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GRADUATE COLLEGE

AN ANALYSIS OF THE TAX-RATE DIFFERENTIAL BETWEEN ORDINARY AND CAPITAL GAINS TAX-RATES AND ITS EFFECT ON THE STRUCTURE OF CORPORATE PAYOUTS

A Dissertation

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

Degree of

Doctor of Philosophy

By

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Norman, Oklahoma
2001

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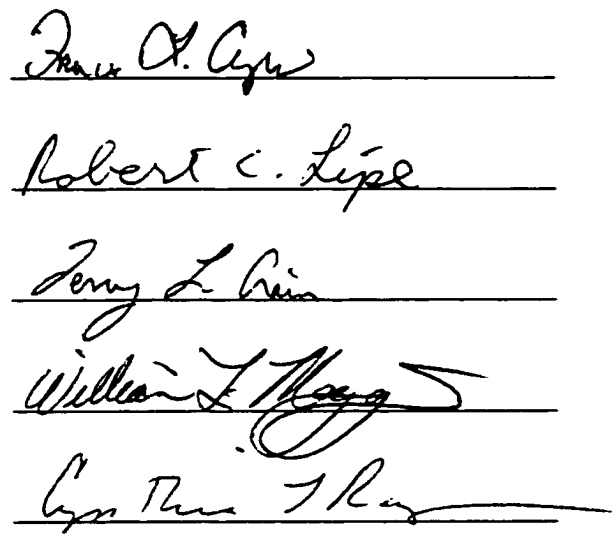
AN ANALYSIS OF THE TAX-RATE DIFFERENTIAL
BETWEEN ORDINARY AND CAPITAL GAINS TAX-RATES
AND ITS EFFECT ON THE STRUCTURE OF CORPORATE PAYOUTS

A DISSERTATION APPROVED FOR THE
MICHAEL F. PRICE COLLEGE OF BUSINESS
(SCHOOL OF ACCOUNTING)

BY



ACKNOWLEDGMENTS

As I reflect on the past four years spent in the Ph.D. program at the University of Oklahoma, I realize there are many people I owe a debt of gratitude. Completing the program has been a long and tedious journey. However, it has been a journey filled with challenges and obstacles that have made me stronger and taught me the value of perseverance.

I would first like to thank Fran Ayres, my dissertation chair, for the valuable advice, support, and inspiration she has provided me. She has been a cherished role model and friend throughout my program.

I would also like to give a special thanks to Bob Lipe. Bob always believed in me and challenged and expected me to be the best I could be. His endless efforts and tireless reading of my dissertation did not go unnoticed. Few individuals would be so unselfish and so giving with their time. I feel fortunate to have benefited from his knowledge.

I would also like to express my gratitude to Terry Crain, Chris Knapp, and Lee Willinger. Each of you provided me with much encouragement during the MACC program and the early years of my Ph.D. program. Terry's insistence from the beginning of my program that I have a publishable paper, in addition to my dissertation, has proved to be invaluable advice. Chris, you make the office a happier place to be and Lee, you believed in me when many others might not have.

I would also like to thank Steve Butler, Andy Cuccia, Dipankar Ghosh, Marlys Lipe, and Jeff Payne for their support and advice over the last four years. Each of you has been a factor in my growth as a student and my development as an individual. I also

appreciate the many contributions of my other committee members, Bill Megginson and Cindy Rogers. Your comments were always helpful, constructive, and provided much insight. Also, thanks to Linda Flaming, Roxanne Gooch, and Alex Lee for your friendship during our time together in the Ph.D. program. The program was often tough, but it was worth it having the three of you to share it with.

Finally, I wish to thank my family. My parents, Norman and Pat Hart, were always supportive and taught me to believe I could accomplish anything if I set my mind to it. Kelli and Paul, each of you offered an ear or a word of support when the going got tough. Thanks to each of you!

Without a doubt, my greatest thank you goes to my little boy, Hunter. Your smile, sense of humor, and genuine love were always there to remind me of what is most important to me. The fun times you brought to my life added balance to the structure and rigor of my Ph.D. program and helped me maintain a positive attitude. I feel very fortunate to have you in my life. To you, this dissertation is lovingly dedicated.

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ABSTRACT OF DISSERTATION

Prior studies mention the difference between ordinary and capital gains tax rates as one possible factor contributing to the growth in share repurchases. However, the relation between the tax-rate differential and buybacks has not previously been examined. This study finds personal income taxes are associated with the corporate payout decision. As the tax-rate differential increases, I find share repurchases become a larger percentage of total corporate payout and that repurchase programs become larger. Conversely, when the tax-rate differential becomes smaller, management increases the dividend payout ratio and decreases the percentage of payout in the form of share repurchases. Therefore, the findings suggest that management considers statutory personal tax-rates when setting corporate payout.

1. INTRODUCTION

In a seminal paper, Miller and Modigliani (1961) demonstrated that shareholders in a frictionless market would be indifferent between capital gains and the payment of dividends. But, when income taxes are introduced, their proposition no longer holds. If the tax rate on ordinary income is higher than capital gains income, shareholder wealth is maximized when no dividends are paid out. Consequently, for companies that decide to distribute cash to investors, the introduction of a large tax-rate differential that favors capital gains imposes a friction that should produce a preference for share repurchase programs over dividends.[1]

To spur personal investment growth in corporate stock, the U.S. tax code has almost always provided lower rates for capital gains on the sale of stock by individuals. During the time period 1982 through 1986, the differential between tax-rates on ordinary and capital gains income was 30% (see Table 1). From 1987-1989, the tax-rate differential was lowered to zero as a result of the Tax Reform Act of 1986 (TRA '86).[2] Since that time, the differential has broadened three times to the current difference of 19.6%.[3] Since dividends are taxed at ordinary rates, the lower rates applied to capital gains cause investors to prefer firms that distribute excess cash in the form of a repurchase program.

In 1998, nonbank S&P 500 companies paid out nearly $150 billion to repurchase their own shares of stock. This amounted to $35 billion more than paid in dividends by these same firms in 1998. The Securities Data Company (SDC) of Newark, N.J. calculates the dollar value of all buybacks exploded from $26 billion in 1991 to $222 billion in 1998 as the tax-rate differential between ordinary and capital gains tax rates

increased from 3% to 19.6% (Table 2 displays aggregate payout statistics for 1982-1998). While prior studies mention the difference between ordinary and capital gains tax rates as a possible factor contributing to the growth in share repurchases,[4] the relation between the tax-rate differential and share repurchases has not previously been examined.

This paper examines whether management attempts to save their shareholders personal income taxes. Lie and Lie (1999) find indirect evidence that shareholder tax implications affect how firms distribute cash to shareholders. Their findings suggest that firms who have experienced small recent stock price increases (a proxy for capital gains) and low dividend yield (a proxy for shareholders' relative tax rates) are more likely to choose a share repurchase program over a dividend increase. I expect the results of this analysis to further expand our understanding of how taxation affects managerial decisions concerning corporate payout methods.

The purpose of this paper is to investigate the relation between the tax-rate differential on ordinary versus capital gains income and a firm's choice of payout method (i.e., stock repurchases and dividends). Specifically, I examine whether corporations increase repurchases and decrease the dividend payout ratio as the tax-rate differential widens. Further, I examine whether the tax-rate differential prompts a substitution effect between corporate payout methods.

The results suggest that firms do attempt to save their shareholders income taxes. As the tax-rate differential widens, share repurchase programs become larger and buybacks become a larger percentage of the total corporate payout of firms. Conversely, I find the dividend payout ratio declines as the tax-rate differential increases. Both findings

are consistent with personal income taxes influencing managerial decisions regarding the payout of excess corporate funds.

This paper is organized as follows. The next section describes the effect of income taxes on share repurchases along with a description of the various types of share repurchase programs. Sections 3 and 4 consist of a review of the related literature and the development of the hypotheses to be tested. Next, section 5 addresses model specification, research design, and sample selection. The results and concluding remarks are provided in the final two sections.

2. SHARE REPURCHASE PROGRAMS

While dividends give rise to an immediate income tax liability at ordinary tax-rates for investors, the tax consequences of a share repurchase program can be quite different.[5] Shareholders choosing to sell stock back to the company will be liable for capital gains tax on the excess of the sales price over the shareholder's basis in the shares. The magnitude of the personal tax advantage from repurchases depends on each shareholder's cost basis and their individual marginal tax rate.

Shareholders who choose not to participate in a repurchase program may experience a large (unrealized) capital gain due to the positive signal associated with repurchases. As a result of a buyback, fractional ownership of the company increases for non-participating shareholders as shares outstanding decline. Thus, share repurchase programs seemingly offer an alternative, tax-advantaged method for firms to distribute cash to investors, while simultaneously benefiting non-participating shareholders through increased stock price and increased proportional ownership.

2.2 Types of Share Repurchase Programs

Four methods are primarily used to execute a share repurchase program: (1) open-market repurchases, (2) tender-offer repurchases[6], (3) dutch-auction repurchases[7] and (4) privately negotiated transactions.[8] According to the Securities Data Corporation, 90% of all repurchase programs announced between 1985 and 1996 were open-market transactions. They generally involve buying back stock at market prices over a period of time, ranging from several months to several years. The firm pays the normal commission, and the seller is generally not aware of the fact that he is selling to the corporation.

Prior research suggests that open-market transactions are announced in hopes of signaling good news to investors. On average, the announcement of a repurchase program prompts positive abnormal stock price performance (see, for example, Comment and Jarrell, 1991; Dann, 1981; Ikenberry, Lakonishok, and Vermaelen, 1995; and Vermaelen, 1981). While signaling appears to have been a contributing factor to the recent rise in repurchase activity, tax factors offer an attractive alternative to dividend increases and may be an additional motivation.

Prior to 1982, a repurchase announcement could be viewed as a violation of S.E.C. rules, prohibiting companies from manipulating their stock price. The adoption of S.E.C. rule 10b-18 in 1982 requires a firm to announce its intention to repurchase shares on the open-market or through privately negotiated transactions to qualify the repurchase under the "safe harbor" rule of the Securities and Exchange Act.[9] Ikenberry et al. (1995) conclude that the adoption of this rule caused an increase in the number of open-market repurchase programs due to the resolution of the legal ambiguity.

3. PRIOR LITERATURE

3.1 The Motivation to Pay Out Corporate Cash

Rozeff (1982) and Easterbrook (1984) argue increased payouts to shareholders reduce the volume of funds over which management has discretionary control, thereby lessening managerial power and reducing agency costs. Jensen (1986) states further that the conflict of interest between shareholders and managers over payout policies is especially severe when the organization generates substantial free cash flow.[10] The desire to reduce agency costs motivates managers to pay out free cash flow rather than investing it at below the cost of capital or wasting it on organizational inefficiencies. For example, in 1994, after Chrysler Corporation's record profits resulted in a large stockpile of cash, Kirk Kerkorian, Chrysler's largest shareholder, forced Chrysler to disgorge cash through a dramatic increase in dividends and the announcement of a $1 billion stock buyback program.[11] The Chrysler case provides anecdotal evidence that shareholders demand that managers with substantial free cash flow either increase dividends or pay out cash in the form of repurchases.

