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# Why do Firms Repurchase Stock?

Jordan Voss

**ABSTRACT.** The tremendous increase in share repurchases warrants an explanation. Why have firms increasingly turned to repurchases as a payout method? Undervaluation is commonly touted as the underlying reason behind repurchase decisions. This paper identifies several possible rationales behind repurchase decisions, in addition to undervaluation, by examining the relative advantages of share repurchases over dividends and the managerial incentives associated with share repurchases. The findings indicate managerial incentives are a key factor behind the decision to repurchase stock.

## I. Introduction

In his 1984 letter to shareholders, Warren Buffet said "When companies with outstanding businesses and comfortable financial positions find their shares selling far below intrinsic value in the marketplace, no alternative action can benefit shareholders as surely as repurchases." For decades, U.S. corporations have overwhelmingly preferred to distribute excess cash in the form of dividends rather than share repurchases, despite the preferential tax treatment of capital gains over ordinary income (Grullon and Michaely 2002). Since the early 1980s, however, share repurchase activity has grown significantly. In 2004 (net) repurchases for U.S. industrials were \$155 billion while dividends were about \$137 billion (Skinner 2008). This means that in 2004, for the first time in history, share repurchase programs were more popular than dividends.

Why has there been such a dramatic change in corporate payout policy over the last 30 years? That is, why are companies increasingly turning to stock repurchases as a distribution method for excess cash? Logically, the only reason for a firm to repurchase stock is because it is undervalued. Empirical evidence, however, finds that undervaluation alone is not enough to explain a firm's repurchase decision. This paper identifies several likely reasons corporations repurchase stock by examining the undervaluation hypothesis, the relation between stock repurchases and dividends, and managerial incentives. It concludes that managerial incentives have a significant impact on corporate payout policy.

## **II. Background Information**

### **A. HISTORY AND REGULATION**

Nearly all of the research on share repurchases has been conducted subsequent to the early 1980s. Prior to this period, share repurchase programs were virtually non-existent. This is because the Securities and Exchange Act of 1934, Section 9, prohibited the manipulation of securities prices (U.S. Securities and Exchange Commission 1934). In addition, Section 10b-5 of the Securities Exchange Act prohibited "any act or omission resulting in fraud or deceit in connection with the purchase or sale of any security" (U.S. Securities and Exchange Commission 1934). Corporations were reluctant to repurchase stock on the open market due to the potential risk of violating the prohibited manipulation provisions of the Securities and Exchange Act of 1934. Share repurchase programs have never been illegal in the United States, but there is reason to believe that regulators have been concerned with the impact these programs might have on stock prices. The in 1967 a Senate Committee wrote:

Corporate repurchases of their own securities may serve a number of legitimate purposes. For example, they may result from a desire to reduce outstanding capital stock following the cash sale of operating divisions or subsidiaries, or to have shares available for options, acquisitions, employee or stock purchase plans, and the like, without increasing the total number of shares outstanding. Repurchase programs, however, may also be utilized by management to preserve or strengthen their control by counteracting tender offers or other attempted takeovers, or may be made in order to increase the market price of the company's shares. Whatever the motive behind the repurchase program, if the repurchases are substantial they will have a significant impact on the market. (Senate Report No. 550, 90th Congress; 1967).

According to Grullon and Michaely (2002), the SEC has, for decades, occasionally charged companies with illegally manipulating their stock prices during share repurchase programs. Until 1982 there were no specific rules that directly regulated share repurchase activity in the United States. Grullon et al. (2002) argue that "This situation exposed

repurchasing firms to the risk of triggering a SEC investigation and being charged with illegal market manipulation. Since the direct and indirect costs of a regulatory inquiry can be very large, it seems that firms were indeed deterred from repurchasing shares."

Between 1967 and 1980 the SEC proposed several rules in an effort to direct corporations on how to implement share repurchase programs without raising suspicions of manipulative behavior (Grullon et al. 2002). Finally, after nearly fifteen years of proposals, the SEC approved Rule 10b-18, which "provides a voluntary 'safe harbor' from liability for manipulation under Sections 9a-2 and 10b of the Securities Exchange Act of 1934, and Rule 10b-5 under the Securities Exchange Act, when an issuer or its affiliated purchaser bids for or purchases shares of the issuer's common stock" (U.S. Securities and Exchange Commission 1934). If firms were reluctant to repurchase shares because of the potential risk of being charged with illegal market manipulation by the SEC, then share repurchase activity should have increased significantly after the adoption of Rule 10b-18 in 1982 (Grullon et al. 2002).

