

The Effect of Shareholder Taxes on Corporate Payout Choice

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Abstract

This study investigates whether the difference in individual shareholder tax rates between dividend income and capital gain (the dividend tax penalty) affects a firm's choice between distributing funds to shareholders through dividends or share repurchases. The results of this study suggest that, in periods in which the dividend tax penalty increases, firms are more likely to distribute funds to shareholders through share repurchases as opposed to dividends. The results also indicate that the relation between the dividend tax penalty and corporate payout choice is affected by the types of shareholders who own stock in the firm. As tax-disfavored institutional ownership increases and the dividend tax penalty increases, firms are more likely to repurchase shares as opposed to distributing dividends. In contrast, as tax-favored institutional ownership increases and the dividend tax penalty increases, firms are less likely to repurchase shares as opposed to distributing dividends. As senior managerial share ownership increases and the dividend tax penalty increases, firms are more likely to make distributions to shareholders in the form of share repurchases.

I. Introduction

In 2002, domestic public firms distributed \$357 billion to shareholders through dividends and \$212 billion in the form of stock repurchases.¹ These substantial distributions occurred at a time when the maximum individual tax rate on dividends at 38.6% was significantly higher than the maximum individual tax rate on capital gains at 20%. Despite the relative tax advantage of capital gains, firms continued to distribute a significant portion of their excess cash through dividends, creating what Black (1976) termed the “dividend tax puzzle.” The existing literature in corporate finance establishes that firms consider a variety of factors when deciding to distribute funds to shareholders in the form of share repurchases

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¹For the 2002 fiscal year on Compustat, 8,687 domestic firms reported distributing dividends and 7,427 domestic firms reported repurchasing shares.

or dividends. Typically, firms repurchase shares to signal undervaluation, to fund exercised employee stock options, or to distribute significant but non-sustainable excess cash. In contrast, firms are more likely to distribute dividends to shareholders to signal that the firm anticipates sustainable higher future earnings.

On May 28, 2003, President George W. Bush signed the 2003 Jobs and Growth Tax Relief Reconciliation Act (JGTRRA) reducing the individual dividend tax rate from 38.6% to 15% and the capital gains tax rate from 20% to 15%. According to U.S. House of Representatives Committee Report 108-94, the purpose for the reduction in the dividend tax rate was to lower corporate cost of capital and to motivate corporations to increase dividend distributions to shareholders. Evidence from the business press supports the House Committee Report and suggests that shareholders exert influence over firms regarding corporate payout policy based on shareholder tax rates.² However, there is not uniform acceptance of the view that shareholder taxes affect corporate payout choice. In a survey of 384 financial executives, Brav, Graham, Harvey, and Michaely (2004) find that more than two-thirds of the respondents indicate that a reduction in dividend tax rates would not affect their dividend distribution decisions. The main reason given is that increases in regular dividends indicate a relatively permanent commitment to distribute future cash flows, while changes in tax rates on dividends are generally temporary.³ Despite the quantity of academic research, comments from the business press, and survey evidence, the influence of shareholder taxes over multiple tax regimes on a firm's choice between distributing funds to shareholders through share repurchases or dividends remains essentially unexplained in the accounting and finance literature.

This study investigates whether the dividend tax penalty, defined as the difference between individual shareholder tax rates on dividend income and long-term capital gains, influences firms' use of share repurchases versus dividends. Further, this study investigates whether firms' ownership structures (e.g., the percent of ownership by senior management, junior management, tax-favored institutional shareholders, or tax-disfavored institutional investors) influences the extent to which companies consider shareholder-level taxes in their payout decisions. Finally, this study looks at whether the change in a firm's stock price over the prior year, in conjunction with different groups of shareholders, affects corporate payout policy.