3.2 Alternative Means of Corporate Payout Methods

Positive stock price responses and signaling are two reasons offered in prior literature to explain the recent increase in repurchase activity. Additionally, tax savings are often mentioned as an impetus for increased repurchases. Often, when firms undertake a share repurchase program, managers state that the prevailing market price of their firm is understated. For this reason, managers see their own stock as a good investment for the company (Dann,1983; Wansley, Lane, and Sarker, 1989). Thus, management gives an information signal to investors by repurchasing their own stock.[12]

The repurchase then represents an attempt to allow current shareholders to capture the value of the inside information (Vermaelen, 1981).

Empirical evidence from a number of studies supports the theory of undervaluation as the reason for undertaking share repurchase programs (Dann, 1981; Vermaelen, 1981; Comment and Jarrell, 1991; Ikenberry et al., 1995). Further, several studies have documented that, on average, stock repurchases evoke a significantly higher stock price response than a dividend increase (Aharony and Swary, 1980; Dann, 1981; Masulis, 1980; Vermaelen, 1981). In addition, Vermaelen (1981) has shown that while the price per share increase subsequent to a repurchase announcement drops in the "aftermarket," a portion of the price increase is permanent in the sense that the price in the "aftermarket" remains higher than the price prior to the repurchase announcement.

Ikenberry et al. (1995) find abnormal performance of approximately 3.5% in the days surrounding the announcement of a repurchase program and annualized abnormal performance of 2.9% over a four-year period following the announcement. Additionally, they ascertain that firms with high book to market ratios (i.e., undervalued stocks) observe annualized abnormal returns as high as 6.4% over a four-year post-announcement period. Vermaelen (1981) finds the future earnings per share of tendering firms to be above the predictions of a time-series model. He interprets this as evidence that the repurchase serves as an announcement of favorable earnings prospects.

Ikenberry and Vermaelen (1996) note that, in 1994, the adoption of repurchase programs was so prevalent, one in every four firms in the S&P 500 initiated a program. They state further that it seems unlikely that so many managers of the U.S.'s most closely monitored firms would find their stock undervalued at the same point in time. From 1994

to the present, repurchase activity has continued to grow despite the prosperous bull market of the 1990's. Therefore, while undervaluation may explain why some firms repurchase, the continued popularity of repurchases at a time when stock indices are at record levels suggests that alternative explanations may exist.

Three alternative explanations are 1) growth in stock option plans, 2) the flexibility inherent in buyback programs, and 3) the lower capital gains rates applicable to the sale of an individual's stock. Barth and Kasznik (1999) note that approximately 20% of share repurchase press releases cite obtaining shares to fulfill the needs of stock option plans as a motivating factor in a repurchase. Firms are concerned that issuing new shares of stock will dilute the value of the existing shareholders' stock. Barth and Kasznik (1999), Fenn and Liang (1999), and Dunsby (1995) provide evidence that repurchase activity is positively associated with stock option plans. Therefore, buyback programs are undertaken to obtain the needed shares of stock.

A repurchase provides a flexible method of paying cash to shareholders. Firms may replace some portion of their dividends with repurchases or, consistent with the findings of Jagannathan et al. (1999) and Dunsby (1995), they may use repurchases as a supplemental payout method. Research has shown that firms reduce dividends as a last resort because of the negative signal it sends (DeAngelo and DeAngelo, 1990; DeAngelo, DeAngelo, and Skinner, 1992; and Denis, Denis, and Sarin, 1994). Megginson (1997, p. 357) notes that if firms cut or eliminate their dividends they are severely punished by the stock market, sometimes witnessing stock price declines of up to fifty percent. Furthermore, Michaely, Thaler, and Womack (1995) document that a dividend omission elicits a much larger negative stock price reaction than the positive reaction experienced

by its mirror image, a dividend increase. The failure to renew a repurchase program does not elicit the negative response associated with a dividend omission. Therefore, initiating or increasing a buyback program offers a level of flexibility not available with dividends.

Ikenberry et al. (1998) find that open-market share repurchase announcements are in no way a firm commitment to buy back shares of stock. They merely offer the firm the flexibility to undertake a repurchase program if the firm so desires. Interestingly, they found that firms buy back, on average, only 28% of the shares authorized, although the completion rate is higher in more recent years (Ikenberry et al., 1998).

Ofer and Thakor (1987) mention that repurchases offer the firm greater timing flexibility than dividends since the latter are usually paid quarterly at fixed points in time. In a cross-sectional analysis of firms' decisions to increase dividends or execute a share repurchase program, Jagannathan et al. (1999) find the two are used at different times. Stock repurchases are found to be highly pro-cyclical[13] while dividends increase steadily over time, consistent with the flexibility hypothesis.

Over the period 1985-1996, Jagannathan et al. (1999), document some systematic differences between dividend-increasing and repurchasing firms. Repurchase-increasing firms are found to have significantly less operating income than firms that only increase dividends. Consequently, their results suggest that dividends are paid out of "permanent" operating cash flows while repurchases are paid out of "temporary" non-operating cash flows. The authors surmise that firms which pay out dividends follow a historical policy of paying out cash flows, while repurchases are less frequent events used to pay out cash surpluses.

Jagannathan et al. (1999) also find repurchases are considerably more volatile than dividends. Repurchases are shown to be responsible for a disproportionately large fraction of the variation in total payouts, while dividends represent the "smooth" expected portion of payouts. The authors conclude that repurchases do not appear to be replacing dividends; rather they seem to serve the complementary role of paying out short-term cash flows. Similarly, Fenn and Liang (1999) document that the volatility of operating income has a significant positive relation to the percentage of payouts made through repurchases and a negative relation to dividends.

Finally, Dunsby (1995) mentions the increasing use of repurchases may be a result of firms' learning of the tax advantages associated with repurchases. This reference to the tax advantage of share repurchases is mentioned in most papers studying the recent rise in repurchase activity. However, the differential taxation of capital gains and ordinary income has not been empirically examined to determine its impact on share repurchase behavior.

4. HYPOTHESIS DEVELOPMENT

Over the last decade, the explosive growth of open-market repurchase programs has allowed buybacks to gain in prominence as a corporate payout method. During the time period 1987-1998, the tax-rate differential has gradually widened, favoring capital gains. Because share repurchase programs receive capital gains treatment, whereas dividends are taxed as ordinary income, the increasing tax-rate differential allows firms to distribute cash to their shareholders in an increasingly tax-advantaged manner. This leads to the first hypothesis, stated in alternative form:

H1: The tax-rate differential between ordinary and capital gains tax-rates is positively associated with share repurchase activity.

Although this study proposes that share repurchase activity increases as the tax-rate differential becomes larger, I do not assume the lure of capital gains treatment will eliminate dividend payments altogether. As mentioned in Easterbrook (1984), investors value a steady stream of dividends over the uncertain prospect of a large return when a firm liquidates or is sold as a going concern, and firms cater to that preference. Further, repurchase programs can not replace dividends as a company's ongoing proportionate payout plan because the I.R.S. has the power to impose ordinary tax rates on cash received as part of a pro-rata repurchase program. For these reasons, I do not expect a negative relation between dividends per share and the tax-rate differential.

Unlike dividends per share, the dividend payout ratio may decline in response to an increased tax-rate differential. A large tax rate differential may prompt a company to repurchase shares rather than increase dividends per share during periods of earnings growth when excess cash is available. As a result, the payout ratio will decline if dividend per share is held constant or else grows at a slower rate than earnings (the denominator). Coca-Cola is a good example of a corporation that slowed its dividend payout ratio when the company began repurchasing shares of its own stock. Coca-Cola included the following statement in their 1984 annual report (p. 35), the year they began repurchasing shares:

> *...Management plans to increase the percentage of earnings invested in the business by raising dividends annually at a rate lower than previous years' growth in earnings per share, thus decreasing over time the dividend payout ratio.*

Coca-Cola suggests what might have been meant by the preceding statement in its 1989 annual report (p. 29) which says:

> *...Since 1984 we have found our own common stock an excellent investment opportunity...Investing in our own stock offers the potential for a significantly higher long-term return than maintaining excess cash, which provides a relatively low after-tax return.*

Thus, it appears that Coca-Cola reduced its dividend payout ratio to allow for increased repurchases. An increase in the tax-rate differential provides an additional incentive to increase repurchases rather than increase dividends per share. Following is the second hypothesis, stated in alternative form.

H2: The tax-rate differential between ordinary and capital gains tax-rates is negatively associated with the dividend payout ratio.

In the 1950's, nine out of ten American companies paid dividends. Today only one in five pays dividends (The Economist, Nov. 20, 1999, p. 93). Young "growth" companies such as Microsoft, Dell, America Online, and Cisco, have never paid a dividend and currently have no plans to do so. However, some of these companies, notably Microsoft, engage in large buyback programs. Consequently, for some repurchasing firms, a choice is being made between dividends and repurchases. However, many repurchasing firms also pay large dividends. For these firms, a less direct tradeoff may be occurring with respect to dividends and repurchases as the tax-rate differential increases. The increase in total corporate payout during the 1980's and 1990's has occurred through stock buyback programs. Despite decreased dividends, an analyst for J.P. Morgan calculates the total payout ratio has been quite steady throughout the 80's and 90's as long as both dividends and buybacks are counted (The Economist, Nov. 20, 1999, p. 93). Therefore, I test whether increases in the tax-rate differential are associated

with an increased proportion of total payout in the form of repurchases. In other words, are firms changing the form and structure of corporate payout as a result of taxation? This leads to hypothesis three stated in alternative form:

H3: The percentage of total corporate payout in the form of repurchases is positively associated with the tax-rate differential.

In addition to regular cash dividends and share repurchases, management can distribute 'extra', 'special', or 'year-end' cash dividends. Specially designated dividends (specials) tend to be large in dollar size compared to regular dividend increases, often equaling or even exceeding the regular quarterly dividend (Brickley, 1982, 1983). Unlike regular dividends, special dividends are a flexible cash distribution method with no future expectation or implied commitment of continued payout, similar to a repurchase program. Consistent with this view, Brickley notes the labeling of special and regular dividends inherently conveys a warning to stockholders that the "special" payout is not as likely to be repeated as the "regular" payout. As expected, he finds unanticipated special dividends are associated with weaker stock market reactions than regular dividend increases of similar size.

While repurchases and specials are similar in many respects, they differ in their tax treatment. Specials are taxed as ordinary income and do not receive the more favorable capital gains treatment afforded repurchases. Therefore, if taxes matter, repurchases should gain in momentum and specially designated dividends should decline in popularity as the tax-rate differential increases. Following is hypothesis four, stated in alternative form:

H4: The ratio of specially designated dividends to corporate payout in the form of repurchases and specially designated dividends is negatively related to the tax-rate differential.

5. MODEL SPECIFICATION AND RESEARCH DESIGN

5.1 Corporate Payout Models

5.1.1 Share Repurchase Model

Based on earlier analysis and discussion, H1 is tested by modeling repurchases as a function of the following variables (**expected sign in parentheses**):

$$\frac{\$REPURCH_{it}}{MVSTOCK_{it}} = \beta_0 + \beta_1 RATEDIFF_t + \beta_2 INDAMKBK_{it-1} + \beta_3 CASH_{it-1} + \beta_4 \sigma OPROE_{it} + \beta_5 NONOP_{it}$$

$$(+) \qquad (-) \qquad (+) \qquad (+) \qquad (+)$$

$$+ \beta_6 STOCKOP_{it} + \beta_7 \Delta GDP_{t-1} + e_{it} \qquad (1)$$

$$(+) \qquad (+)$$

where,

$\frac{\$REPURCH_{it}}{MV\ STOCK_{it}}$ = actual dollar value of share repurchases by firm i during year t as a percentage of the total market value of common stock.