## B. REPURCHASE METHODS

One of the main regulatory concerns about repurchases is the potential for shareholders to be treated unequally, as some investors will sell their shares back to the firm and others will not. In order to deal with this problem, the SEC requires that companies publicly announce, prior to any repurchase, that they have received authorizations from the Board of Directors to buy back their own shares. There are essentially five ways that a corporation can repurchase its own shares: (1) Fixed price tender offer, (2) Dutch auction tender offer, (3) Repurchase in the open market, (4) Negotiated repurchase from private investors, and (5) Repurchase involving derivatives (Vermaelen 2005). The most common way to repurchase stock is through an open market share repurchase program; therefore, the focus of the paper will only be on shares repurchased in the open market.

In contrast to tender offers (where the company is obligated by the SEC to repurchase its, publicly announced, targeted number of shares), open market share repurchase programs are not firm commitments (Vermaelen 2005). Similar to a traditional option contract, in an open market share repurchase program the company has an option to repurchase stock, but not an obligation. Consequently, it is common to

see repurchase programs completed several years after the announcement of the repurchase authorization (Vermaelen 2005). While open market repurchase programs are not firm commitments, Stephens and Weisbach (1998) show that the average completion rate in the U.S. is between 74 and 82 percent. Using a more precise method to measure repurchase activity, Kahle, Dyl and Banyl (2005) show a completion rate of 90% in their sample of Fortune 500 firms. Although open market repurchase authorizations are not always followed by actual repurchases, that does not mean that managers are trying to manipulate their stock price or are doing something unethical. In a study of Canadian companies, Ikenberry, Lakonishok and Vermaelen (2000) show that firms tend to repurchase fewer shares if the stock price rises significantly in the year following the repurchase. This evidence is consistent with the belief that managers try to take advantage of undervalued stock prices, but refrain from repurchasing stock if the market becomes efficient, or inefficient but in the opposite direction. Alternatively, it could mean that the firm discovered new growth opportunities, which made stock repurchases relatively unattractive (Vermaelen, 2005). In either case, failure by a company to complete its open market repurchase authorization should not necessarily be viewed negatively. Rather, it can be seen as a positive that management wants to repurchase shares only when the shares are at undervalued prices or when the company has no alternative uses for its excess cash.

### **III. The Undervaluation Hypothesis and Signaling**

Many different theories have been suggested as to why companies purchase their shares in the open market. Perhaps the most straightforward way to address this question is to poll executives of corporations and document their answers. In 2005, Brav, Graham, Harvey, and Michaely surveyed 384 financial executives and conducted in-depth interviews with an additional 23 to determine the factors that drive dividend and share repurchase decisions. The summary results from their survey will be discussed throughout the paper.

The most fundamental explanation as to why companies repurchase their stock is that the company believes their shares are undervalued, and can therefore create shareholder value by purchasing their own shares at a discount to intrinsic value. On the surface this first theory is the only logical explanation for a company to repurchase its stock. After all, the

goal of financial management is to maximize shareholder value, and if shares are repurchased at anything other than an undervalued price, shareholder value would be destroyed. Many other theories, however, have been offered by academics that attempt to explain a company's decision to repurchase its stock, regardless of whether or not the shares are undervalued.

The undervaluation hypothesis is similar to the signaling hypothesis. When management repurchases stock solely on the basis of undervaluation, management is, in effect, sending a signal to the market that their future prospects (projected cash flows) are not accurately reflected in the price of the stock. Therefore, the undervaluation hypothesis assumes that markets are strong-form inefficient because company insiders are able to take advantage of the informational asymmetry between themselves and investors. In the survey of Chief Financial Officers (CFOs) the most important motivation behind repurchasing stock is to "take advantage of an undervalued stock price" (Brav, et al. 2005). In the same survey, however, few CFOs indicated that payout policy decisions were made for the purpose of conveying information to shareholders or the market (Brav, et al. 2005). This likely implies that the Undervaluation Hypothesis is an important factor in determining payout policy while the signal resulting from the payout policy decision is an important factor in determining why stock prices tend to increase after certain payout methods.