I examine firms' payout choices over a period with multiple tax regime changes, 1986 to 2004. I first compare firms that repurchase shares with firms that issue special dividends. Since neither share repurchases nor special dividends commit the firm to future distributions, this setting allows inferences re-

²A 1987 *Wall Street Journal* article reported that for tax purposes Allegis Corporation's largest shareholder (Coniston Partners) was pushing for a previously announced payout to shareholders to take the form of a partial stock buy-back instead of a special dividend. More recently, in 2003 *The Wall Street Journal* reported that Citigroup, citing the 2003 Tax Act, decided to increase its dividend by 43% while substantially reducing its share repurchase program. In the same *Wall Street Journal* article, Procter & Gamble Co., Goldman Sachs Group Inc., Walgreen Co., World Wrestling Entertainment Inc., and Microsoft all said they would initiate or significantly increase dividends in direct response to the 2003 Tax Act.

³Blouin, Raedy, and Shackelford (2004) enumerates several reasons why the significant decrease in the dividend tax rate after the 2003 Tax Act may not have influenced a firm to increase its dividend distributions.

garding corporate payout policy behavior across tax regimes for a one-time distribution to shareholders. Because special dividends are relatively rare, I also compare firms that repurchase shares with firms that increase their regular per-share dividends. Increases in regular dividends have longer term consequences by committing the firm to higher future payouts. Thus, this setting provides evidence regarding whether changes in the dividend tax penalty influence firms' use of share repurchases versus increases in regular dividends with ongoing commitments.

The results provide evidence that shareholder taxes influence firms' choice of distribution methods. After controlling for other explanations of firms' payout choices, I find that firms are more likely to distribute funds to shareholders through share repurchases rather than as special dividends or regular dividend increases as the dividend tax penalty increases. For the share repurchase versus special dividend setting, the results indicate that a one standard deviation increase in the dividend tax penalty from approximately 12.5% to 21% increases the probability of a share repurchase by the "mean firm" from 98.17% to 98.84%. For the share repurchase versus regular dividend increase setting, the results indicate that a one standard deviation increase in the dividend tax penalty from approximately 12.0% to 20.5% increases the probability of a share repurchase by the mean firm from 83.16% to 86.11%. These findings imply that the dividend tax penalty on individual shareholders influences corporate payout choice.

I examine this result further by considering whether the relation between the dividend tax penalty and corporate payout choice is affected by the types of shareholders who own stock in the firm. Based on the categories of institutional shareholders provided by Thompson Financial, I subdivide the institutional ownership category into institutional shareholders that are most likely to be tax advantaged with respect to dividends (i.e., banks and other institutional shareholders) and institutional shareholders that are most likely to be tax disadvantaged with respect to dividends (i.e., mutual funds, investment advisors (brokers), and insurance companies). Consistent with a tax incentive effect, the results show that as the dividend tax penalty increases, firms with higher levels of ownership by tax disadvantaged institutional shareholders are more likely to repurchase shares. In contrast, as the dividend tax penalty increases, firms with higher levels of ownership by dividend tax-favored institutional shareholders are less likely to repurchase shares.

Another identifiable group of shareholders consists of firm management. I investigate whether different levels of managerial ownership affect corporate payout policy as the dividend tax penalty changes. Senior managers, defined by Thompson Financial as level 1 insider shareholders,⁴ who own stock in their companies are likely subject to the maximum dividend tax penalty and are likely to have sufficient power within their firms to influence corporate payout policy. In the share repurchase versus increase in regular dividend setting, the results suggest that as the dividend tax penalty increases, firms with higher percentages of

⁴Thompson Financial defines level 1 insider shareholders as the firm's chairman of the board, chief executive officer, chief operating officer, general counsel, or president. See the Insider Filing Data Feed available from Thompson Financial on WRDS for the classification system of levels 1, 2, 3, and 4 managerial shareholders.

level 1 insider ownership are more likely to repurchase shares. The results also suggest that as other insider ownership, including lower level managerial ownership increases and the dividend tax penalty increases, firms are more likely to increase dividends as opposed to distributing funds to shareholders through share repurchases.

The results support the notion that a firm's stock price appreciation affects its corporate payout policy. Specifically, firms that experience higher price appreciation in the previous year are more likely to distribute funds to shareholders through dividends. As a firm's average stock price appreciates and ownership by banks and other institutional shareholders increases, firms are more likely to distribute funds to shareholders through share repurchases. In contrast, as a firm's stock price goes up and ownership by tax-disfavored institutional shareholders increases, firms are more likely to distribute funds to shareholders through dividends.