$RATEDIFF_t$ = the difference between capital gains and ordinary income tax rates in effect during year t.

$INDAMKBK_{it-1}$ = the ratio of the average total market value of equity to total book value of equity for firm i's industry, subtracted from the total market value of equity to total book value of equity for firm i, at year t-1.

$CASH_{it-1}$ = the sum of cash, marketable securities, and short-term investments, scaled by market value of equity, all at time t-1.

$\sigma OPROE_{it}$ = the standard deviation of operating income, scaled by market value of equity, for the three years preceding each observation.

$NONOP_{it}$ = non-operating income for firm i, scaled by market value of equity.

$STOCKOP_{it}$ = size of stock option plan, calculated as the number of shares reserved for each firm's stock option plan, scaled by the number of shares outstanding.

ΔGDP_{t-1} = the change in the gross domestic product from year t-1 to year t.

The dependent variable, \$REPURCH/MV STOCK, measures the annual dollar value of shares actually repurchased by each firm as a percentage of its total market value

of common stock. An additional dependent measure of repurchase activity is also analyzed. A dummy variable indicating whether or not a firm repurchased shares during the year (REPURCHASER) is examined using a Logit model.

The coefficient on RATEDIFF measures the responsiveness of share repurchase activity to the difference between tax rates on capital gains and ordinary income. Share repurchases become a more tax-advantaged form of corporate payout as the tax-rate differential increases. If corporations consider shareholder taxation when selecting payout methods, then H1 predicts a positive relation between the dependent variable and the tax-rate differential.

The remaining variables are included in the model to control for other factors that affect the initiation and execution of share repurchase programs. INDAMKBK is the industry adjusted market-to-book value ratio. It equals the total average market value of equity divided by the total average book value of equity for firm i's industry, subtracted from the total market value of equity divided by the total book value of equity for firm i at year t-1. This ratio measures how the stock market values a company's net assets relative to the valuation in each company's industry. It is included in the model to control for the prior finding that companies initiate repurchase programs because their stock is undervalued. The estimated coefficient on INDAMKBK is predicted to be negative.

Bagwell and Shoven (1988) find free cash flows, defined as operating income before depreciation, scaled by total assets, to have a positive relation to the probability of repurchase. Moreover, Barth and Kasznik (1999), find idle cash flow and fewer investment opportunities are positively related to repurchase announcement likelihood. In this study, a stock as opposed to a flow variable is used to model excess temporary cash.

A stockpile of cash can result in increased agency costs for the firm, and shareholders will demand the cash be disgorged. Hence, the variable CASH is predicted to have a positive coefficient. CASH is computed as the sum of year t-1 ending cash balance, marketable securities, and short-term investments, scaled by market value of equity. Its primary purpose is to capture the dollar value of the firm's excess cash.

Jagannathan et al. (1999) compare firms that repurchase to firms that increase dividends and find that repurchasing firms have higher non-operating income and greater volatility in their operating income prior to a repurchase. To control for these two factors, I include their variables in my model. σOPROE is the standard deviation of a firm's prior three years of operating income scaled by market value of equity, and NONOP equals non-operating income scaled by market value of equity. Both variables are predicted to have a positive influence on repurchase activity.

Following Bartov et al. (1998) and Barth and Kasznik (1999), I include stock option plan size in the model to control for the link between options and share repurchases. This proxy is computed as the number of shares reserved for a firm's stock option plan, scaled by the number of shares outstanding. A positive relation is expected between the variable STOCKOP and repurchase activity.

Lastly, better economies may lead to overall growth in corporate payouts. Therefore, ΔGDP, the change in the gross domestic product from year t-1 to year t, is included in the model to control for increased repurchase activity due to economy-wide effects. A positive relation is predicted between share repurchases and ΔGDP.

5.1.2 Repurchases and Dividends

In model (1), I examine whether the tax-rate differential has an effect on the level of repurchase activity (scaled by market value of equity). An alternative approach is to directly test the impact of the tax-rate differential on the tradeoff between dividends, repurchases, and specially designated dividends. To model the tradeoff posited in hypothesis three, I use the percentage of total payout distributed in the form of repurchases as the dependent variable. If taxes matter, then changes in the tax-rate differential should affect the method by which corporations distribute cash. Hence, repurchases should represent a larger percentage of total payout as the tax-rate differential increases. The following model is used to test hypothesis three (**expected sign in parentheses**):

$$\frac{\$REPURCH_{it}}{\$PAYOUT_{it}} = \gamma_0 + \gamma_1 RATEDIFF_t + \gamma_2 INDAMKBK_{it-1} + \gamma_3 CASH_{it-1} + \gamma_4 \sigma OPROE_{it} + \gamma_5 NONOP_{it}$$

$$(+) \qquad (-) \qquad (+) \qquad (+) \qquad (+)$$

$$+ \gamma_6 STOCKOP_{it} + e_{it} \qquad (2)$$

$$(+)$$

where,

$\frac{\$REPURCH_{it}}{\$PAYOUT_{it}}$ = the dollar value of share repurchases in year t, divided by the sum of the dollar value of dividends, repurchases, and specially designated dividends.

The remaining variables are defined the same as in model (1).

The dependent variable, $REPURCH/$PAYOUT, measures the proportion of a firm's total payout structured as a stock repurchase. A positive relation is expected between the dependent variable and RATEDIFF. The predictions for the remaining variables are the same as in model (1). The variable ΔGDP does not appear in model (2) because it is not expected to affect the tradeoff between types of distributions, but rather,

the level of distributions. Table 3 displays the variables and the hypothesized signs of the regression coefficients for models (1) and (2).

5.1.3 Repurchases and Specially Designated Dividends

Both buybacks and specially designated dividends provide a flexible mechanism to distribute cash to shareholders. However, these two payout methods have different tax consequences. Hypothesis four examines the relation between these two differentially taxed payout methods and the tax-rate differential. A reduced version of model (1) is utilized to test the tax-tradeoff between repurchases and specially designated dividends. The model is as follows **(expected sign in parentheses)**:

$$\frac{\$SPECIALS_{it}}{\$SPECIALS+\$REPUR_{it}} = \gamma_0 + \gamma_1 RATEDIFF_t + \gamma_2 INDAMKBK_{it-1} + \gamma_3 STOCKOP_{it} + e_{it}$$

(-) (?) (-) (3)

where,

$\frac{\$SPECIALS_{it}}{\$SPEC+\$REPUR_{it}}$ = the dollar value of specially designated dividends in year t divided by the sum of the dollar value of specially designated dividends and share repurchases.

The remaining variables are defined the same as in model (1).

The dependent variable for this regression is the ratio of specially designated dividends to corporate payout in the form of repurchases and specially designated dividends ($SPECIALS/$SPECIALS + $REPUR). As the tax-rate differential increases, specials are predicted to decline. Accordingly, a negative coefficient is expected for the variable RATEDIFF. As mentioned, undervaluation is the most common reason cited in prior research for repurchasing stock. For this reason, INDAMKBK is included in model (3). Undervaluation has previously been found to have a positive effect on share repurchase activity. However, its effect on specially designated dividends is uncertain. Therefore, no sign is predicted for INDAMKBK. Finally, STOCKOP controls for the

effect of stock option plan size on a firm's repurchase behavior. A negative relation is predicted between the dependent variable and STOCKOP. Table 4 displays the variable definitions and hypothesized signs for model 3.

5.1.4 Sample for Repurchase Models (H1, H3, and H4)

All firms which disburse cash through either share repurchase programs or dividends, including specially designated dividends, and meet all data requirements during the time period 1985-1998, are included as firm-year observations in models (1) and (2) to test hypotheses H1 and H3. Only those firms that disburse cash through repurchases or specially designated dividends are included as observations in model (3) to test H4. Firms that do not disburse cash through any payout method will not be affected by the tax-rate differential and are therefore not included. The sample is comprised of nonregulated[14], calendar-year, U.S. firms that are not banks or credit institutions.[15] Large repurchases may be motivated by a desire to change a firm's capital structure. Since I am interested in whether taxation affects the payout of idle cash, I eliminate all firm-years in which repurchases total more than 30% of the market value of stock in a given year. Therefore, I have deleted 265 firm-years with repurchases greater than 30%.[16]

The period 1985-1998 is chosen as the sample time period for this study. As a result of SEC Rule 10b-18 in 1982, which eliminated the legal ambiguity associated with repurchases, stock buybacks underwent tremendous growth during 1983 and 1984. Therefore, I begin the sample in 1985 when repurchase activity leveled off after the introduction of S.E.C. Rule 10b-18.[17] The repurchasing data used to form all three dependent variables is obtained from the *Compustat* industrial and research files. Annual

data item number 115, Purchases of Common and Preferred Stock, is used to measure the dollar value of repurchase programs. Consistent with prior research, share repurchases during the fourth quarter of 1987 are excluded from the sample to avoid clustering associated with the large number of repurchases after the stock market crash of 1987. During 1987, 507 of the 606 program announcements occurred after October 19, with 400 of these occurring between October 19 and October 31 (Jagannathan, 1999).

The data to form the variables INDAMKBK, CASH, σOPROE, NONOP, and STOCKOP are from the annual *Compustat* industrial and research files. I calculate the denominator of $REPURCH/$PAYOUT, using the dollar values of ordinary and specially designated dividends from CRSP.[18] Next, per share information is multiplied by the number of common shares outstanding acquired from *Compustat,* resulting in total dividends and total specials. Total special and regular dividends are added to the total dollar value of share repurchases to form the variable $PAYOUT.

5.2 Dividend Payout

H2 predicts the tax-rate differential has an effect on the dividend payout ratio of the firm. A dividend payout model originated by Rozeff (1982), along with a variable that measures the tax-rate differential is employed to test the second hypothesis. Rozeff's original model has been cited or else used as the basis for numerous finance papers. Dempsey and Laber (1992) extended Rozeff's (1982) original analysis by replicating his results to a later time period, (1981-87). Despite the different economic conditions present in the two time periods, the estimated regression not only holds up well in terms of explanatory power, but it is statistically indistinguishable from that estimated for Rozeff's original time period (1974-1980). These two studies seem to indicate that

Rozeff's dividend payout model possesses the requisite structural stability necessary over time.

5.2.1 Dividend Payout Model

Hypothesis 2 is tested using the following cross-sectional regression model:

$$PAY_{it} = \phi_0 + \phi_1 RATEDIFF_{it} + \phi_2 GROW1_{it} + \phi_3 GROW2_{it} + \phi_4 BETA_{it} + \phi_5 INS_{it} + \phi_6 STOCK_{it} + e_{it}$$

(-) (-) (-) (-) (-) (+) (4)

where,

PAY_{it} = the annual dividend payout ratio, computed as dividends/earnings.

$RATEDIFF_{ij}$= the difference between capital gains and ordinary income tax rates in effect during the year of each observation.

$GROW1_{it}$ = the average realized growth rate of revenues for firm i in the five-year's preceding the year being tested.

$GROW2_{it}$ = the forecast of the growth rate of revenues for firm i over the five year's following the year being tested.

$BETA_{it}$ = estimated market model beta.

INS_{it} = percent of common stock held by the insiders of firm i.

$STOCK_{it}$ = the natural logarithm of the number of common stockholders of firm i.