Warren Buffett, Chairman and CEO of Berkshire Hathaway and arguably the greatest investor of all time, said the following about stock repurchases in his 1984 and 2011 letters to shareholders:

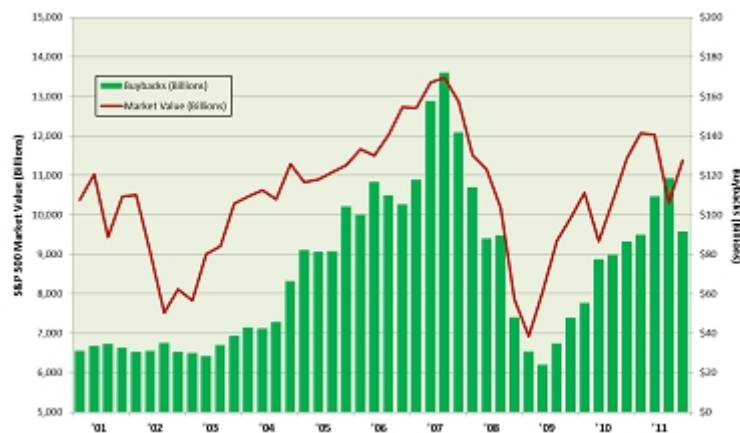
... We like making money for continuing shareholders, and there is no surer way to do that than by buying an asset - our own stock - that we know to be worth at least  $x$  for less than that - for  $.9x$ ,  $.8x$  or even lower. (As one of our directors says, it's like shooting fish in a barrel, after the barrel has been drained and the fish have quit flopping) (2011).

When companies purchase their own stock, they often find it easy to get \$2 of present value for \$1. Corporate acquisition programs almost never do as well and, in a discouragingly large number of cases, fail to get anything close to \$1 of value for each \$1 expended (1984).

It seems many Chief Financial Officers surveyed agree with Buffett's logic. Most CFOs said that they accelerate (or initiate) share repurchases when their company's stock is low by recent historical standards (Brav, et al. 2005). The most popular response for all repurchase questions on the entire survey is that firms repurchase when their stock is a good value, relative to its true value: 86% of all firms agree or strongly agree with this belief (Brav, et al. 2005).

Other than simply relying on survey evidence, it might be useful to look at empirical data to determine whether the Undervaluation Hypothesis is true. If the Undervaluation Hypothesis is correct, companies that repurchase their stock would likely do so when their stock is trading at a low price. Indeed, empirical evidence seems to indicate that firms repurchase stock when they are potentially undervalued, as evidenced by the firm's market-to-book ratio (Dittmar, 2000). Similarly, Stephens and Weisbach (1998) show that firms repurchase stock after a period of negative stock performance. Lakonishok, Shleifer, and Vishny (1994) also show that firms with low market-to-book ratios earn abnormal returns in subsequent periods. In addition, Fenn and Liang (2001) find that repurchases are positively related to net operating cash flow and negatively related to market-to-book ratios.

In concluding that the Undervaluation Hypothesis is correct, the academic research is also implicitly concluding that there is an information asymmetry between a firm's executives and its investors. That is, the firm knows more about the true value of its stock than outside investors and can therefore capitalize on this informational advantage by repurchasing its stock at a price below its true value.



While this seems logical, consider the following chart from *The Wall Street Journal* which might show a slightly different story. A closer examination shows that stock repurchases by U.S. companies hit their highest level in the third quarter of 2007, precisely the time that the Great Recession in the U.S. began. The Standard and Poor's 500 Index fell from 1526.75 in September 2007 to 735.09 in February 2009, representing a decline of 51.9%. Perhaps company insiders do not always possess an informational advantage over outside investors.

#### **IV. The Difference Between Repurchasing Stock and Paying Dividends**

To explain the reasoning behind repurchasing stock instead of paying cash dividends to shareholders, a few assumptions need to be made. First, a company is not repurchasing its shares because they are undervalued. The shares could be undervalued, but this is not the motivation for the repurchase. Second, we assume that the company has excess cash and not enough uses for its cash. It is often argued that companies that repurchase stock have no other profitable investment opportunities or uses for its cash. This argument, however, is not as prevalent in the case of a dividend increase or initiation. In this section it must be assumed that in either the case of a dividend increase or in the case of a repurchase authorization, the company has excess cash on hand and not enough investment opportunities or uses for its cash.

In 1958, Franco Modigliani and Merton Miller argued that firm value is driven by operating and investment decisions, rather than financing or payout decisions. This would imply that firm value is unaffected by the choice between repurchases and dividends and, therefore, any amount of time spent discussing the topic is wasted. Modigliani and Miller, however, made several assumptions in their research. First, the assumption of perfect capital markets assumed no buyer or seller of securities is large enough for his actions to have an appreciable impact on the price; all traders have equal and costless access to information about the securities; no brokerage fees, transfer taxes, or other transaction costs are incurred when securities are bought or sold, and there are no tax differentials either between distributed and undistributed profits or between dividends and capital gains. Second, Modigliani and Miller assumed that all investors exhibit rational behavior. Finally, the



assumption of perfect certainty implies that every investor has complete assurance as to the future investment program and future profits of every corporation (Modigliani and Miller, 1961). In the real world, however, capital markets are not perfect, investors are not rational, and perfect certainty is nonexistent.

