficient for *Options granted to csho*, while insignificant in table 4, is positive and significant for the interaction of *Options granted to csho* and $Perf_1$, $Perf_2$, and $Perf_3$ in table 7. In other words, the number of options granted, which is positively associated with buyback outlay, associates more positively with buybacks having adverse performance relative to other buybacks. This result supports

[20] Unfortunately, we have too few degrees of freedom to interact the unit variables with all option and compensation factors in table 4.

our contention that unclear accounting and disclosure rules for buybacks obscures the link between options and buybacks by providing less than complete disclosure about buyback performance, for example, about the gains and losses from such transactions. Table 7 also shows no change in CEO compensation in the presence of adverse performance (for $Perf_1$ and $Perf_2$). Whereas the positive coefficient for Log of *CEO total compensation* in table 7 (0.206 in the first regression, significant at $p<.0001$) is much the same as in table 4 (0.173 in the first regression (significant at $p<.0001$), the interaction of Log of *CEO total compensation* and buyback under-performance is insignificant for $Perf_1$ and $Perf_2$, although it is significantly negative for $Perf_3$. Thus in the case of $Perf_3$, whatever additional compensation managers might garner from options through buybacks, which suggests a positive coefficient, appears to be offset by other compensation factors, for example, those reflecting adverse or extreme performance outcomes. In untabulated analysis, we re-estimate the regressions in table 7 with *EPS accretion* as an additional independent variable and observe no change in the results.

## 4. Other tests

### *4.1 CEO Insider Trading and Stock Buybacks*

As explained in sub-section 3.3 and summarized in table 5, we document that CEO options exercised, among other variables, significantly explain the buyback-induced reduction in common shares. Our data show this as a contemporaneous relation. A testable consequence of this result is that if a CEO later sells the common shares received upon exercise then we should observe an increase in CEO share dispositions following a buyback, which should relate positively to the buyback amount. While previous work has interpreted this empirical result as a response to market over-pricing (Pettit et al. 1996, Louis et al. 2008), an alternative explanation relates to our contention

about the use of buybacks to enhance CEO option compensation, which encourages option exercise, which in turn prompts the sale of shares received upon exercise. Also, consistent with higher CEO dispositions, we should observe a decrease in CEO acquisitions following a buyback.

To examine these relations, we regress buyback outlay, defined as the log of common shares repurchased (log of *prstkc-prstkpc*) on the log of the value of CEO shares traded (number of insider shares acquired or disposed times transaction price per share). We obtain CEO insider trading data from companies' Form 4 insider trading filings, available from Thomson Reuters. To adjust for company size, we deflate both variables by the market value of common equity (*mkvalt_f*). We then test whether this relation (between shares repurchased and CEO insider trading), which we expect to be positive for dispositions and non-positive for acquisitions (because the company acquires shares from CEOs among other shareholders as part of the buyback), is incrementally positive (non-positive) for insider dispositions (acquisitions) following a buyback versus before a buyback. For this purpose, we define an indicator variable Post Buyback CEO Trad. as equal to one for CEO insider trading after a buyback, zero otherwise. We also control for possible year effects.

Table 8 summarizes the results, split between low buyback outlay (panel A) and high buyback outlay (panel B). The coefficient for the interaction of Log of CEO Trad./Mcap times Post Buyback CEO Trad. is significantly positive for dispositions in panels A and B. This coefficient is also insignificantly negative for acquisitions in panel A and significantly negative for acquisitions in panel B. In other words, the link between shares repurchased and CEO insider trading, which we expect and find to be positive for dispositions (e.g., panel B, coefficient = 0.032) and non-positive for acquisitions (e.g., panel B, coefficient = -0.004), increases positively for dispositions following a

buyback (e.g., panel B, coefficient = 0.019) and increases negatively for acquisitions following a buyback (e.g., panel B, coefficient = -0.010).

Collectively, the results of tables 5 and 8 suggest that CEOs exercise stock options contemporaneously with a buyback (table 5), which enables them to increase their insider dispositions following a buyback (table 8). In short, and consistent with an agency cost perspective, we find a positive relation between elevated CEO insider dispositions following a buyback and the number of shares repurchased, consistent with a buyback augmenting the sale of CEO shares issued upon exercise of stock options. This insider trading analysis also shows no evidence of an increase in CEO insider acquisitions following a buyback and, thus, provides no support for the view that CEOs acquire shares following a buyback to exploit share under-pricing.

### *4.2 Other possible variables*

Our findings of a relation between stock buybacks and option compensation could arise for unrelated reasons, for example, because superior past performance affords greater cash or value distribution to managers and shareholders as a buyback or option compensation. Reduced internal growth could also encourage policies of distribution by buyback and option exercise through higher stock prices. To examine these other possibilities, we calculated the mean and median of key financial and compensation characteristics relative to the year of buyback announcement (event year 0). Unreported results show the following (Compustat labels in parentheses, if not defined earlier). First, other than a temporary drop in the buyback year (year 0), *Market-to-book ratio* rises over event years -2 to 1. Capital expenditures (*capex*) rise similarly. Both indicators suggest increased rather than reduced future growth potential. EPS (*epspi*) also decreases over years -2 to 0. This evidence

runs counter to the view that superior past earnings or diminished future growth might help explain the buybacks in our sample. In untabulated analysis, we also assessed the trend of other variables. These trends also support our findings and conclusions. For instance, we observe higher year 0 means for *EPS accretion*, *CEO options exercised*, CEO value realized from options exercise (*ceoopt realized*), CEO grant value (*ceo black scholes grant value*), and CEO total compensation. Overall, this analysis increases our confidence that unrelated factors possibly not controlled for earlier do not drive the results.