The dependent variable for model (4) is the firm's dividend payout ratio for each year of the sample, 1985-1998. The dividend payout ratio is computed by dividing total dividends paid during the year by net income for the year. If a company has negative earnings for a particular year, the payout ratio is undefined and the observation is deleted.

The variable RATEDIFF is a measure of the difference between ordinary and capital gains tax-rates. It measures the responsiveness of a firm's dividend payout ratio to an increasing tax-rate differential. The coefficient on RATEDIFF is predicted to be negative.

Of the independent variables, three of the variables are employed as a surrogate for the transaction cost of financing required by external issues. The first is the average realized growth rate of revenues over the five-year time period preceding the year being tested. The second variable is the forecast of the growth rate of revenues over the five-year period following the year being tested. Both variables control for the negative relation between growth firms and dividend payout. If past growth has been rapid, a firm will tend to retain funds to finance future growth and to avoid the costs of external financing. Similarly, if rapid growth is anticipated in the future, a prudent management will conserve on funds by establishing a lower payout ratio now, so external financing will not be necessary. Thus, a negative relation is expected between both the past and future growth rate of revenues and a firm's dividend payout ratio.

The third surrogate for the transaction cost of external financing is each firm's estimated beta coefficient. The role of beta has been shown in the literature to reflect a firm's operating and financial leverage (Lev, 1974, and Hamada, 1971, respectively). A firm's beta is higher insofar as a firm has higher operating and financial leverage. Therefore, as a firm's leverage increases, beta will increase indicating higher interest payments and fixed expenses, resulting in less total cash available for dividends. Thus, a negative relation is predicted.

Next, two variables are incorporated in the model to control for the effect of agency costs on the dividend payout ratio of the firm. The first is the percentage of stock held by insiders. As the percentage increases, agency costs will decrease and a lower dividend will be demanded as part of the optimum monitoring package of the firm.

Hence, a negative relation is expected between dividend payout and the percent of common stock held by insiders.

The second variable, the natural logarithm of the number of common stockholders, measures the dispersion of ownership of outside stockholders. If a company's stock is held by fewer shareholders, the ownership of the firm will be more concentrated and may more easily influence managerial behavior. This would result in reduced agency costs, which would lead to a lower optimal dividend payout. A positive relation is predicted between dividend payout and the dispersion of shareholders in the firm. Table 5 displays the variables used in model (4), variable abbreviations, and the hypothesized sign of the regression coefficients.

5.2.2 Sample for Dividend Payout Model (H2)

To test the dividend payout model, a random sample of firms is chosen from the sample of repurchasing and dividend-paying firms utilized to test models (1) and (2). Two hundred firms meeting all data requirements were randomly selected for each year of the sample, 1985-1998, resulting in 2200 firm-year observations. Due to missing data, 1666 firm-year observations are included in the dividend payout regression. All variables are hand-collected from the *Value Line Investment Survey.*

5.3 Alternative Measure of the Tax-Rate Differential

The variable RATEDIFF assumes that the entire amount of cash paid for repurchases is taxed as a capital gain. In reality, the taxable amount of a repurchase is the difference between the buyback price and the shareholder's basis. Since information on investor's shareholdings is confidential, I am unable to determine the basis and sales price of each individual share of stock bought in a repurchase program. For this reason,

the variable RATEDIFF is measured with error. As a result, RATEDIFF is a conservative measure of the tax-rate differential faced by an investor.

To illustrate, if a firm pays out $1 million in dividends, the aggregate tax is calculated as:

Tax on dividend = ordinary rate * $1 million.

Alternatively, if a firm chooses to pay out the $1 million as a repurchase, the aggregate tax is calculated as:

Tax on repurchase = capital gains rate * (1 million – bases of investors' stock).

Therefore, the tax-rate differential an investor faces when contemplating a payout structured as either a repurchase or a dividend should be measured as follows:

Differential Tax = $1 million (ordinary rate – (capital gains tax-rate * R/1+R)),
Implication

where R equals the percentage stock return, less dividends, that the investor has earned during the life of the investment, and (R/1+R) measures the appreciation as a percentage of the firm's current stock price. Hence, the true difference in taxation faced by an investor is greater than the ordinary rate minus the capital gains rate.

In an attempt to consider individual shareholder bases, an alternative measure of RATEDIFF will be used to re-estimate models (1)-(4). It is calculated as follows:

$RATEDIFF2_{it}$ = (ordinary rate – (capital gains tax-rate * R/1+R)),

where R is a one-year, ex-dividend stock return calculated in the year preceding each repurchase observation. A second alternative tax-rate differential, RATEDIFF3, uses a three-year, ex-dividend stock return. While the use of one and three-year time periods is arbitrary, I use them in an attempt to capture the firm-specific appreciation in stock price

and the resulting tax-rate differential faced by both short-term and longer-term investors preceding the date of a repurchase.

6. RESULTS

6.1 Descriptive Statistics

Panels A-D of Table 6 provide descriptive statistics for each variable in the repurchase and dividend payout models. The variable $REPURCH/MVSTOCK, the dollar value of share repurchases as a percentage of the total market value of common stock, ranges from 0% to 29.97% with a mean (median) of 1% (0). The percentage of total corporate payout in the form of repurchases (REPPAY) ranges from 0% to 100% with a mean (median) of 45% (31%). The dependent variable for model 3, specially designated dividends as a percentage of specials and repurchases ($SPECIALS/$SPECIALS + $REPURCHASES), ranges from 0 to 100% with a mean (median) of 0% (0%). The dividend payout ratio (PAY) ranges from 0% to 90% with a mean (median) of 28.73% (28.02%).

6.2 Correlation Coefficients

Panels A-D of Table 7 contain correlation matrices for models 1-4. Panel A reports correlations for the 13,305 observations in the Repurchase/MVStock Model. Several correlations are significant. The size of repurchase programs is positively associated with the tax-rate differential (p=0.0001) and stock option plan size (p=0.04) and negatively associated with the volatility of operating income (p=0.005). Jagannathan et al. (1999), find repurchasing firms have more volatile operating income than dividend-increasing firms. My sample includes any firm that makes a distribution to shareholders through dividends or repurchases, and I find firms with less volatile operating income have larger repurchase programs. However, in Panel B, when repurchases are measured

as a percentage of total payout, a significant positive relation exists between REPPAY and σOPROE. This suggests that firms with less volatile operating income have a smaller percentage of total payout in the form of repurchases. While these correlations may seem conflicting, they are merely descriptive of the sample. Firms with less volatile operating income have larger repurchase programs but repurchases make up a smaller percentage of their total payout. This would coincide with the conventional wisdom that mature firms pay large, consistent dividends and undertake relatively large repurchase programs. Also, in Panel A, several other significant correlations exist between pairs of independent variables. Of note, the tax-rate differential has a significant positive correlation with both CASH and ΔGDP.

In Panel B, the dependent variable REPPAY has a strong positive correlation with RATEDIFF, CASH, σOPROE, and STOCKOP. In addition, there is a strong positive correlation between the three variables CASH, NONOP, and INDAMKBK. The correlation between each pair of these three variables is significant at the 0.0001 level. Also, as expected, stock options are positively associated with the percentage of corporate payout in the form of repurchases (p=0.0001).

In Panel D, for the 1,666 observations in the dividend payout model, there are several significant correlations among the variables. All variables from Rozeff's original dividend payout model are highly correlated with each other. In addition, the tax-rate differential has a significant negative correlation to both a firm's beta and the percentage of the firm held by insiders.

6.3 Repurchase Models

6.3.1 Model (1) – The Level of Repurchase Activity

Results of model (1) are found in Table 8, Panels A-C. The dependent variable for model (1) is the dollar value of share repurchases as a percentage of the total market value of common stock ($REPURCH/MVSTOCK). Panel A presents results of the regression including the tax-rate differential (RATEDIFF), panel B includes the tax-rate differential with the prior year's bases taken into consideration (RATEDIFF2), and panel C incorporates bases over the preceding three years (RATEDIFF3). All p-values in Model (1) are the result of one-tailed, directional tests. In Panel A, the tax-rate differential is significant ($p<0.0001$) and positively associated with the size of repurchase programs. Thus, as capital gains become more tax-favored relative to dividends, corporations increase the size of their share repurchase programs.

When taxpayer bases are factored into the tax-rate differential using 1-year returns, the tax variable is positive and significant ($p=0.001$). Next, Panel C incorporates 3-year returns into the tax-rate differential. Again, the tax variable is a significant predictor of the size of repurchase programs ($p=0.018$). These findings suggest that companies undertake larger repurchase programs as the tax-rate differential increases and when the firm has had small stock price increases over the past 1-year and 3-year time periods.

Contrary to my original expectation, the coefficient on the variable σOPROE is negative. However, as mentioned earlier, this would coincide with the conventional wisdom that less volatile, mature firms undertake relatively larger repurchase programs. Although stock option plan size has a significant positive correlation with the dependent

variable REPURCH (see Table 7, Panel A), a negative relation exists in the presence of the other independent variables. The sign may be changing in the regression as a result of the significant correlation between STOCKOP and either RATEDIFF or σOPROE. All other variables in the model with RATEDIFF are in the predicted direction[19].

Table 9 displays results of a logistic regression with the repurchase decision as the dependent variable. REPURCHASER is an indicator variable that equals 1 in years when a firm repurchases stock and 0 when no repurchases are undertaken. In this regression, the tax-rate differential is positive but not significant (p=0.21). Several of the remaining variables in the logistic regression also exhibit behavior contrary to predictions. The coefficient on the variable STOCKOP, stock option plan size, is negatively related to repurchasing stock. Also, undervaluation and cash are only marginally significant and non-operating income is not significant in this regression.

6.3.2 Model (2) – The Trade-off Between Repurchases and Dividends

Panels A-C of Table 10 contain results of regressions that investigate the impact of the tax-rate differential on the trade-off between repurchases and dividends. All p-values in Model (2) are a result of one-tailed, directional tests. The findings suggest the tax-rate differential has an impact on the method in which management distributes cash. The variable RATEDIFF is positive and highly significant with a t-statistic of 5.86 and a p-value of less than 0.0001. Thus, as the tax-rate differential widens, management increasingly chooses share repurchase programs over dividends. Additionally, the model has a p-value of 0.0001, and the control variables are highly significant. In agreement with current research, both undervaluation (p=0.0002) and stock option plan size (p<0.0001) have a highly significant influence on management's payout decision.

Furthermore, as predicted, the level of cash ($p<0.0001$) and the standard deviation of operating income ($p=0.001$) both exhibit a strong positive association with repurchasing stock. Counter to findings in Jagannathan et al., (1999), I find a significant, negative relation between repurchasing stock and the firms' non-operating incomes.

Panels B and C of Table 10 incorporate 1 and 3-year returns into the tax-rate differential. Both measures are positive, as predicted, but not significant. It appears that either management is only considering statutory tax-rates when evaluating the trade-off between repurchases and dividends or else this proxy is not fully capturing the snapshot that coincides with management's time frame for evaluating shareholder bases.

6.3.3 Model (3) – Repurchases and Specially Designated Dividends

Hypothesis four examines the trade-off between specially designated dividends and share repurchases in response to the tax-rate differential. Table 11 exhibits the results of model (3). RATEDIFF is negative with a t-statistic of –1.58 and a one-tailed p-value of 0.057. Therefore, the tax-rate differential appears to have some impact on the choice between these otherwise similar payout methods. The remaining variables in the model, undervaluation and stock option plan size, do not significantly affect the choice between these two payout methods. Because the dependent variable is often zero or left-censored, a tobit model is also estimated. The results of the tobit model are in Table12. The coefficients are less significant in this model. Furthermore, as shown in Panels B and C of Table 11, the variables RATEDIFF2 and RATEDIFF3 are also not significant.