The survey by Brav et al. (2005) sheds some light on the actual views of CFOs concerning the relative importance executives place on payout policy. The survey evidence indicates that dividend choices are made simultaneously with (or even a bit sooner than) investment decisions but that repurchase decisions are made later (Brav, et al. 2005). On a scale from -2 (strongly disagree) to +2 (strongly agree), the average rating is -0.3 that investment decisions are made before dividend decisions but the rating is +1.0 that investment decisions are made before repurchases. Evidence from interviews indicates that this difference is not just a question of timing, but of priorities. Interviewed managers say that they would pass up some positive net present value (NPV) investment projects before cutting dividends (Brav, et al. 2005). These responses imply that dividends are not residual cash flows (i.e. left over after investment decisions have already been made), as the Modigliani and Miller theorem suggests they should be. Repurchases, meanwhile, are treated as residual cash flows as implied by Modigliani and Miller (Brav, et al. 2005).

#### A. THE PREFERENTIAL TAX HYPOTHESIS

In many countries, the personal income tax rate on capital gains is lower than the tax rate on dividends. This was true in the United States until the Jobs and Growth Tax Reconciliation Act was passed in 2003. The preferential tax hypothesis states that stock repurchases are preferred over dividends because the personal tax rate on capital gains is lower. Here is the logic: When a firm has excess cash and decides to repurchase stock, there are no taxes paid by shareholders. Assuming zero dividends, investors will only experience gains in the form of price appreciation, or capital gains. Shareholders do not pay taxes on these gains until they realize the gains by selling their stock. Thus, when firms repurchase stock, shareholders have the freedom to make their own decision when to pay taxes on their gains. When a firm pays a dividend, shareholders do not have any control over the timing of their tax payments.

Lie and Lie (2000) empirically examine whether managers consider the tax situation of the firm's investors when deciding the distribution

method by using samples of open market repurchase programs and regular dividends. Their study finds that "firms are more likely to choose open market repurchase programs over regular dividend increases if the firms' shareholders have low tax rates on capital gains relative to tax rates on dividends" (2000). Lie and Lie also discovered another interesting result: Firms are more likely to choose regular dividends rather than share repurchases if the firm's stock has recently experienced a large price appreciation (2000). In this event, investors would pay higher capital gains taxes if they sold their shares in the open market, rather than if they received the cash distribution in the form of a regular dividend increase. The empirical results by Lie and Lie suggest that the choice between dividends and stock repurchases is in fact affected by the tax rate of the firm's shareholders.

While Lie and Lie show that personal taxes paid by a firm's shareholders do affect the firm's payout decision, the survey of CFOs indicates that taxes were of second-order importance to a firm's managers (Brav, et al. 2005). When the survey was administered dividends were taxed at rates as high as 40% for retail investors, while the maximum long-term capital gains tax rate was 20% (Brav, et al. 2005). According to the survey, only 21.1% of dividend-paying firms cited the tax disadvantage as an important factor affecting dividend decisions (Brav, et al. 2005). Likewise, only 29.1% of repurchasing firms cited personal taxes as an important factor affecting the number of shares repurchased (Brav, et al. 2005). Overall, in contrast to the empirical results from Lie and Lie, executives indicate that differential taxes were a consideration, but not a primary concern, in payout policy decisions.

## B. THE TYPE OF SHAREHOLDERS

A related issue is whether the sensitivity of the choice between stock repurchases and dividend increases is affected by the type of a firm's shareholders. Generally, there are two types of investors, institutional and non-institutional. Institutional investors, as the name implies, are institutions. These institutions are able to pool together large sums of capital for the purpose of investment. Some of the more familiar institutional investors include commercial banks, insurance companies, pension funds, hedge funds, and mutual funds. Non-institutional investors are, by definition, any investors that are not institutions. Non-institutional investors are individuals or small organizations who

manage their own money. The type-of-shareholders hypothesis examines whether the method of distribution is affected by whether the majority of a firm's shareholders are institutional investors or Non-institutional investors.