### *4.3 Sensitivity tests*

We also ran sensitivity tests of the regressions in tables 3 through 8. Untabulated analysis shows that none of these alternatives changes the general conclusions we draw. First, we re-ran the regressions (with fewer observations) excluding companies with zero dividends, because such companies may not make the choice of a buyback versus a dividend; second, we used lagged values of deflators for certain variables because a non-lagged deflator may include the impact of the buyback for some variables; third, we examined models including buyback *EPS accretion* and excess return in the prior year; fourth, we observed a negative coefficient on prior year excess return in tables 4, 5, and 7 consistent with the view that buyback outlay or share reduction increases as prior return decreases; and fifth, we analyzed a reduced sample of first-time buyback announcements.

## 5. Summary and conclusions

Record levels of buybacks and recent changes in accounting rules suggest that the context for buybacks and stock options may have changed from the earlier periods that form the backdrop for the prior research. Our findings reflect this contemporary context and offer several new results about

what drives this form of company payout. First, our results support our two primary research expectations–that the choice and amount of a buyback relate significantly to CEOs' stock option compensation, and that weak governance and unclear accounting rules regarding buybacks further influence this relation. Once we control for these factors, we find no evidence that buyback choice or amount associates reliably with the accretion in EPS induced by a reduction in common shares, as reported in certain earlier studies. Second, our results also show a significant role for CEO options incremental to stock options in general (including employee stock options), which prior research has examined but not found as incrementally significant.

Third, and also new to the literature, we document that buybacks and stock option compensation show a contemporaneous rather than a sequential relation. Buybacks and stock options under this view reflect a mutual or joint effort to augment management compensation, rather than a lagged relation as reported earlier. Fourth, we find a positive relation between elevated CEO insider selling following a buyback and the number of shares repurchased, consistent with the buyback augmenting the sale of CEO shares issued upon exercise of stock options. Finally, we report that investors experience reliably negative stock returns over the six months around the announcement, other than a positive 1.78 percent three-day announcement return. This result regarding investor return runs counter to the prior research, which mostly shows that buybacks offer positive returns for shareholders. Collectively, these findings add to the literature on why managers spend substantial sums to repurchase stock. By confirming our research expectations regarding a link between buybacks, CEO compensation, and unclear accounting, this study reliably supports the view that the landscape for stock options and buybacks has changed since the earlier work.

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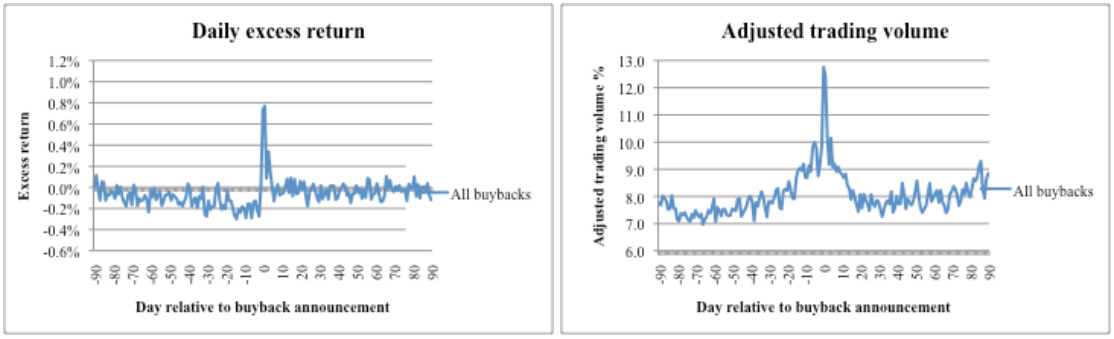
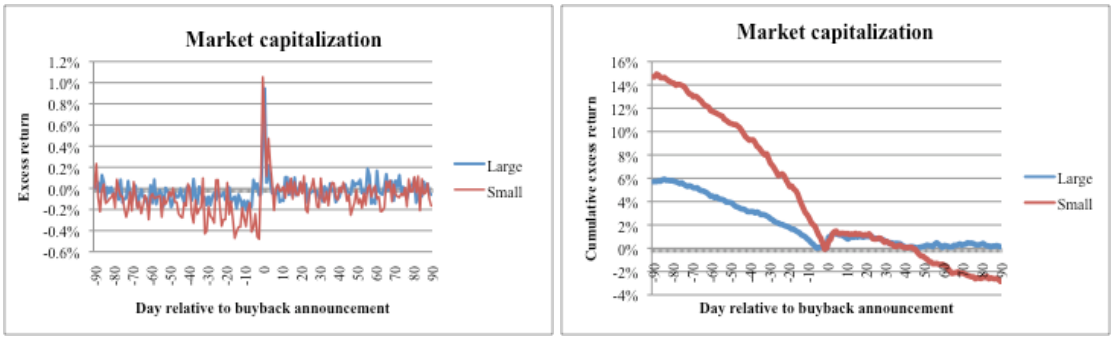
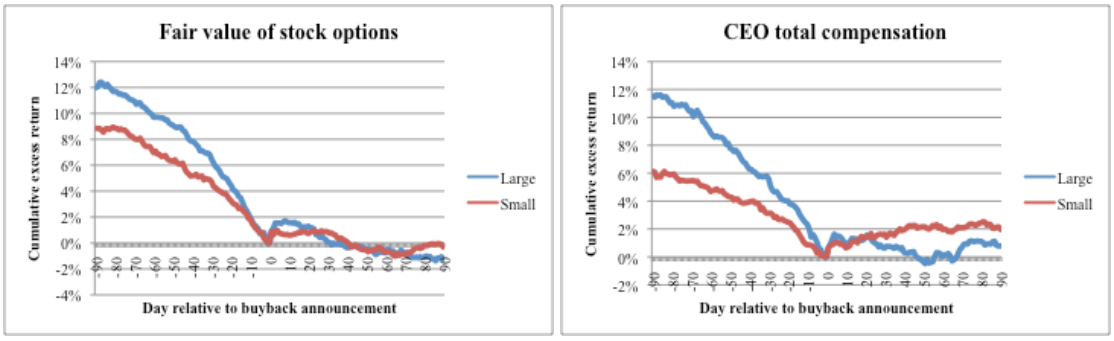
## Figure 1: Investor Response Around Buyback Announcement