6.4 Model (4) – Dividend Payout Model

Model (4) tests the prediction that the tax-rate differential has a significant effect on the dividend payout ratio of firms. The results are displayed in Table 13. All p-values

in Model (4) are one-tailed, directional tests. The model is highly significant (p=0.0001) and the tax-rate differential has a negative coefficient, as predicted, with a t-statistic of –2.59 and a p-value of 0.0048. This result is consistent with firms holding dividends per share constant or else growing dividends at a rate slower than the growth rate of earnings as the tax-rate differential increases. When combined with the results of the repurchase regressions, these findings suggest that as the tax-rate differential increases, firms slow their dividend growth rate in favor of tax-advantaged repurchases. The remaining variables are also highly significant ($p<0.01$) and in the predicted direction.

Panels B and C of Table 13 contain the findings of model (4) with RATEDIFF2 and RATEDIFF3 included in the model. RATEDIFF2 is negative and significant with a t-statistic of –2.03 and a p-value of 0.02 when 1-year returns are incorporated into the model. The variable INS, representing the percentage of the firm owned by insiders, is in the predicted direction but is not significant. The other variables remain highly significant, each with a p-value less than 0.0001. RATEDIFF3, which incorporates 3-year returns into the tax-rate differential, is negative but not significant with a p-value of 0.34. Similar to RATEDIFF2, the remaining variables are significant with the exception of the insider variable. Thus, the tax-rate differential and 1-year bases are significantly associated with the dividend payout ratio of firms.

7. CONCLUSIONS

While prior studies mention the difference between ordinary and capital gains tax rates as one possible factor contributing to the growth in share repurchases, the relation between the tax-rate differential and buybacks has not previously been examined. This study finds personal income taxes do affect the corporate payout decision. A positive

relation exists between share repurchases and the tax-rate differential. On average, share repurchase programs are larger and repurchases are a greater percentage of total corporate payout in firm-years when the tax-rate differential is larger. Conversely, in firm-years when the tax-rate differential is smaller, management increases the dividend payout ratio and decreases the percentage of payout in the form of share repurchases. Therefore, the findings suggest management considers statutory personal tax-rates when setting corporate payout.

The variable RATEDIFF understates the tax-rate differential between capital gains and ordinary tax-rates since only the portion of the sales price that is greater than the shareholder's basis is taxed as a capital gain. I attempt to adjust for this understatement by incorporating 1 and 3-year stock returns into the tax-rate differential to separate recovery of the shareholder's capital from the portion that is taxed as a capital gain. The adjusted tax-rate differential has a substantial impact on the size of share repurchase programs. However, shareholder bases do not have a significant impact on the tradeoff between repurchases and dividends. When management contemplates this tradeoff, they appear to only consider statutory tax-rates, or else the proxy I use does not fully capture the snapshot that coincides with management's time frame for evaluating shareholder bases.

I cumulate returns over both the1-year and 3-year period prior to the repurchase observation being considered. Since repurchase programs sometimes span many years, it's unclear whether I'm capturing the beginning of the repurchase program when management would most likely take shareholder bases into consideration. Also, since management has no way of knowing which shareholders will tender their shares in a

repurchase program nor what the tendered shares holding periods will be, they may restrict their decision process to include only statutory tax rates and the presence of an increasing share price for their firm.

While the share repurchase literature has grown rapidly over the past few years, the effect of income taxes has only recently begun to be explored. Future research may choose to investigate whether tax clienteles exist for repurchasing firms. Since mutual fund and individual investors have a tax incentive to prefer repurchases, the percentage of the firm owned by these two investor types should increase for repurchasing firms if taxation motivates the formation of tax-clienteles. An even stronger argument can be made for taxation affecting repurchases if the clientele of a firm prior to a payout affects the type of payout chosen. For example, firms with more individual and mutual fund investors should be more likely to choose a share repurchase program over a dividend initiation or a dividend increase. Finally, future research may choose to expand our knowledge of whether management considers shareholder bases when making payout decisions.

TABLE 1. Tax-Rate Differentials 1982- 1998

PERIOD	MAXIMUM ORDINARY RATE	MAXIMUM CAPITAL GAINS RATE	TAX-RATE DIFFERENTIAL
1982-1986	50%	20%	30%
1987-1989	28%	28%	0%
1990	33%	28%	5%
1991-1992	31%	28%	3%
1993- 05/06/97	39.6%	28%	11.6%
05/07/97-1998	39.6%	20%	19.6%

TABLE 2. Aggregate Payout Statistics ($billions)

YEAR	Aggregate Share Repurchases/Earnings		Aggregate Dividends/earnings
	COMPUSTAT ESTIMATES	SDC DATA	
1982	7.6%		49.0%
1983	6.2%		51.0%
1984	19.0%		46.0%
1985	32.0%		56.0%
1986	44.0%		78.0%
1987		32.0%	51.0%
1988		18.0%	44.0%
1989		29.0%	61.0%
1990		22.0%	63.0%
1991		15.0%	69.0%
1992		19.0%	64.0%
1993		16.0%	59.0%
1994		27.0%	56.0%
1995		32.0%	55.0%
1996		48.0%	57.0%
1997		48.0%	58.0%
1998		56.0%	62.0%

Share Repurchase Sources: Data from 1982-1986 are from Compustat.
Data from 1987-1998 are from the Securities Data Company database.
Dividend and Earnings Source: Board of Governors of the Federal Reserve System

TABLE 3. Variables in Repurchase Models and Hypothesized Signs

Variable	Variable Name	Hypothesized Sign Model (1)	Hypothesized Sign Model (2)
Dollar value of shares repurchased as a % of the market value of stock	**$REPURCH / MV STOCK**	Dep.Variable Model (1)	
Dollar value of shares repurchased as a % of total payout	**$REPURCH / $PAYOUT**		Dep. Variable Model (2)
Tax- rate differential	RATEDIFF	(+)	(+)
Industry adj. market value/book value	INDAMKBK	(-)	(-)
Cash, mkt. sec., & short-term inv.	CASH	(+)	(+)
Standard deviation of operating income	σOPROE	(+)	(+)
Level of non-operating income	NONOP	(+)	(+)
Size of stock option plan	STOCKOP	(+)	(+)
Change in the gross national product	ΔGDP	(+)	

TABLE 4. Variables in Specially Designated Dividend Model and Hypothesized Signs

Variable	Hypothesized Sign	Variable Name	Hypothesis Tested
Dollar value of special dividends as a % of the sum of repurchases and special dividends	**Dep.Variable Model (3)**	**$SPECIALS $SPEC + $REPUR**	
Tax- rate differential	(-)	RATEDIFF	**H4**
Industry adj. market value/book value	(?)	INDAMKBK	
Size of stock option plan	(-)	STOCKOP	

TABLE 5. Variables in Dividend Payout Model and Hypothesized Signs

Variable Definition	Hypothesized Sign	Variable Name	Hypothesis Tested
Dividend payout ratio	**Dep. Variable Model (4)**	**PAY**	
Tax-rate differential	(-)	RATEDIFF	**H2**
Prior 5 yr. avg. growth rate of revenues	(-)	GROW1	
Future 5 yr. avg. growth rate of revenues	(-)	GROW2	
Beta coefficient	(-)	BETA	
% of common stock held by insiders	(-)	INS	
Log of number of common stockholders	(+)	STOCK	

TABLE 6
DESCRIPTIVE STATISTICS

Panel A. Repurchase/MV Stock Model

VARIABLE[a]	n	MEAN	STD DEV	MEDIAN	MINIMUM	MAXIMUM
$REPURCH MVSTOCK	13,305	1.28	3.73	0	0	29.97
RATEDIFF	13,305	10.21	8.02	11.6	0	30
INDAMKBK	13,305	-69.31	27.24	-118.37	-880.27	2275
CASH	13,305	37.55	2.98	15.61	-227.13	184.17
σOPROE	13,305	65.10	5.22	8.62	0	336.20
NONOP	13,305	2.53	2.48	1.43	-245.18	187.28
STOCKOP	13,305	25.33	2.75	7.08	0	161.40
ΔGDP	13,305	359.95	80.76	346.2	183.00	487.60

All variables except ΔGDP are expressed as percentages.

[a]Variable definitions:

$\frac{\$REPURCH_{it}}{MVSTOCK_{it}}$ = actual dollar value of share repurchases by firm i during year t as a percentage of the total MV market value of common stock.

$RATEDIFF_t$ = the difference between capital gains and ordinary income tax rates in effect during year t.

$INDAMKBK_{it-1}$ = the ratio of the average total market value of equity to total book value of equity for firm i's industry, subtracted from the total market value of equity to total book value of equity for firm i, at year t-1.

$CASH_{it-1}$ = the sum of cash, marketable securities, and short-term investments, scaled by market value of equity, all at time t-1.

$\sigma OPROE_{it}$ = the standard deviation of operating income, scaled by market value of equity, for the three years preceding each observation.

$NONOP_{it}$ = non-operating income for firm i, scaled by market value of equity.

$STOCKOP_{it}$ = size of stock option plan, calculated as the number of shares reserved for each firm's stock option plan, scaled by the number of shares outstanding.

ΔGDP_{t-1} = the change in the gross domestic product from year t-1 to year t.

TABLE 6
DESCRIPTIVE STATISTICS

Panel B. Repurchase/Payout Model

VARIABLE[a]	n	MEAN	STD DEV	MEDIAN	MINIMUM	MAXIMUM
$REPURCH	8666	45.23	45.77	31.02	0	100
$PAYOUT						
RATEDIFF	8666	10.06	8.09	11.60	0	30
INDAMKBK	8666	-107.12	10.04	-103.92	-331.93	651.17
CASH	8666	37.33	2.09	15.67	-22.33	160.37
σOPROE	8666	27.45	2.85	5.87	0	145.73
NONOP	8666	4.87	1.11	2.35	-1.67	99.19
STOCKOP	8666	11.56	1.21	5.81	0	73.67

All variables are expressed as percentages.

[a]Variable definitions:

$\$REPURCH_{it}$ = the dollar value of share repurchases in year t, divided by the sum of the dollar value of dividends, $SPAYOUT_{it}$ repurchases, and specially designated dividends.

$RATEDIFF_t$ = the difference between capital gains and ordinary income tax rates in effect during year t.

$INDAMKBK_{it-1}$ = the ratio of the average total market value of equity to total book value of equity for firm i's industry, subtracted from the total market value of equity to total book value of equity for firm i, at year t-1.

$CASH_{it-1}$ = the sum of cash, marketable securities, and short-term investments, scaled by market value of equity, all at time t-1.

$\sigma OPROE_{it}$ = the standard deviation of operating income, scaled by market value of equity, for the three years preceding each observation.

$NONOP_{it}$ = non-operating income for firm i, scaled by market value of equity.

$STOCKOP_{it}$ = size of stock option plan, calculated as the number of shares reserved for each firm's stock option plan, scaled by the number of shares outstanding.

TABLE 6
DESCRIPTIVE STATISTICS

Panel C. Specially Designated Dividends Model

VARIABLE[a]	n	MEAN	STD DEV	MEDIAN	MINIMUM	MAXIMUM
SPECIALS	4394	0	4.67	0	0	100
RATEDIFF	4394	11.60	8.60	11.60	0	30
INDAMKBK	4394	-108.39	5.74	-1.01	-178.15	133.19
STOCKOP	4394	8.67	9.34	5.44	0	201.03

All variables are expressed as percentages.