Michael Jensen (1986) suggests that many managerial decisions, such as how to distribute excess capital to shareholders, are affected by a conflict of interest between managers and shareholders. This conflict of interest is known as Agency Theory, or more commonly, the Principal-Agent Problem. The Principal-Agent Problem suggests that a firm's managers (the agents) may choose the course of action that maximizes their own utility rather than the one that maximizes their shareholders' (the principals) wealth. According to Lie and Lie (2000), however, in choosing the method of disbursement, the interests of managers and shareholders appear to be reasonably well aligned. Therefore, "the only reasons why managers may ignore the tax consequences of the disbursement are that they are uninformed about the tax statuses of the shareholders or that they prefer procedures that are the most familiar to them or require the least work to implement" (2000). Institutional investors would theoretically be more capable and willing than non-institutional investors to inform managers about the tax implications of the two distribution alternatives. Furthermore, institutional investors would also be more likely to force managers to choose the alternative that maximizes the after-tax value of the disbursement. Thus, it would be expected that firms with a large fraction of institutional investors would be more sensitive to the shareholders' tax positions. Empirical evidence provided by Lie and Lie (2000) suggests that this is the case. In particular, evidence for the preferential tax hypothesis is stronger for firms with high institutional holdings than for firms with low institutional holdings.

### C. THE CASH FLOW PERMANENCE HYPOTHESIS

The cash flow permanence hypothesis suggests that a firm's decision to distribute excess cash flows in the form of stock repurchases or dividends is based, in part, on the permanence of the excess cash flows. Theoretically, dividend increases would be associated with permanent excess cash flows while share repurchases would be associated with more temporary excess cash flows. When a firm initiates or increases a dividend, it is generally viewed as a positive signal to the market. The

positive signal occurs because the firm knows that its stock price will be severely punished if it decreases or suspends the dividend at any time in the future. Ghosh and Woolridge (1998) show that stock prices decline, on average, by about 6% on the three days surrounding the announcement of a dividend cut. Therefore, if the firm has any doubt that it will not be able to sustain the dividend in the future, it is not likely to initiate or increase a dividend. Instead, the firm is more likely to repurchase stock as a means to distribute its excess cash as the announcement of a share repurchase plan requires no future commitment.

In examining the cash flow permanence hypothesis, Guay and Harford (2000) conducted two tests. First, they tested whether dividends are associated with permanent cash flow shocks and repurchases associated with transient cash flow shocks. Second, under the hypothesis that a firm's choice of cash distribution is driven by its expected cash flow permanence, announcements of dividend increases and stock repurchases will convey different information to investors. When stock prices do not fully anticipate the permanence of the cash flow shock, the market uses the method of distribution (stock repurchase vs. dividend increase) to update its estimate of that permanence. A dividend increase will likely convey more favorable information about the permanence of the excess cash flows than a stock repurchase. The second test by Guay and Harford, therefore, is a prediction about the information conveyed by the method used to make the distribution.

Guay and Harford find, on average that "cash-flow shocks preceding substantial dividend increases are significantly more permanent than cash-flow shocks preceding repurchases" (2000). As part of their analysis, Guay and Harford used control firms that did not change their cash distributions. Compared with these control firms, dividend-increasing firms exhibited significantly more permanent cash flow shocks (2000). In contrast, repurchasing firms' cash flow shocks are no more permanent than those of non-distributing firms (2000). Further, Guay and Harford find that, on average "the market correctly assesses that the cash flows of firms that subsequently increase their dividends are more permanent than those of control firms that do not increase their payout" (2000). This is evidenced by a significantly higher market-adjusted stock return over the two-year period preceding dividend increases. In contrast, the market-adjusted returns of firms that subsequently initiate repurchases are no different from the market-adjusted returns of control firms (2000).

If the cash flow permanence hypothesis is in fact true, there is another possible method for distributing transient excess cash flows to shareholders. In this event, a firm could issue a one-time special dividend to shareholders rather than repurchase its stock. It would be interesting to analyze the differences between special dividends and share repurchases; however, little or no research has been conducted on this specific topic.

## **V. Other Possible Reasons for Share Repurchases**

### **A. INCREASE EARNINGS PER SHARE HYPOTHESIS**

Both the financial press and reports from sell-side research analysts suggest that stock repurchases are often motivated by a desire to increase earnings per share (EPS). Corporate CFOs apparently agree. The survey of CFOs by Brav, et al. (2005) found that repurchases in an attempt to increase EPS is very important. Their results indicating that firms repurchase their stock in order to increase EPS are surprising because, theoretically, this practice does not change the value of a firm. It simply decreases the denominator in the EPS equation and leaves the important factor, net income, unchanged. Wouldn't analysts and investors be able to identify this practice and adjust for the change in EPS accordingly?