### Panel A.




### Panel B.




Panel A plots the mean daily excess return and adjusted trading volume (trading volume ÷ common shares outstanding) cumulated from 90 days before to 90 days after the buyback announcement. Panel B plots the mean daily excess return split into high and low groups on the basis of market capitalization, fair value of stock options, and CEO total compensation cumulated from 90 days before to 90 days after the buyback announcement.

## Table 1: Composition of Samples

| NAICS | NAICS name | Buyback sample | Percent | Div Incr. Sample | Percent | Other Coys. | Percent | All Obs. | 2005-2007 | Percent | 2006 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33 | Metal, Machine, Transportation, Electronics, Computer, and Furniture Manufacturing | 2,748 | 28.8% | 1,533 | 24.5% | 7,402 | 30.1% | 11,683 | 3,838 | 28.3% | 1,323 | 1,156 |
| 51 | Information | 1,532 | 16.1% | 526 | 8.4% | 3,844 | 15.6% | 5,902 | 1,778 | 13.1% | 634 | 516 |
| 32 | Wood, Paper, Petroleum, Plastics, and Chemicals Manufacturing | 936 | 9.8% | 947 | 15.1% | 3,482 | 14.1% | 5,365 | 1,938 | 14.3% | 669 | 621 |
| 53 | Real Estate and Rental and Leasing | 362 | 3.8% | 730 | 11.6% | 1,507 | 6.1% | 2,599 | 1,030 | 7.6% | 350 | 344 |
| 54 | Professional and Technical Services | 661 | 6.9% | 188 | 3.0% | 1,507 | 6.1% | 2,356 | 724 | 5.3% | 244 | 224 |
| 21 | Mining | 334 | 3.5% | 312 | 5.0% | 1,115 | 4.5% | 1,761 | 700 | 5.2% | 238 | 242 |
| 42 | Wholesale Trade | 371 | 3.9% | 288 | 4.6% | 765 | 3.1% | 1,424 | 458 | 3.4% | 159 | 138 |
| 31 | Food. Beverage, Textile, Apparel Manufacturing | 373 | 3.9% | 330 | 5.3% | 698 | 2.8% | 1,401 | 442 | 3.3% | 156 | 133 |
| 44 | Motor Vehicles, Electronics, Computer, Food, Gasoline, Clothing Retail Trade | 439 | 4.6% | 234 | 3.7% | 634 | 2.6% | 1,307 | 388 | 2.9% | 130 | 124 |
| 48 | Transportation and Warehousing | 225 | 2.4% | 254 | 4.1% | 626 | 2.5% | 1,105 | 461 | 3.4% | 182 | 142 |
| 56 | Administrative and Waste Services | 299 | 3.1% | 125 | 2.0% | 569 | 2.3% | 993 | 305 | 2.2% | 103 | 92 |
| 72 | Accommodation and Food Services | 306 | 3.2% | 108 | 1.7% | 472 | 1.9% | 886 | 277 | 2.0% | 97 | 79 |
| 45 | General Merchandise, Sporting Goods, Hobby, Book, and Music Stores | 269 | 2.8% | 136 | 2.2% | 467 | 1.9% | 872 | 272 | 2.0% | 91 | 81 |
| 62 | Health Care and Social Assistance | 247 | 2.6% | 59 | 0.9% | 530 | 2.2% | 836 | 288 | 2.1% | 99 | 92 |
| 23 | Construction | 187 | 2.0% | 91 | 1.5% | 338 | 1.4% | 616 | 212 | 1.6% | 73 | 72 |
| 22 | Utilities | 46 | 0.5% | 252 | 4.0% | 144 | 0.6% | 442 | 160 | 1.2% | 59 | 49 |
| 71 | Arts, Entertainment, and Recreation | 59 | 0.6% | 58 | 0.9% | 190 | 0.8% | 307 | 108 | 0.8% | 39 | 32 |
| 81 | Other Services (except Public Administration) | 54 | 0.6% | 28 | 0.4% | 95 | 0.4% | 177 | 58 | 0.4% | 20 | 17 |
| 61 | Educational Services | 51 | 0.5% | 6 | 0.1% | 106 | 0.4% | 163 | 55 | 0.4% | 18 | 17 |
| 11 | Agriculture, Forestry, Fishing and Hunting | 19 | 0.2% | 33 | 0.5% | 82 | 0.3% | 134 | 37 | 0.3% | 13 | 9 |
| 49 | Postal, courier service, warehousing, and storage | 18 | 0.2% | 30 | 0.5% | 59 | 0.2% | 107 | 36 | 0.3% | 12 | 11 |
| | All | 9,536 | | 6,268 | | 24,632 | | 40,436 | 13,565 | | 4,709 | 4,191 |