[a]Variable definitions:

$\frac{\$SPECIALS_{it}}{\$SPEC+\$REPUR_i}$ = the dollar value of specially designated dividends in year t divided by the sum of the dollar value of specially designated dividends and share repurchases.

$RATEDIFF_{ij}$ = the difference between capital gains and ordinary income tax rates in effect during the year of each observation. (H2)

$INDAMKBK_{it-1}$ = the ratio of the average total market value of equity to total book value of equity for firm i's industry, subtracted from the total market value of equity to total book value of equity for firm i, at year t-1.

$STOCKOP_{it}$ = size of stock option plan, calculated as the number of shares reserved for each firm's stock option plan, scaled by the number of shares outstanding.

TABLE 6
DESCRIPTIVE STATISTICS

Panel D. Dividend Payout Model

VARIABLE[a]	n	MEAN	STD DEV	MEDIAN	MINIMUM	MAXIMUM
PAY	1666	28.73	13.96	28.02	0	90.00
GROW1	1666	9.42	13.34	8.50	-37.00	90.50
GROW2	1666	14.25	6.47	13.50	-7.00	95.00
INS	1666	14.81	17.08	7.30	0	95.40
BETA	1666	1.03	0.23	1.00	0	2.20
RATEDIFF	1666	10.25	10.16	11.60	0	30.00
STOCK	1666	8.92	1.40	8.81	3.05	14.77

All variables except STOCK are expressed as percentages.

[a]Variable definitions:

PAY_{it} = the annual dividend payout ratio, computed as dividends/earnings.
$GROW1_{it}$ = the average realized growth rate of revenues for firm i in the five-year's preceding the year being tested.
$GROW2_{it}$ = the forecast of the growth rate of revenues for firm i over the five year's following the year being tested.
INS_{it} = percent of common stock held by the insiders of firm i.
$BETA_{it}$ = firm i's market model beta.
$RATEDIFF_{ij}$ = the difference between capital gains and ordinary income tax rates in effect during the year of each observation. (H2)
$STOCK_{it}$ = the natural logarithm of the number of common stockholders of firm i.

TABLE 7
PEARSON CORRELATION COEFFICIENTS
Prob > | r | under HO: Rho=0
NOBS = 13,305

Panel A. Repurchase/MV Stock Model

Correlation
p-value

	REPURCH	RATEDIFF	INDAMKBK	CASH	σOPROE	NONOP	STOCKOP	ΔGDP
REPURCH	1.00	0.04 0.0001	-0.004 0.62	0.003 0.65	-0.02 0.005	0.001 0.87	0.02 0.04	0.06 0.0001
RATEDIFF		1.00	-0.001 0.85	0.01 0.08	0.0007 0.92	0.003 0.67	-0.02 0.002	0.13 0.0001
INDAMKBK			1.00	0.48 0.0001	0.002 0.77	0.10 0.0001	0.003 0.71	0.003 0.64
CASH				1.00	-0.002 0.79	-0.10 0.0001	0.002 0.75	0.01 0.41
σOPROE					1.00	0.01 0.23	0.02 0.03	0.002 0.79
NONOP						1.00	0.003 0.69	0.01 0.49
STOCKOP							1.00	-0.02 0.01
ΔGDP								1.00

$\underline{\$REPURCH}_{it}$ = actual dollar value of share repurchases by firm i during year t as a percentage of the total MV
$MVSTOCK_{it}$ market value of common stock.
$RATEDIFF_t$ = the difference between capital gains and ordinary income tax rates in effect during year t.
$INDAMKBK_{it-1}$ = the ratio of the average total market value of equity to total book value of equity for firm i's industry, subtracted from the total market value of equity to total book value of equity for firm i, at year t-1.
$CASH_{it-1}$ = the sum of cash, marketable securities, and short-term investments, scaled by market value of equity, all at time t-1.
$\sigma OPROE_{it}$ = the standard deviation of operating income, scaled by market value of equity, for the three years preceding each observation.
$NONOP_{it}$ = non-operating income for firm i, scaled by market value of equity.
$STOCKOP_{it}$ = size of stock option plan, calculated as the number of shares reserved for each firm's stock option plan, scaled by the number of shares outstanding.
ΔGDP_{t-1} = the change in the gross domestic product from year t-1 to year t.

TABLE 7
PEARSON CORRELATION COEFFICIENTS
Prob >| r | under HO: Rho=0
NOBS = 8,666

Panel B. Repurchase/Payout Model

Correlation
p-value

	REPPAY	RATEDIFF	INDAMKBK	CASH	σOPROE	NONOP	STOCKOP
REPPAY	1.00	0.06 .0001	0.01 0.39	0.05 .0001	0.04 0.0008	0.0003 0.98	0.05 .0001
RATEDIFF		1.00	0.01 0.25	0.02 0.10	0.002 0.85	0.0004 0.97	0.00008 0.99
INDAMKBK			1.00	0.66 .0001	-0.02 0.03	0.04 .0001	-0.002 0.84
CASH				1.00	0.02 0.11	0.35 .0001	0.01 0.47
σOPROE					1.00	0.002 0.83	0.001 0.89
NONOP						1.00	0.01 0.55
STOCKOP							1.00

$\underline{\$REPURCH}_{it}$ = the dollar value of share repurchases in year t, divided by the sum of the dollar value of dividends, $\$PAYOUT_{it}$ repurchases, and specially designated dividends.

$RATEDIFF_t$ = the difference between capital gains and ordinary income tax rates in effect during year t.

$INDAMKBK_{it-1}$ = the ratio of the average total market value of equity to total book value of equity for firm i's industry, subtracted from the total market value of equity to total book value of equity for firm i, at year t-1.

$CASH_{it-1}$ = the sum of cash, marketable securities, and short-term investments, scaled by market value of equity, all at time t-1.

$\sigma OPROE_{it}$ = the standard deviation of operating income, scaled by market value of equity, for the three years preceding each observation.

$NONOP_{it}$ = non-operating income for firm i, scaled by market value of equity.

$STOCKOP_{it}$ = size of stock option plan, calculated as the number of shares reserved for each firm's stock option plan, scaled by the number of shares outstanding.

TABLE 7
PEARSON CORRELATION COEFFICIENTS
Prob > | r | under HO: Rho=0
NOBS = 4,394

Panel C. Specially Designated Dividend Model

Correlation
p-value

	SPECIALS	RATEDIFF	INDAMKBK	STOCKOP
SPECIALS	1.00	-0.02 0.11	-0.01 0.71	0.005 0.74
RATEDIFF		1.00	-0.03 0.05	-0.06 <.0001
INDAMKBK			1.00	-0.04 0.003
STOCKOP				1.00

$\frac{\$SPECIALS_{it}}{\$SPEC+\$REPUR_t}$ = the dollar value of specially designated dividends in year t divided by the sum of the dollar value of specially designated dividends and share repurchases.

$RATEDIFF_{ij}$ = the difference between capital gains and ordinary income tax rates in effect during the year of each observation. (H2)

$INDAMKBK_{it-1}$ = the ratio of the average total market value of equity to total book value of equity for firm i's industry, subtracted from the total market value of equity to total book value of equity for firm i, at year t-1.

$STOCKOP_{it}$ = size of stock option plan, calculated as the number of shares reserved for each firm's stock option plan, scaled by the number of shares outstanding.

TABLE 7
PEARSON CORRELATION COEFFICIENTS
Prob > | r | under HO: Rho=0
NOBS = 1,666

Panel D. Dividend Payout Model

Correlation
p-value

	PAY	RATEDIFF	GROW1	GROW2	BETA	INS	STOCK
PAY	1.00	-0.04	-0.29	-0.34	-0.30	-0.18	0.32
		0.10	0.001	0.001	0.001	0.001	0.001
RATEDIFF		1.00	-0.04	0.03	-0.06	-0.06	-0.02
			0.13	0.19	0.01	0.02	0.37
GROW1			1.00	-0.10	0.26	0.06	-0.07
				0.001	0.001	0.02	0.01
GROW2				1.00	0.13	0.09	-0.14
					0.001	0.001	0.001
BETA					1.00	-0.04	0.04
						0.12	0.08
INS						1.00	-0.36
							0.001
STOCK							1.00

PAY_{it} = the annual dividend payout ratio, computed as dividends/earnings.
$RATEDIFF_{ij}$ = the difference between capital gains and ordinary income tax rates in effect during the year of each observation. (H2)
$GROW1_{it}$ = the average realized growth rate of revenues for firm i in the five-year's preceding the year being tested.
$GROW2_{it}$ = the forecast of the growth rate of revenues for firm i over the five year's following the year being tested.
$BETA_{it}$ = firm i's market model beta.
INS_{it} = percent of common stock held by the insiders of firm i.
$STOCK_{it}$ = the natural logarithm of the number of common stockholders of firm i.

TABLE 8
MULTIPLE REGRESSION RESULTS
Repurchase/MV Stock Model

$$\frac{\$REPURCH_{it}}{MVSTOCK_{it}} = \beta_0 + \beta_1 RATEDIFF_t + \beta_2 INDAMKBK_{it-1} + \beta_3 CASH_{it-1} + \beta_4 \sigma OPROE_{it} + \beta_5 NONOP_{it} + \beta_6 STOCKOP_{it} + \beta_7 \Delta GDP_{t-1} + e_{it}$$

Panel A. Ratediff

Variable	expected sign	parameter estimate	t-statistic	p-value
INTERCEPT	(?)	0.00144	1.13	0.2570
RATEDIFF	(+)	0.01396	4.03	<0.0001
INDAMKBK	(-)	-0.00009	-0.81	0.2090
CASH	(+)	0.00007	0.72	0.2358
σOPROE	(+)	-0.00015	-2.79	0.0023
NONOP	(+)	0.00003	0.32	0.3745
STOCKOP	(+)	-0.00018	-1.77	0.0384
ΔGDP	(+)	0.00003	8.10	<0.0001

Model F-Statistic=14.96 (p-value=0.0001)
Adjusted R^2=0.006 NOBS=13,305

Panel B. Ratediff2

Variable	sign	estimate	t-statistic	p-value
INTERCEPT	(?)	-0.00526	-1.91	0.0568
RATEDIFF2	(+)	0.00025	3.09	0.0010
INDAMKBK	(-)	0.00006	0.92	0.1788
CASH	(+)	0.00005	0.13	0.4483
σOPROE	(+)	-0.00144	-2.73	0.0063
NONOP	(+)	0.00012	0.47	0.3192
STOCKOP	(+)	-0.00150	-0.54	0.2946
ΔGDP	(+)	0.00004	5.54	<0.0001

Model F-Statistic=9.95 (p-value=0.0001)
Adjusted R^2=0.01 NOBS=5,086

All variables are one-tailed tests.

$\$REPURCH_{it}$ / $MVSTOCK_{it}$ = actual dollar value of share repurchases by firm i during year t as a percentage of the total MV market value of common stock.

$RATEDIFF_t$ = the difference between capital gains and ordinary income tax rates in effect during year t. (H1)

$INDAMKBK_{it-1}$ = the ratio of the average total market value of equity to total book value of eqity for firm i's industry, subtracted from the total market value of equity to total book value of equity for firm i, at year t-1.