Bens, Nagar, Skinner, and Wong (2003) investigate whether a firm's repurchase decisions are affected by their incentives to manage diluted earnings per share. Bens et al. (2003) focus their research on two main predictions: First, they investigate whether executives increase the amount of their firm's repurchases to offset the dilutive effect of securities such as employee stock options (ESOs) that would otherwise reduce diluted EPS. Second, they investigate whether executives increase their firm's stock repurchases when they become aware that their earnings are falling short of the level required to meet EPS growth targets. They find that stock repurchases increase in years when options-related EPS dilution increases and when annual earnings are below the level required to sustain past EPS growth rates (Bens, et al. 2003). Because of their dual focus, however, their sample of firms is limited to firms that face options-related EPS dilution. We are only concerned with the desire to increase EPS, not the desire to increase EPS to offset dilution of ESOs as a motivation for stock repurchases; therefore, the sample selection could skew the results.

Hribar, Jenkins, and Johnson (2006) extend the findings by Bens et al. in several ways. First, Hribar et al. use a sample of firms that is not limited to firms that face options-related EPS dilution. This allows for an investigation into a broader set of questions about the use of stock repurchases to manage EPS. Second, they examine the distribution of accretive (i.e., EPS increasing) stock repurchases conditional on analysts' EPS forecast errors. This shifts the benchmark comparison from historical EPS to analysts' EPS forecasts. Hribar et al. (2006) find a higher than expected proportion of accretive stock repurchases among firms with small, negative "pre-repurchase" earnings surprises. This result is consistent with the belief that firms use repurchases to compensate for earnings shortfalls, or, more specifically, firms use repurchases to meet analysts' EPS estimates when they would not have otherwise met those estimates. Likewise, they find a lower-than-expected proportion of EPS-decreasing repurchases among firms with small positive pre-repurchase earnings surprises (Hribar et al. 2006). This result implies that firms avoid stock repurchases that would induce an earnings shortfall.

Perhaps the most surprising result found by Hribar et al. (2006) is that using a repurchase to meet or beat analysts' EPS forecasts helps firms avoid a potentially large negative stock price response associated with missing analysts' forecasts. This finding indicates that the market does not properly "punish" the stock of a firm that only met or beat analysts' EPS forecasts because the firm repurchased its stock. Furthermore, the results imply that investors simply look at EPS reported by the firm, not other figures such as net income, in making investment decisions. In order to illustrate this finding, consider the following simple example of two firms, A and B:

	<b>Firm A</b>	<b>Firm B</b>
Net Income	\$5,000,000	\$5,000,000
Beg. Shares Outstanding	1,000,000	1,000,000
Shares Repurchased	100,000	0
End. Shares Outstanding	900,000	1,000,000
EPS	\$5.56	\$5.00
Analysts' EPS Estimate	\$5.50	\$5.50
Earnings Beat (Miss)	\$0.06	(\$0.50)

Both firms have 100,000 shares outstanding, report net income of \$5,000,000, and have analysts' EPS estimates of \$5.50 per share. During the year, Firm A, recognizing that it will not meet analysts' EPS estimates, decides to repurchase 100,000 shares of stock. Firm B, meanwhile, decides not to repurchase any shares. At the end of the year, with 900,000 shares outstanding, Firm A reports EPS of \$5.56, beating analysts' expectations by \$0.06. The small EPS beat results in little or no change of Firm A's stock price after the announcement. Firm B, however, with 1,000,000 shares outstanding reports EPS of \$5.00, missing analysts' expectations by \$0.50. The sizeable EPS miss results in a large decline in the price of Firm B's stock.

The empirical results from Hribaret al. (2006) and the above example illustrate the ignorance of investors when firms repurchase their stock in order to meet or beat analysts' EPS estimates. If investors were rational, they would make adjustments to offset the effect of the repurchase by Firm A when comparing its reported EPS to the EPS forecasted by analysts. By not making these simple adjustments for repurchases, however, investors are effectively encouraging firms to continue the practice of repurchasing shares solely for the purpose of increasing EPS. In addition, a firm's managers have an incentive to continue this behavior. Missing EPS estimates generally results in a declining stock price, and executives of companies with lackluster stock performance commonly find themselves in search of new employment.

## B. REPURCHASES AND STOCK OPTIONS

The following two possible explanations for a firm's decision to repurchase stock appear very similar on the surface, but the motivations behind each of them are actually quite different. The first explanation assumes that firms use stock options to compensate their employees. This practice increases the number of shares outstanding, so the firm repurchases shares to maintain a relatively stable total share count. The management stock incentives hypothesis looks at the choice between repurchases and dividends as it relates to the incentives of a firm's executives. This explanation asserts that managers who are compensated with stock options will favor repurchases over dividends because dividends reduce the value of their stock options. Thus, the first explanation assumes managers repurchase shares to offset the dilution of employee stock options, while the second explanation assumes managers

repurchase shares to maximize their own personal wealth.