This table shows the composition of the company-year observations by two-digit NAICS code. The Buyback, Dividend Increase, and "Other Companies" samples comprise all companies in each of the three categories in the merged CRSP/Compustat file for fiscal years 2000 to 2007 (all observations). The sample distributions for 2005-2007 are shown in the remaining columns. Regulated depository institutions (about 26 percent of the Compustat population) are excluded because their capital requirements (and high leverage) restrict their ability to repurchase shares.

## Table 2: Descriptive Characteristics: Buyback Versus Dividend Increase

| Variable and calculation | | Buyback Sample | Dividend Increase Sample | Change vs. Dividend t-test signif. | Change vs. DPS t-test signif. |
|---|---|---|---|---|---|
| Market value of common shares outstanding (in millions) | N | 2,939 | 4,163 | | |
| *mkvalt_f* | Median | 566.56 | 1147.53 | | |
| | Mean | 3514.2 | 7701.32 | *** | *** |
| Total assets (in millions) | N | 3,078 | 4,907 | | |
| *at* | Median | 966.9 | 2089.95 | | |
| | Mean | 10593.05 | 27811.69 | *** | * |
| Market value of common shares out. to total assets | N | 2,897 | 4,094 | | |
| *mkvalt_f÷at* | Median | 1.9 | 2 | | |
| | Mean | 2.942 | 2.846 | ns | *** |
| Net income (loss) to common equity (book value) | N | 2,104 | 4,479 | | |
| *ni÷ceq* | Median | 0.106 | 0.126 | | |
| | Mean | 0.103 | 0.135 | *** | *** |
| Total long term debt to total assets | N | 3,067 | 4,900 | | |
| *dltt÷at* | Median | 0.076 | 0.132 | | |
| | Mean | 0.146 | 0.18 | *** | ns |
| Operating cash flow - capital exp. to total assets | N | 1,550 | 2,617 | | |
| (*oibdp - txc - dvc - dvp-capx*)÷*at* | Median | 0.053 | 0.042 | | |
| | Mean | 0.033 | 0.031 | ns | *** |
| Percentage of insiders owning common stock | N | 1,364 | 2,096 | | |
| *Direct* | Median | 0.071 | 0.051 | | |
| | Mean | 0.134 | 0.122 | * | ns |
| Percentage of five percent owners | N | 1,364 | 2,096 | | |
| *Direct* | Median | 0.201 | 0.149 | | |
| | Mean | 0.219 | 0.178 | *** | ** |
| Number of outside directors | N | 2845 | 4422 | | |
| *Direct* | Median | 6 | 7 | | |
| | Mean | 6.471 | 7.426 | *** | ns |
| CEO total compensation to total assets | N | 1,424 | 2,251 | | |
| *ceototalcomp÷at* | Median | 0.0013 | 0.0009 | | |
| | Mean | 0.0038 | 0.0023 | *** | * |
| Options exercisable to common shares outstanding | N | 2,026 | 3,957 | | |
| *optex÷csho* | Median | 0.053 | 0.033 | | |
| | Mean | 0.067 | 0.042 | *** | *** |
| CEO options exercisable to common shares outstanding | N | 930 | 2,023 | | |
| *ceooptex÷csho* | Median | 0.0008 | 0.0004 | | |
| | Mean | 0.0013 | 0.0007 | *** | *** |
| Options exercised to comm. shares outstanding | N | 2,075 | 4,058 | | |
| *optexd÷csho* | Median | 0.011 | 0.007 | | |
| | Mean | 0.016 | 0.011 | *** | *** |
| CEO options exercised to comm. shares outstanding | N | 928 | 2,019 | | |
| *ceooptexd÷csho* | Median | 0 | 0 | | |
| | Mean | 0.0002 | 0.0001 | *** | ns |
| Options granted to common shares outstanding | N | 2,071 | 4,055 | | |
| *optgr÷csho* | Median | 0.011 | 0.005 | | |
| | Mean | 0.017 | 0.008 | *** | *** |
| CEO options granted to common shares outstanding | N | 926 | 2,012 | | |
| *ceooptgr÷csho* | Median | 0.0009 | 0.0004 | | |
| | Mean | 0.0019 | 0.001 | *** | *** |
| Option grant price to comm. shares outstanding | N | 1,731 | 3,073 | | |
| *optprcgr÷csho* | Median | 0.457 | 0.507 | | |
| | Mean | 0.874 | 1.062 | *** | *** |