$CASH_{it-1}$ = the sum of cash, marketable securities, and short-term investments, scaled by market value of equity, all at time t-1.

$\sigma OPROE_{it}$ = the standard deviation of operating income, scaled by market value of equity, for the three years preceding each observation.

$NONOP_{it}$ = non-operating income for firm i, scaled by market value of equity.

$STOCKOP_{it}$ = size of stock option plan, calculated as the number of shares reserved for each firm's stock option plan, scaled by the number of shares outstanding.

ΔGDP_{t-1} = the change in the gross domestic product from year t-1 to year t.

TABLE 8
MULTIPLE REGRESSION RESULTS
Repurchase/MV Stock Model

$$\frac{\$REPURCH_{it}}{MVSTOCK_{it}} = \beta_0 + \beta_1 RATEDIFF_t + \beta_2 INDAMKBK_{it-1} + \beta_3 CASH_{it-1} + \beta_4 \sigma OPROE_{it} + \beta_5 NONOP_{it} + \beta_6 STOCKOP_{it} + \beta_7 \Delta GDP_{t-1} + e_{it}$$

Panel C. Ratediff3

Variable	expected sign	parameter estimate	t-statistic	p-value
INTERCEPT	(?)	-0.00489	-1.49	0.1369
RATEDIFF3	(+)	0.00017	2.09	0.0183
INDAMKBK	(-)	0.00006	0.72	0.2358
CASH	(+)	0.00297	2.37	0.0089
σOPROE	(+)	-0.00156	-2.08	0.0188
NONOP	(+)	0.00125	1.79	0.0367
STOCKOP	(+)	-0.00147	-0.55	0.2912
ΔGDP	(+)	0.00005	5.79	<0.0001

Model F-Statistic=7.97 (p-value=0.0001)
Adjusted R^2=0.01 NOBS=3,986

All variables are one-tailed tests.

$\$REPURCH_{it}$ / $MVSTOCK_{it}$ = actual dollar value of share repurchases by firm i during year t as a percentage of the total MV market value of common stock.

$RATEDIFF_t$ = the difference between capital gains and ordinary income tax rates in effect during year t. (H1)

$INDAMKBK_{it-1}$ = the ratio of the average total market value of equity to total book value of equity for firm i's industry, subtracted from the total market value of equity to total book value of equity for firm i, at year t-1.

$CASH_{it-1}$ = the sum of cash, marketable securities, and short-term investments, scaled by market value of equity, all at time t-1.

$\sigma OPROE_{it}$ = the standard deviation of operating income, scaled by market value of equity, for the three years preceding each observation.

$NONOP_{it}$ = non-operating income for firm i, scaled by market value of equity.

$STOCKOP_{it}$ = size of stock option plan, calculated as the number of shares reserved for each firm's stock option plan, scaled by the number of shares outstanding.

ΔGDP_{t-1} = the change in the gross domestic product from year t-1 to year t.

TABLE 9

Logistic Model

Repurchase/MVStock Model

Variable	DF	parameter estimate	standard error	Wald chi-square	pr > chi-square
INTERCPT	1	-1.08	0.08	208.71	0.0001
RATEDIFF	1	0.23	0.18	1.56	0.2120
INDAMKBK	1	-0.00	0.00	2.87	0.0901
CASH	1	0.01	0.01	3.39	0.0655
σOPROE	1	-0.13	0.02	62.09	0.0001
NONOP	1	0.00	0.01	0.64	0.4226
STOCKOP	1	-0.07	0.02	8.31	0.0040
ΔGDP	1	0.00	0.00	13.17	0.0003

NOBS=19,368

REPURCHASER = 1 if a firm repurchased shares of stock during the year, 0 otherwise.

$RATEDIFF_t$ = the difference between capital gains and ordinary income tax rates in effect during year t.

$INDAMKBK_{it-1}$ = the ratio of the average total market value of equity to total book value of equity for firm i's industry, subtracted from the total market value of equity to total book value of equity for firm i, at year t-1.

$CASH_{it-1}$ = the sum of cash, marketable securities, and short-term investments, scaled by market value of equity, all at time t-1.

$\sigma OPROE_{it}$ = the standard deviation of operating income, scaled by market value of equity, for the three years preceding each observation.

$NONOP_{it}$ = non-operating income for firm i, scaled by market value of equity.

$STOCKOP_{it}$ = size of stock option plan, calculated as the number of shares reserved for each firm's stock option plan, scaled by the number of shares outstanding.

ΔGDP_{t-1} = the change in the gross domestic product from year t-1 to year t.

TABLE 10
MULTIPLE REGRESSION RESULTS
Repurchase/Payout Model

$$\frac{REPURCH_{it}}{\$PAYOUT_{it}} = \gamma_0 + \gamma_1 RATEDIFF_t + \gamma_2 INDAMKBK_{it-1} + \gamma_3 CASH_{it-1} + \gamma_4\ \sigma OPROE_{it} + \gamma_5 NONOP_{it} + \gamma_6 STOCKOP_{it} + e_{it}$$

Panel A. Ratediff

Variable	expected sign	parameter estimate	t-statistic	p-value
INTERCEPT	(?)	0.405	53.27	<0.0001
RATEDIFF	(+)	0.323	5.86	<0.0001
INDAMKBK	(-)	- 0.002	-3.64	0.0002
CASH	(+)	0.021	6.20	<0.0001
σOPROE	(+)	0.005	3.10	0.0010
NONOP	(+)	- 0.013	-2.72	0.0034
STOCKOP	(+)	0.017	4.40	0.0001

Model F-Statistic=17.70 (p-value=0.0001)
Adjusted R^2=0.01 NOBS=8,666

Panel B. Ratediff2

Variable	expected sign	parameter estimate	t-statistic	p-value
INTERCEPT	(?)	0.3510	44.42	< 0.0001
RATEDIFF2	(+)	0.000008	0.28	0.3897
INDAMKBK	(-)	-0.0028	-1.96	0.0250
CASH	(+)	0.0765	6.31	< 0.0001
σOPROE	(+)	0.0361	4.69	< 0.0001
NONOP	(+)	0.0115	0.69	0.2451
STOCKOP	(+)	0.0731	3.31	0.0005

Model F-Statistic=13.12 (p-value=0.0001)
Adjusted R^2=0.02 NOBS=4,327

All variables are one-tailed tests.

$\frac{REPURCH_{it}}{\$PAYOUT_{it}}$ = the dollar value of share repurchases in year t, divided by the sum of the dollar value of dividends, repurchases, and specially designated dividends.

$RATEDIFF_t$ = the difference between capital gains and ordinary income tax rates in effect during year t. (H2)

$INDAMKBK_{it-1}$ = the ratio of the average total market value of equity to total book value of equity for firm i's industry, subtracted from the total market value of equity to total book value of equity for firm i, at year t-1.

$CASH_{it-1}$ = the sum of cash, marketable securities, and short-term investments, scaled by market value of equity, all at time t-1.

$\sigma OPROE_{it}$ = the standard deviation of operating income, scaled by market value of equity, for the three years preceding each observation.

$NONOP_{it}$ = non-operating income for firm i, scaled by market value of equity.

$STOCKOP_{it}$ = size of stock option plan, calculated as the number of shares reserved for each firm's stock option plan, scaled by the number of shares outstanding.

TABLE 10
MULTIPLE REGRESSION RESULTS
Repurchase/Payout Model

$$\frac{REPURCH_{it}}{\$PAYOUT_{it}} = \gamma_0 + \gamma_1 RATEDIFF_t + \gamma_2 INDAMKBK_{it-1} + \gamma_3 CASH_{it-1} + \gamma_4\, \sigma OPROE_{it} + \gamma_5 NONOP_{it} + \gamma_6 STOCKOP_{it} + e_{it}$$

Panel C. Ratediff3

Variable	expected sign	parameter estimate	t-statistic	p-value
INTERCEPT	(?)	0.4419	80.79	<0.0001
RATEDIFF3	(+)	0.0000	0.96	0.1685
INDAMKBK	(-)	-0.0023	-3.35	0.0005
CASH	(+)	0.0200	5.80	<0.0001
σOPROE	(+)	0.0051	2.78	0.0028
NONOP	(+)	-0.0128	-2.68	0.0036
STOCKOP	(+)	0.0222	4.24	<0.0001

Model F-Statistic=10.59 (p-value=0.0001)
Adjusted R^2=0.01 NOBS=2,468

All variables are one-tailed tests.

$\frac{\$REPURCH_{it}}{\$PAYOUT_{it}}$ = the dollar value of share repurchases in year t, divided by the sum of the dollar value of dividends, repurchases, and specially designated dividends.

$RATEDIFF_t$ = the difference between capital gains and ordinary income tax rates in effect during year t. (H2)

$INDAMKBK_{it-1}$ = the ratio of the average total market value of equity to total book value of equity for firm i's industry, subtracted from the total market value of equity to total book value of equity for firm i, at year t-1.

$CASH_{it-1}$ = the sum of cash, marketable securities, and short-term investments, scaled by market value of equity, all at time t-1.

$\sigma OPROE_{it}$ = the standard deviation of operating income, scaled by market value of equity, for the three years preceding each observation.

$NONOP_{it}$ = non-operating income for firm i, scaled by market value of equity.

$STOCKOP_{it}$ = size of stock option plan, calculated as the number of shares reserved for each firm's stock option plan, scaled by the number of shares outstanding.

TABLE 11
MULTIPLE REGRESSION RESULTS
Specially Designated Dividend Model

$$\frac{\$SPECIALS_{it}}{\$SPECIALS+\$REPUR_{it}} = \gamma_0 + \gamma_1 RATEDIFF_t + \gamma_2 INDABKMK_{it-1} + \gamma_3 STOCKOP_{it} + e_{it}$$

Panel A. Ratediff

Variable	expected sign	parameter estimate	t-statistic	p-value
INTERCEPT	(?)	0.0026	2.49	0.0129
RATEDIFF	(-)	-0.0086	-1.58	0.0571
INDAMKBK	(?)	-0.00004	-0.41	0.6837
STOCKOP	(-)	0.0014	0.22	0.4129

Model F-Statistic=0.91 (p-value=0.4335)
Adjusted R^2=0.00 NOBS=4,394

Panel B. Ratediff2

Variable	expected sign	parameter estimate	t-statistic	p-value
INTERCEPT	(?)	0.0069	2.73	0.0063
RATEDIFF2	(-)	-0.0130	-0.46	0.3228
INDAMKBK	(?)	0.0014	4.96	0.0001
STOCKOP	(-)	0.0275	1.88	0.0301

Model F-Statistic=9.04 (p-value=0.0001)
Adjusted R^2=0.01 NOBS=3,265

All inferences for the variables RATEDIFF, RATEDIF2, and STOCKOP are the result of one-tailed tests.

$\frac{\$SPECIALS_{it}}{\$SPEC+\$REPUR_i}$ = the dollar value of specially designated dividends in year t divided by the sum of the dollar value of specially designated dividends and share repurchases.

$RATEDIFF_{ij}$ = the difference between capital gains and ordinary income tax rates in effect during the year of each observation. (H3)

$INDAMKBK_{it-1}$ = the ratio of the average total market value of equity to total book value of equity for firm i's industry, subtracted from the total market value of equity to total book value of equity for firm i, at year t-1.

$STOCKOP_{it}$ = size of stock option plan, calculated as the number of shares reserved for each firm's stock option plan, scaled by the number of shares outstanding.