*1. Employee Compensation and Offsetting Dilution of Employee Stock Option Programs*

Firms grant stock options to their employees for a number of reasons. First, employee stock options increase the flexibility of a firm's cost structure. For example, many small start-up companies lack access to capital, so they use stock options to compensate employees in order to conserve precious cash. Second, employee stock options better align the incentives of a firm's employees with its owners, or shareholders. Finally, employee stock options enhance the incentives for productive behavior throughout the entire firm. For all of these reasons, granting stock options to employees has become increasingly common. The decision to repurchase stock, however, should stand on its own merit and not depend on how the shares were issued. Just because stock has been issued to satisfy options does not mean that stock should be repurchased at a price above true value. Likewise, a stock that sells well below its true value should be repurchased whether or not stock has previously been issued because of outstanding options. In practice, companies often publicly state they are going to repurchase shares with the intent of offsetting dilution from employee stock options. For example, Apple Inc. recently announced a \$10 billion share repurchase program. The company's press release stated that, "The repurchase program is expected to be executed over three years, with the primary objective of neutralizing the impact of dilution from future employee equity grants and employee stock purchase programs" (Apple Inc. press release).

The survey of financial executives by Brav et al. (2005) finds that many companies tie the magnitude of their repurchases, at least in part, to the amount necessary to eliminate earnings dilution by stock option compensation or employee stock plans. Two-thirds of survey respondents report that offsetting dilution is an important or very important factor affecting their repurchase decisions (2005). In contrast, there is virtually no support for the idea that companies repurchase shares instead of issuing dividends because employee stock options are not dividend-protected. Only 10.6% of survey respondents reported this was true (2005). It should be noted, however, that survey evidence clearly has limitations. Despite the assurances of anonymity, it is likely that few financial executives would admit to repurchasing stock instead of paying



dividends in order to maximize their own personal wealth. When put into perspective, the 10.6% of respondents who admit to this practice might actually be quite large and significant.

Weisbenner (2000) examined share repurchases in 1995 and found that total options outstanding, rather than executive options outstanding (which will be covered in the next section), are correlated with repurchase activity. While conducting additional tests, Weisbenner found that both total and executive options are helpful in explaining total payouts. Furthermore, Weisbenner discovered another very interesting result. Weisbenner found that repurchases are timed to offset the accounting effects of dilution in earnings per share, and are not timed to negate the real dilution that occurs upon the exercise of the stock options. This result is consistent with the theory that firms repurchase stock in order to increase earnings per share that was proposed in the previous section.

Klassen and Sivakumar (2001) analyzed repurchase activity and employee and executive option activity for nonfinancial firms for the period 1995-1999. They found that both total options outstanding and executive options outstanding have a positive effect on repurchase behavior (2001). In addition, they found that, in general, the value of the firm was declining in the period preceding the announcement and the announcement had a significant positive effect on the market price of the firm's stock (2001). Klassen and Sivakumar argue that options impose a cost on shareholders by diluting a firm's existing equity because options are not subtracted from income and, therefore, inflate reported profits. If this is true, then investors should recognize this and the degree of abnormal returns should be lower for firms with a large amount of options outstanding. Indeed, Klassen and Sivakumar, in a regression of abnormal returns, find that markets react to stock repurchases less enthusiastically when firms grant options. Investors seem to recognize that employee stock option programs represent a real cost to the firm in the form of share repurchases, likely due to the resultant transfer of wealth from shareholders to employees.

## *2. Management Stock Incentives Hypothesis*

The management stock incentives hypothesis was first suggested by Lambert, Larcker, and Larcker in 1989. Lambert et al. (1989) find that dividends decrease following the initial adoption of a stock option plan for senior-level executives. Moreover, they find evidence that the most

noticeable decreases in dividends occur for firms where a dividend reduction is expected to lead to the greatest increase in the value of a stock option. When a firm decides to pay a cash dividend, the price of the stock will approximately decline by the amount of the dividend on the ex-dividend date (the first day a stock trades without a dividend). Given that the value of a call option depends on the underlying stock price, the value of a call option on a stock that pays a dividend would be less than the value of a call option on a stock without a dividend, all else equal. Specifically, the value of a call option with a dividend is approximately equal to the value of a call option without a dividend less the present value of all future dividends times the delta (price sensitivity of the option to the underlying stock price) of the call option. This implies that executives who own a large number of stock options would have an incentive to repurchase stock instead of paying dividends as a means of distributing excess cash to shareholders. To illustrate the impact of dividends on option values, consider the following two examples.