This table summarizes the means and medians of certain characteristics of the buyback and dividend increase samples for fiscal years 2005 through 2007. The data are extracted from the merged CRSP/Compustat for fiscal years 2005 through 2007 and the CEO and Directors' Corporate Library data file for those same years. Subsection 2.1 lists the definitions of these variables and their data sources. Tests of significance are for a difference in group means under the assumption of unequal variances across the groups: *** = less than .001, ** = less than .01, * = less than .10, ns = not significant.

## Table 3: Regression Explanation of Buyback Versus Dividend Increase

| | Exp. Sign | OLS Coefficient | Signif. | Nominal Logistic Coefficient | Signif. |
|---|---|---|---|---|---|
| Intercept | | 1.188 | *** | 3.194 | *** |
| Net income to common equity | – | -0.323 | ** | -1.385 | * |
| Long-term debt to total assets | – | -0.104 | ns | -0.534 | ns |
| Market-to-book ratio | +/– | 0.002 | ns | 0.011 | ns |
| Operating free cash flow - capital exp. to total assets | + | 0.651 | ** | 3.475 | ** |
| Log of total assets | – | -0.032 | ** | -0.084 | ns |
| Percentage common shares held by institutions | – | -0.113 | *** | -0.627 | *** |
| Percentage of five percent owners | + | 0.306 | *** | 1.541 | *** |
| Number of outside directors | – | -0.037 | *** | -0.197 | *** |
| CEO age | – | -0.005 | ** | -0.025 | ** |
| Common shares outstanding (csho) x 10^4 | +/– | 0.332 | * | 0.929 | ns |
| Compensation and options variables | | | | | |
| CEO total compensation to total assets | + | 6.668 | *** | 38.356 | *** |
| Options granted to csho | + | 4.266 | *** | 26.456 | *** |
| CEO options granted to csho | + | 10.583 | * | 73.575 | * |
| Options exercisable to csho | + | 1.007 | ** | 4.731 | * |
| CEO options exercisable to csho | + | -7.046 | ns | -24.224 | ns |
| Option grant price to csho | – | -0.001 | ** | -0.017 | *** |
| Adjusted $R^2$ or psuedo $R^2$ | | 0.225 | | 0.200 | |
| No. of observations | | 1,179 | | 1,179 | |
| F ratio/Chi-square | | 22.32 | *** | 325.50 | *** |

The regression sample comprises all companies in the CRSP/Compustat merged data base for 2005 through 2007 and in the CEO and Directors' Corporate Library data for those same years, with no missing data for the independent variables. The dependent variable in the OLS and nominal logistic regressions is one for a buyback (share repurchase during fiscal year) and zero for a dividend increase. A company-year with a buyback and a dividend increase is considered a dividend increase company. Subsection 2.1 lists the definitions of the independent variables and their data sources. Tests of significance are whether the coefficient is zero versus the predicted sign under a one-tailed test of significance: *** = less than .001, ** = less than .01, * = less than .10, ns = not significant.

## Table 4: Regression Explanation of the Buyback Outlay

| Regression | | 1. All buybacks | | 2. All buybacks, year indicators | | 3. *EPS accretion* above median | |
|---|---|---|---|---|---|---|---|
| Independent variable | Exp. sign | Coeff. | Signif. | Coeff. | Signif. | Coeff. | Signif. |
| Intercept | | -4.612 | * | -4.676 | * | -3.935 | ns |
| Net income to common equity | + | 3.207 | *** | 3.202 | *** | 1.940 | * |
| Long-term debt to total assets | – | -1.162 | * | -1.181 | * | -1.655 | * |
| Market-to-book ratio | +/– | 0.033 | ns | 0.033 | ns | 0.154 | *** |
| Oper. free cash flow - cap exp. to tot. assets | + | 5.726 | *** | 5.722 | *** | 2.628 | ns |
| Log of total assets | + | 0.732 | *** | 0.722 | *** | 0.956 | *** |
| Percentage common held by institutions | – | -0.219 | ns | 0.079 | ns | -0.117 | ns |
| CEO age | – | -0.022 | * | -0.023 | * | -0.032 | * |
| Common shares outstanding (csho) x 10^4 | + | 2.009 | * | 2.188 | * | -1.440 | ns |
| Compensation and options variables | | | | | | | |
| Log of CEO total compensation | + | 0.173 | ** | 0.175 | ** | 0.080 | ns |
| Options granted to csho | + | -0.004 | ns | -0.003 | ns | -0.013 | ns |
| CEO options granted to csho x 10^7 | + | 3.478 | * | 3.298 | * | -0.401 | ns |
| Options exercisable to csho | + | 0.002 | ns | 0.001 | ns | 0.006 | * |
| CEO options exercisable to csho x 10^7 | + | 0.675 | ** | 0.664 | ** | 0.649 | * |
| Option grant price to csho | + | 0.009 | * | 0.008 | * | 0.004 | ns |
| Other controls | | | | | | | |
| Inverse Mills ratio | | 0.736 | ns | 0.670 | ns | 0.838 | ns |
| Year 2006 | + | | | 0.347 | * | | |
| Year 2007 | + | | | 0.392 | * | | |
| Adjusted $R^2$ | | 49.97% | | 50.08% | | 48.05% | |
| No. of observations | | 991 | | 991 | | 484 | |
| F ratio | | 66.908 | *** | 59.427 | *** | 30.7783 | *** |