TABLE 11
MULTIPLE REGRESSION RESULTS
Specially Designated Dividend Model

$$\frac{\$SPECIALS_{it}}{\$SPECIALS+\$REPUR_{it}} = \gamma_0 + \gamma_1 RATEDIFF_t + \gamma_2 INDABKMK_{it-1} + \gamma_3 STOCKOP_{it} + e_{it}$$

Panel C. Ratediff3

Variable	expected sign	parameter estimate	t-statistic	p-value
INTERCEPT	(?)	0.00003	1.61	0.1064
RATEDIFF3	(-)	-0.000002	-0.05	0.4801
INDAMKBK	(?)	-0.000009	-0.09	0.9265
STOCKOP	(-)	-0.00007	-0.09	0.4641

Model F-Statistic=0.01 (p-value=0.99)
Adjusted R^2=0.00 NOBS=2,393

All inferences for the variables RATEDIFF3 and STOCKOP are one-tailed tests. INDAMKBK is two-tailed.

$\frac{\$SPECIALS_{it}}{\$SPEC+\$REPUR_t}$ = the dollar value of specially designated dividends in year t divided by the sum of the dollar value of specially designated dividends and share repurchases.

$RATEDIFF3_{ij}$ = the difference between capital gains and ordinary income tax rates in effect during the year of each observation. (H3)

$INDAMKBK_{it-1}$ = the ratio of the average total market value of equity to total book value of equity for firm i's industry, subtracted from the total market value of equity to total book value of equity for firm i, at year t-1.

$STOCKOP_{it}$ = size of stock option plan, calculated as the number of shares reserved for each firm's stock option plan, scaled by the number of shares outstanding.

TABLE 12

Tobit Model

Specially Designated Dividend Model

Variable	DF	estimate	chisquare	pr>chi
INTERCPT	1	-5.68	35.77	0.0001
RATEDIFF	1	-1.19	0.14	0.7074
INDABKMK	1	0.03	5.93	0.0149
STOCKOP	1	2.00	2.01	0.1561
SCALE	1	2.34		

NOBS=4,265

$RATEDIFF_t$ = the difference between capital gains and ordinary income tax rates in effect during year t. (H3)

$INDAMKBK_{it-1}$ = the ratio of the average total market value of equity to total book value of equity for firm i's industry, subtracted from the total market value of equity to total book value of equity for firm i, at year t-1.

$STOCKOP_{it}$ = size of stock option plan, calculated as the number of shares reserved for each firm's stock option plan, scaled by the number of shares outstanding.

TABLE 13
MULTIPLE REGRESSION RESULTS
Dividend Payout Model

$PAY_{it} = \phi_0 + \phi_1 RATEDIFF_{it} + \phi_2 GROW1_{it} + \phi_3 GROW2_{it} + \phi_4 BETA_{it} + \phi_5 INS_{it} + \phi_6 STOCK_{it} + e_{it}$

Panel A. Ratediff

Variable	expected sign	parameter estimate	t-statistic	p-value
INTERCEPT	(?)	32.99	13.17	0.0001
RATEDIFF	(-)	-0.07	- 2.59	0.0048
GROW1	(-)	-0.26	-11.67	<0.0001
GROW2	(-)	-0.63	-13.96	<0.0001
BETA	(-)	-13.04	-10.19	<0.0001
INS	(-)	-0.05	- 2.91	0.0019
STOCK	(+)	2.47	11.36	<0.0001

Model F-Statistic=135.73 (p-value=0.0001)
Adjusted R^2=0.33 NOBS=1,666

Panel B. Ratediff2

Variable	expected sign	parameter estimate	t-statistic	p-value
INTERCEPT	(?)	36.26	8.61	0.0001
RATEDIFF2	(-)	-0.14	- 2.03	0.0212
GROW1	(-)	-0.35	- 9.84	<0.0001
GROW2	(-)	-0.78	-10.21	<0.0001
BETA	(-)	-12.28	- 6.45	<0.0001
INS	(-)	-0.02	- 0.90	0.1841
STOCK	(+)	2.71	8.49	<0.0001

Model F-Statistic=70.78 (p-value=0.0001)
Adjusted R^2=0.39 NOBS=671

All variables are one-tailed tests.

PAY_{it} = the annual dividend payout ratio, computed as dividends/earnings.
$RATEDIFF_{ij}$ = the difference between capital gains and ordinary income tax rates in effect during the year of each observation. (H4)
$GROW1_{it}$ = the average realized growth rate of revenues for firm i in the five-year's preceding the year being tested.
$GROW2_{it}$ = the forecast of the growth rate of revenues for firm i over the five year's following the year being tested.
$BETA_{it}$ = firm i's market model beta.
INS_{it} = percent of common stock held by the insiders of firm i.
$STOCK_{it}$ = the natural logarithm of the number of common stockholders of firm i.

TABLE 13
MULTIPLE REGRESSION RESULTS
Dividend Payout Model

$PAY_{it} = \phi_0 + \phi_1 RATEDIFF_{it} + \phi_2 GROW1_{it} + \phi_3 GROW2_{it} + \phi_4 BETA_{it} + \phi_5 INS_{it} + \phi_6 STOCK_{it} + e_{it}$

Panel C. Ratediff3

Variable	expected sign	parameter estimate	t-statistic	p-value
INTERCEPT	(?)	58.87	3.66	0.0008
RATEDIFF3	(+)	-7.55	-0.41	0.3409
GROW1	(-)	-0.65	-4.01	<0.0001
GROW2	(-)	-1.06	-3.35	0.0004
BETA	(-)	-25.49	-3.25	0.0006
INS	(-)	-0.06	-0.54	0.2946
STOCK	(+)	2.27	1.85	0.0322

Model F-Statistic=8.02 (p-value=0.0001)
Adjusted R^2=0.58 NOBS=42

All variables are one-tailed tests.

PAY_{it} = the annual dividend payout ratio, computed as dividends/earnings.
$RATEDIFF_{ij}$ = the difference between capital gains and ordinary income tax rates in effect during the year of each observation. (H4)
$GROW1_{it}$ = the average realized growth rate of revenues for firm i in the five-year's preceding the year being tested.
$GROW2_{it}$ = the forecast of the growth rate of revenues for firm i over the five year's following the year being tested.
$BETA_{it}$ = firm i's market model beta.
INS_{it} = percent of common stock held by the insiders of firm i.
$STOCK_{it}$ = the natural logarithm of the number of common stockholders of firm i.

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9. ENDNOTES

[1] In this study, dividends refer to cash dividends. Share repurchases occur when a corporation buys back stock from its shareholders, thereby reducing the number of shares of common stock outstanding.
[2] TRA '86 lowered the highest marginal ordinary tax-rate for individuals to 28%, while the capital gains rate was raised to 28%.
[3] This large differential is the result of the 1997 Act which lowered capital gains tax-rates for individuals to 20% on investments, such as stocks, while the highest tax-rate on personal ordinary income is 39.6%.
[4] For example, Ikenberry and Vermaelen (1996) note that open-market stock buybacks have been argued to be a tax-efficient way in which firms can distribute wealth in comparison to cash dividends. Bagwell and Shoven (1989), Dunsby (1995), and Poterba (1987) mention that a possible reason for the increase in repurchase activity is managers learning that repurchases dominate dividends from a tax standpoint.
[5] Section 302 of the Internal Revenue Code states that share repurchases will not qualify for preferential capital gains treatment but will instead be treated as a dividend unless either the redemption of shares is "substantially disproportionate" and the shareholder owns less than 50% of the total voting power after the redemption or the distribution is "essentially not equivalent" to paying a dividend. A redemption is "substantially disproportionate" if, after the repurchase, the percentage ownership of the tendering shareholder is less than 80% of the ownership position before the repurchase. These two provisions, in effect, rule out preferential capital gains treatment for pro-rata repurchases. While the Internal Revenue Service has the authority to declare regular repurchases equivalent to dividend payments, thus eliminating any tax advantage, such a ruling is almost never imposed on a large public corporation. If the I.R.S. were to reclassify a repurchase as a dividend, ordinary tax rates instead of capital gains rates would be imposed on the entire distribution.
[6] Cash tender offers are generally made to investors by the firm at an above-market price. Tender offer repurchases, unlike open market repurchases, are regulated by the Securities and Exchange Commission. Specifically, tender offer repurchases must comply with the anti-manipulation and anti-fraud provisions of the Securities and Exchange Act of 1934, as amended. With a cash tender offer, the firm usually advertises in the Wall Street Journal their willingness to purchase a given number of shares for a specified price during a set time period. Investors who choose to sell their shares receive a premium price, and pay capital gains taxes rather than ordinary income taxes on the realized gain.
[7] In a dutch-auction repurchase a range of prices is stipulated by the corporation, within which, each tendering shareholder chooses their minimum acceptable selling price. The repurchasing firm then orders the offers by the shareholders' minimum acceptable price. Next, the firm determines the minimum price that will garner the pre-specified number of shares the firm is seeking to repurchase. This price is then paid to all shareholders that tender shares at an ask-price equal to, or lower than, this endogenously determined price. Typically, the minimum price set by the firm is only slightly higher than the market price, while the maximum price represents a premium similar to tender-offer repurchases.
[8] Although they are infrequent, a privately negotiated repurchase entails buying back shares of stock from a shareholder, (usually a shareholder with a large holding) through direct negotiation with the firm. Either the firm or the shareholder may initiate the repurchase negotiations.
[9] Four criteria must be followed to receive protection under S.E.C. Rule 10b-18. These four criteria are: (1) Firms may not purchase, on any one day, more than twenty-five percent of the average daily volume of their own shares during the prior four weeks, however, block trades and privately negotiated transactions are exempt from this guideline; (2) firms may not purchase their own shares during the opening or last one-half hour of trading; (3) firms may not purchase their own shares at a price higher than the last independent bid, or the last reported sales price; and (4) all purchases on a single day must be executed through the same brokerage firm.
[10] Jensen defines free cash flow as cash flow in excess of that required to fund all projects that have positive net present values when discounted at the relevant cost of capital.
[11] As a result of Kerkorian's demands, Chrysler raised dividends by 60% from $.25/share to $.40/share. Although Chrysler announced a $1 billion repurchase plan, they ultimately repurchased $139 million of stock.
[12] Assuming semi-strong efficiency of the capital market, management can possess inside information about the future prospects of the firm. Share repurchases may provide a credible means for management to

convey this information to investors.

[13] The term pro-cyclical, as used in Jagannathan et al.'s paper, refers to the high correlation between the aggregate amount of repurchases and aggregate earnings over their ten year study.

[14] Nonregulated firms exclude utilities.

[15] Banks and credit institutions tend to have different capital structures from other firms.

[16] Consistent with prior studies, the variables INDAMKBK, CASH, and STOCKOP are consistently significant when all repurchases are included in the sample. However, when large repurchases are deleted, the significance level of these variables becomes less consistent.

[17] The conclusions remain the same if 1983 and 1984 are included in the sample.

[18] Dividends with a CRSP distribution code of either 1262 or 1272 labeled as either 'extra or special' or 'year-end' are considered to be specially designated dividends.

[19] If repurchases greater than 30% of the market value of equity are not deleted, all control variables are in the predicted direction and significant at conventional levels. All predictions for the control variables are based on prior research which does not delete large repurchases. However, large repurchases of up to 100% of a firm's stock are most likely not motivated by the control variables in my model, but rather for capital structure changes.