Example 1: Ignoring signaling and other effects, if a firm worth \$1,000 has 100 shares outstanding (a value of \$10 per share) and pays a total of \$100 in dividends, each share will be worth \$9 after the dividend distribution. If the \$100 is instead used to repurchase ten shares of stock, then the firm's remaining 90 shares will each be worth \$10, just as they were before the repurchase. The value of a call option is greater at a stock price of \$10 (by repurchasing ten shares) than at a stock price of \$9 (by paying a 10% dividend).

Example 2: Suppose a firm worth \$1,000 has 100 shares outstanding and pays a \$50 dividend (dividend yield = 5%). The firm decides to permanently reduce the dividend from \$50 to \$25 (dividend yield = 2.5%). Over the life of a ten-year option (management stock options are typically issued with ten years to expiration), the decision to decrease the dividend yield from 5% to 2.5% results in lower dividends equal to 25% of the value of the firm (ten years times 2.5% per year). Assuming that the average delta of the option is 50%, the decision to permanently reduce the dividend yield by 2.5% will result in an increase in the option value equal to 12.5% of the share price. Thus, the management wealth effect that results from this alteration in dividend policy is substantial.

Fenn and Liang (2001) find a strong negative relationship between dividend yields and the amount of management stock options. Their results imply that a one standard deviation change in the management stock option variable (measured by stock options held by executive

officers as a percentage of total shares outstanding) reduces dividend yields by a statistically and economically significant 38 basis points (2001). Fenn and Liang (2001) also find a significant positive relationship between repurchases and management stock options. Their results suggest that management stock options could help to explain the rise in repurchases at the expense of dividends. In addition, Fenn and Liang (2001) find that the negative relationship between management stock options and dividends is obtained only if options are not dividend-protected. It is actually very rare, however, for stock options to be dividend-protected. Murphy (1998) finds that out of 618 large corporations that granted stock options to their CEOs in 1992, only seven had plans that included dividend protection. Weisbenner (1998) reports that in his sample of 799 companies that granted stock options in 1994, only two offered dividend protection.

Similarly, Jolls (1998) finds that repurchases are significantly more likely when executives have many stock options than when they have few. Jolls takes her analysis one step further and examines not only the relationship between executive stock options and repurchases, but also the relationship between total employee stock options and repurchases. A strong positive relationship between total employee stock options and repurchases would likely indicate that management repurchases shares in order to offset the dilution of options, not necessarily to enhance their own personal wealth by propping up option values. Jolls (1998), however, finds that only executive options, not total employee options, are significant in explaining repurchase behavior. These findings suggest that the rise of executive stock options since the late 1970s may have played a significant role in the increase in share repurchase activity in that time (Jolls, 1998).

## **VI. Conclusion**

The goal of this paper was to explain why companies repurchase their stock. According to basic logic, undervaluation should be the only motivation for a repurchase. Yet, both survey evidence and empirical research illustrate a much different story. Despite failing to identify a single determinant, the paper identifies and examines several possible motives behind a company's repurchase decision by examining the undervaluation hypothesis, the relation between stock repurchases and dividends, and managerial incentives. Undervaluation is consistently

touted as the underlying reason for a repurchase; however, evidence of undervaluation is somewhat inconclusive with regard to repurchases. Furthermore, the relative advantages of share repurchases over dividends (examined in the tax preference hypothesis, the type of shareholders hypothesis, and the financial flexibility hypothesis) appear to have some, however limited, merit in explaining repurchases. Evidence originating from the topic of managerial incentives, specifically the increase earnings per share hypothesis and the managerial stock incentives hypothesis, seems to explain best the popularity of repurchases.

Going forward, future research might include a regression analysis that would empirically analyze the key factors behind repurchase decisions. Several variables should be included in this regression model. First, a variable, such as a market-to-book ratio or a price-to-earnings multiple, should be used to measure whether the stock was undervalued at the time of repurchase. Second, a variable should be included to determine whether the stock was repurchased in order to meet or beat earnings per share estimates. Third, a variable measuring the amount of total employee stock options outstanding should be included to identify whether repurchases were used to counter the effect of options dilution. Finally, a variable measuring the amount of executive stock options outstanding should be included to identify whether repurchases were used to maximize the wealth of executives, as concluded in this paper.

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