The "All buybacks" samples comprise all company-years in the CRSP/Compustat merged data base for 2005 through 2007 and in the CEO and Directors' Corporate Library data for those same years, with no missing data for buyback outlay and the independent variables. The samples also include those company-years with a buyback and a dividend increase, which were considered as dividend increase companies in table 3. The dependent variable (buyback outlay) in the regressions is the log of common shares repurchased (log of *prstkc-prstkpc*) (in millions). Year 2006 and Year 2007 are indicator variables, equal to one if the event occurs in 2006 or 2007, respectively, zero otherwise. Subsection 2.1 lists the definitions of the other variables and their data sources, other than *EPS accretion*. The calculation of *EPS accretion* is "as reported" EPS less "as if" EPS, where "as if" EPS = (net income$_t$ + $C_t$) ÷ (common shares outstanding$_{t-1}$ + 50% x common shares issued$_t$), where $C_t$ = the average three-month Treasury bill rate during the year x 50% x dollar repurchases$_t$ (assumed to occur at mid-year). An EPS accretive buyback is when *EPS accretion* as calculated is not missing and positive. Tests of significance are whether the coefficient is zero versus the predicted sign under a one-tailed test of significance: *** = less than .001, ** = less than .01, * = less than .10, ns = not significant.

## Table 5: Regression Explanation of Reduction in Common Shares Outstanding

| Regression | | 1.All obs., incl. exercised options | | 2.All obs., incl. industry indicators | | 3.All obs., incl. exercisable options | |
|---|---|---|---|---|---|---|---|
| Independent variable | Exp. sign | Coeff. | Signif. | Coeff. | Signif. | Coeff. | Signif. |
| Intercept | | -4.094 | *** | -4.089 | *** | -4.447 | *** |
| Net income to common equity | + | 1.362 | *** | 1.539 | *** | 1.639 | *** |
| Long-term debt to total assets | + | 0.385 | * | 0.320 | ns | 0.337 | ns |
| Market-to-book ratio | – | -0.063 | ** | -0.067 | ** | -0.065 | ** |
| Oper. free cash flow - cap exp. to tot. assets | + | 0.444 | ns | 0.218 | ns | 0.419 | ns |
| Log of total assets | + | -0.018 | ns | -0.021 | ns | 0.003 | ns |
| Options exercised to csho | + | 14.333 | *** | 13.876 | *** | 11.380 | *** |
| CEO options exercised to csho | + | 196.693 | * | 218.191 | * | 189.701 | * |
| Options unexercised to csho | + | 1.938 | ns | 1.415 | ns | 0.619 | ns |
| Inverse Mills ratio | | 0.317 | ns | 0.202 | ns | -0.044 | ns |
| Year 2006 | + | 0.131 | * | 0.128 | * | 0.159 | * |
| Year 2007 | + | 0.333 | ** | 0.321 | ** | 0.347 | ** |
| Utility industry | – | | | -0.697 | * | -0.656 | * |
| Information industry | + | | | 0.376 | *** | 0.331 | ** |
| Options exercisable to csho | + | | | | | 2.026 | * |
| CEO options exercisable to csho | + | | | | | 54.735 | * |
| Adjusted $R^2$ | | 5.34% | | 6.39% | | 7.42% | |
| No. of observations | | 1,007 | | 1,007 | | 1,006 | |
| F ratio | | 6.671 | *** | 6.719 | *** | 6.755 | *** |

The regression sample comprises all company-years in the CRSP/Compustat merged data base for 2005 through 2007 and in the CEO and Directors' Corporate Library data for those same years, with no missing data for reduction in common shares outstanding and all independent variables. The dependent variable in the regressions is minus one times the log of the negative of the change in common shares outstanding from year t to t+1 divided by common shares outstanding. The dependent variable is defined this way so that a reduction in common shares outstanding converts to a positive number. Subsection 2.1 lists the definitions of the other independent variables and their data sources. Year 2006 and Year 2007 are indicator variables, equal to one if the event occurs in 2006 or 2007, respectively, zero otherwise. Tests of significance are whether the coefficient is zero versus the predicted sign under a one-tailed test of significance: *** = less than .001, ** = less than .01, * = less than .10, ns = not significant.