This study contributes to the existing literature by providing supplemental confirming evidence that firms' payout choices are sensitive to the dividend tax penalty that exists over multiple tax regimes. Next, this paper provides evidence that suggests that the relation between the dividend tax penalty and corporate payout choice is affected by the types of shareholders who own stock in the firm. Finally, I show that stock price appreciation with different groups of shareholders affects corporate payout policy under different tax regimes.

The remainder of this paper proceeds as follows. Section II provides background information on firms' choices of alternative payout methods. Section III develops the research hypotheses. Section IV discusses the sample selection procedures and data. Section V presents the empirical model and Section VI summarizes the empirical results. Section VII concludes and provides suggestions for future research.

II. Corporate Payout Choice

Firms' payout methods to shareholders may include stock repurchases, special dividends, or regular dividends. The two most common methods firms use to repurchase their own stock include single-price tender offer repurchases and open market repurchase programs.⁵ Shareholders participating in either a tender offer stock repurchase or an open market stock repurchase recognize a capital gain to the extent the sales price exceeds the original purchase price or other tax basis. If an individual shareholder owns the stock for a certain period of time, generally at least 12 months, then the shareholder pays taxes on the capital gain at the long-term capital gain tax rate.

Instead of repurchasing shares, firms may distribute funds to shareholders through special dividends or regular dividends. Regular dividends are dividend distributions that firms make to shareholders on a recurring annual, semiannual, or quarterly basis. In contrast, special dividends are usually one-time dividend

⁵According to Jagannathan, Stephens, and Weisbach (2000), single-price tender offers and open market repurchase programs accounted for 87% of all share repurchase programs from 1985 to 1996. The remaining 13% of share repurchases originated under privately negotiated repurchase programs (9%) and Dutch auction repurchase programs (4%).

distributions firms make to shareholders. Shareholders are required to pay taxes on the receipt of both types of dividends at the prevailing dividend tax rate. Typically, individual shareholders pay a higher tax rate on dividend income than on long-term capital gains.

III. Hypothesis Development

A. Shareholder Taxes and Payout Choice

Table 1 summarizes the maximum individual tax rates on dividend income, long-term capital gains, and the dividend tax penalty for the period 1986 to 2004. *Ceteris paribus*, if firms take the dividend tax penalty into consideration in their payout choices, then firms should be more likely to make dividend distributions to shareholders when the dividend tax penalty is relatively lower (1988–1992 and 2003–2004) and more likely to repurchase shares when the dividend tax penalty is relatively higher (1984–1987 and 1993–2002). As a result, the first hypothesis follows.

Hypothesis 1A. As the dividend tax penalty increases, firms are more likely to make distributions to shareholders through stock repurchases as opposed to issuing special dividends.

Hypothesis 1B. As the dividend tax penalty increases, firms are more likely to make distributions to shareholders through stock repurchases as opposed to increasing regular dividend payments.

TABLE 1
Summary of Tax Rates for Individual Investors on Dividend Income versus Long-Term Capital Gains by Year

Column 2 represents the highest marginal tax rate on dividend income for individual taxpayers during the applicable year and column 3 represents the highest marginal tax rate on long-term capital gains for individual taxpayers during the applicable year. The dividend tax penalty (column 4) is defined as the difference between the highest marginal tax rate on dividend income and the highest marginal tax rate on long-term capital gains income divided by one minus the highest marginal tax rate on long-term capital gains.