## Table 6: Regression Explanation of Excess Returns Around Buyback Announcement

| Regression | Exp. sign | 1. All obs. | | 2. High no. of >5% owners. | | 3. All obs., incl. *EPS accretion* | | 4. *EPS accretion* > median | |
|---|---|---|---|---|---|---|---|---|---|
| Independent Variable | | Coeff. | Sig. | Coeff. | Sig. | Coeff. | Sig. | Coeff. | Sig. |
| Intercept | + | 0.0684 | *** | 0.105 | *** | 0.068 | *** | 0.069 | *** |
| Earnings per share | + | 0.0012 | ns | 0.002 | * | 0.001 | ns | 0.002 | * |
| Long-term debt to total assets | + | 0.0163 | * | 0.007 | ns | 0.016 | * | 0.013 | ns |
| Oper. free cash flow-cap exp. to tot. assets | + | -0.0139 | ns | -0.028 | ns | -0.013 | ns | 0.030 | * |
| Log of total assets | – | -0.0061 | *** | -0.007 | *** | -0.006 | *** | -0.006 | *** |
| Capital expenditures to total assets | – | -0.1057 | ** | -0.058 | * | -0.105 | ** | -0.092 | * |
| CEO total compensation to total assets | – | -1.1180 | ** | -2.608 | *** | -1.116 | ** | -0.918 | * |
| Fair value of option grant to csho | – | -0.0107 | *** | -0.010 | * | -0.011 | *** | -0.011 | ** |
| Cumulative excess return (-90 to -2) | – | -0.0218 | ** | -0.029 | ** | -0.022 | ** | -0.005 | ns |
| Cumulative excess return (2 to 90) | + | 0.0043 | ns | 0.006 | ns | 0.004 | ns | 0.004 | ns |
| Year 2006 | – | -0.0097 | ** | -0.010 | * | -0.010 | ** | -0.010 | ** |
| Inverse Mills ratio | | 0.0018 | ns | -0.026 | * | 0.002 | ns | -0.004 | ns |
| EPS accretion | – | | | | | 0.000 | ns | | |
| Adjusted $R^2$ | | 0.058 | | 0.108 | | 0.057 | | 0.034 | |
| No. of observations | | 899 | | 378 | | 899 | | 626 | |
| F ratio | | 6.051 | *** | 4.797 | *** | 5.542 | *** | 3.007 | *** |

The regression sample for the regressions comprises all company-years in the CRSP/Compustat merged data base for 2006 and 2007 and in the CEO and Directors' Corporate Library data for those same years, with no missing data for excess returns and all independent variables. The dependent variable is the sum of excess stock return (in excess of the market return) from day -1 to day 1 around the announcement date (day 0) of a buyback for buybacks in 2006 and 2007. Year 2006 is an indicator variable, equal to one if the event occurs in 2006, zero otherwise. Subsection 2.1 lists the definitions of the other independent variables and their data sources. Tests of significance are whether the coefficient is zero versus the predicted sign under a one-tailed test of significance: *** = less than .001, ** = less than .01, * = less than .10, ns = not significant.

## Table 7: Explanation of Buyback Outlay Including Proxies for the Effects of Unclear Accounting

| Regression | | 1. Negative Market Performance, $Perf_1$ | | 2. Extreme Market Performance, $Perf_2$ | | 3. Negative Retained Earnings Adjustments, $Perf_3$ | |
|---|---|---|---|---|---|---|---|
| Independent variable | Exp. Sign | Coeff. | Signif. | Coeff. | Signif. | Coeff. | Signif. |
| Intercept | | -5.348 | *** | -5.629 | *** | -7.484 | *** |
| Market-to-book ratio | +/– | 0.131 | *** | 0.129 | *** | 0.060 | * |
| Common shares outstanding (csho) | + | 0.000 | * | 0.000 | * | 0.000 | * |
| Net income to common equity | + | 1.151 | * | 1.153 | * | 3.094 | *** |
| Long-term debt to total assets | – | -1.032 | * | -1.080 | ** | -1.225 | ** |
| Free cash flow | + | 4.212 | *** | 4.160 | *** | 5.858 | *** |
| Log of total assets | + | 0.731 | *** | 0.720 | *** | 0.824 | *** |
| Percentage common held by institutions | – | 0.201 | ns | 0.188 | ns | 0.089 | ns |
| Year 2006 | + | 0.753 | ** | 0.715 | ** | 0.349 | * |
| Year 2007 | + | 0.862 | *** | 0.848 | *** | 0.401 | * |
| Inverse Mills ratio | +/– | 0.896 | ns | 0.900 | ns | 1.055 | ns |
| Options granted to csho | + | 0.009 | * | 0.007 | ns | 0.004 | ns |
| Log of CEO total compensation | + | 0.206 | *** | 0.186 | * | 0.229 | *** |
| Options granted to csho x $Perf_1$ | + | 0.105 | ** | | | | |
| Log of CEO total compensation x $Perf_1$ | +/– | -0.085 | ns | | | | |
| $Perf_1$ | + | 0.521 | ns | | | | |
| Options granted to csho x $Perf_2$ | + | | | 0.029 | * | | |
| Log of CEO total compensation x $Perf_2$ | +/– | | | 0.018 | ns | | |
| $Perf_2$ | + | | | -0.225 | ns | | |
| Options granted to csho x $Perf_3$ | + | | | | | 0.031 | * |
| Log of CEO total compensation x $Perf_3$ | +/– | | | | | -0.252 | * |
| $Perf_3$ | + | | | | | 4.044 | * |
| Adjusted $R^2$ | | 47.0% | | 47.0% | | 49.7% | |
| No. of observations | | 810 | | 810 | | 1,001 | |
| F ratio | | 52.144 | *** | 55.922 | *** | 66.932 | *** |

The regression sample comprises all company-years in the CRSP/Compustat merged data base for 2005 through 2007 and in the CEO and Directors' Corporate Library data for those same years, with no missing data for buyback outlay and all independent variables. The sample also includes those company-years with a buyback and a dividend increase, which were considered as dividend increase companies in table 3. The dependent variable (buyback outlay) in the OLS regressions is the log of common shares repurchased (in millions). Year 2006 and Year 2007 are indicator variables, equal to one if the event occurs in 2006 or 2007, respectively, zero otherwise. Subsection 2.1 lists the definitions of the other independent variables and their data sources. Negative performance ($Perf_1$) equals one if cumulative excess return from days 3 to 90 is below the 25% percentile, zero otherwise. Extreme performance ($Perf_2$) equals one if cumulative excess return from days 3 to 90 is below the 25 percentile or above the 75 percentile, zero otherwise. Negative other retained earnings adjustments ($Perf_3$) equals one if Compustat item *reajo* < 0, otherwise 0. Subsection 2.1 lists the definitions of the independent variables and their data sources. Tests of significance are whether the coefficient is zero versus the predicted sign under a one-tailed test of significance: *** = less than .001, ** = less than .01, * = less than .10, ns = not significant.

## Table 8: Relation Between Buyback Outlay and CEO Insider Trading

| Regression | 1. Acquisition | | | 2. Disposition | | |
|---|---|---|---|---|---|---|
| Independent variable | Exp. Sign | Coeff. | Signif. | Exp. Sign | Coeff. | Signif. |
| Panel A: Low Buyback Outlay | | | | | | |
| Intercept | | 2.883 | *** | | 2.881 | *** |
| Log of CEO Trad./*mkvalt_f* | – | -0.031 | *** | + | -0.107 | *** |
| Post Buyback CEO Trad. | –/+ | -0.069 | * | –/+ | 0.101 | *** |
| Log of CEO Trad./Mcap x Post Buyback CEO Trad. | – | -0.005 | ns | + | 0.026 | *** |
| Year 2007 | | 0.153 | *** | | 0.122 | *** |
| Adjusted $R^2$ | | 1.5% | | | 1.3% | |
| F ratio | | 23.227 | *** | | 265.218 | *** |
| No. insider trading observations | | 5,835 | | | 24,105 | |
| Panel B: High Buyback Outlay | | | | | | |
| Intercept | | 4.477 | *** | | 4.246 | *** |
| Log of CEO Trad./*mkvalt_f* | – | -0.004 | ns | + | 0.032 | *** |
| Post Buyback CEO Trad. | –/+ | 0.048 | * | –/+ | 0.126 | *** |
| Log of CEO Trad./Mcap x Post Buyback CEO Trad. | – | -0.010 | * | + | 0.019 | *** |
| Year 2007 | | 0.117 | *** | | 0.167 | *** |
| Adjusted $R^2$ | | 4.2% | | | 7.6% | |
| F ratio | | 17.612 | *** | | 512.421 | *** |
| No. insider trading observations | | 5,111 | | | 25,004 | |

The dependent variable (buyback outlay) is the log of common shares repurchased (*prstkc-prstkpc)* divided by market capitalization (in millions) (*mkvalt_f*). Insider trades are those for CEOs only based on Form 4 insider filings, available from Thomson Reuters. Log of CEO Trad./*mkvalt_f* is the log of the dollar value of an insider trade x 1,000 divided by market capitalization (in millions) (*mkvalt_f*). Post Buyback CEO Trad. equals one if an insider trade follows a buyback, zero otherwise. Year 2007 is an indicator variable, equal to one if the buyback outlay observation occurs in 2007, zero otherwise. Number of observations refers to the number of insider trades by the CEO from January 1, 2005 to December 31, 2008. Buyback Outlay observations comprise all company-years in the CRSP/Compustat merged data base for 2006 and 2007 with no missing data for buyback outlay. The sample also includes those company-years with a buyback and a dividend increase, which were considered as dividend increase companies in table 3. Tests of significance are whether the coefficient is zero versus the predicted sign under a one-tailed test of significance: *** = less than .001, ** = less than .01, * = less than .10, ns = not significant.