Year	Individual Dividend Tax Rate (t_d)	Individual Long-Term Capital Gains Tax Rate (t_{cg})	Dividend Tax Penalty $(t_d - t_{cg}) / (1 - t_{cg})$
1986	50.00%	20.00%	0.375
1987	38.50%	28.00%	0.146
1988	28.00%	28.00%	0.000
1989	28.00%	28.00%	0.000
1990	28.00%	28.00%	0.000
1991	31.00%	28.00%	0.042
1992	31.00%	28.00%	0.042
1993	39.60%	28.00%	0.161
1994	39.60%	28.00%	0.161
1995	39.60%	28.00%	0.161
1996	39.60%	28.00%	0.161
1997	39.60%	20.00%	0.245
1998	39.60%	20.00%	0.245
1999	39.60%	20.00%	0.245
2000	39.60%	20.00%	0.245
2001	39.10%	20.00%	0.239
2002	38.60%	20.00%	0.233
2003	15.00%	15.00%	0.000
2004	15.00%	15.00%	0.000

To my knowledge, Lie and Lie (1999) is the only paper to date that considers the relation between shareholder taxes and corporate payout choice over multiple tax regimes. They find that firms with low dividend yields (as a proxy for high marginal tax rate shareholders) tend to distribute funds to investors through stock repurchases rather than as dividends. They also find that the choice between dividend distributions and share repurchases depends on whether the distribution occurred before the 1986 Tax Act, the stock price appreciation in the previous year, and the interaction of dividend yield and stock price appreciation. This study builds upon the initial results obtained by Lie and Lie (1999). After controlling for a firm's dividend yield and stock price appreciation, I find that changes in the dividend tax penalty affect corporate payout policy. This paper further extends Lie and Lie's (1999) original analysis by considering the effect of different types of investors on the relation between corporate payout policy and the dividend tax penalty.

B. Ownership Structure

Some institutional shareholders should have a lower tax rate on dividends as compared to individual shareholders. Institutional shareholders such as charitable endowments, universities, and pension funds are tax exempt while other institutions such as banks and other corporations receive the benefit of a dividends received deduction.⁶ In contrast, institutional shareholders classified as mutual funds, investment advisors (brokers), or insurance companies may have underlying shareholders who are subject to the maximum dividend tax penalty. Based on this observation, Strickland (2002) classifies mutual funds and investment advisors (brokers) as potentially taxable institutional investors and other institutional shareholders such as pension funds, universities, and charitable foundations as tax-exempt institutional investors. Using these classifications, Strickland finds that taxable institutions have a low preference for dividends, while tax-exempt institutions do not exhibit a preference for either low or high dividend paying stocks.

Based on the classification methodology created by Strickland (2002) and supplemented by Grinstein and Michaely (2005), I divide aggregate institutional ownership into two categories. The first category, defined as banks and other institutional shareholders, consists of shares held by banks, pension funds, charitable endowments, universities, and other corporations. Shareholders in this group are either tax-exempt shareholders or are tax favored with respect to dividends due to the dividends received deduction. Since these shareholders are the least affected by the dividend tax penalty, I predict that institutional shareholders in this category will be the least likely to persuade firms to increase share repurchases after

⁶Corporations that receive dividends from other taxable domestic corporations are entitled to the dividends received deduction. If the recipient corporation owns less than 20% of the stock of the paying corporation, then the recipient corporation gets to deduct 70% of the dividend received. If the recipient corporation owns at least 20% but less than 80% of the stock of the paying corporation, then the recipient corporation gets to deduct 80% of the dividend received. If the recipient corporation owns 80% or more of the stock of the paying corporation, then the recipient corporation gets to deduct 100% of the dividend received.

the dividend tax penalty increases. This observation leads to Hypothesis 2A and B.

Hypothesis 2A. Firms with higher institutional ownership from banks and other institutional shareholders are more likely to make distributions to shareholders through special dividends as opposed to share repurchases even as the dividend tax penalty increases.

Hypothesis 2B. Firms with higher institutional ownership from banks and other institutional shareholders are more likely to make distributions to shareholders through increases in regular dividends as opposed to share repurchases even as the dividend tax penalty increases.

The second category of institutional shareholders, defined as mutual funds, brokers, and insurance, consists of shares owned by mutual funds, independent investment advisors (brokers), and insurance companies. In this category, while nominal ownership belongs to the individual mutual fund, independent investment advisors (brokers), or an insurance company, the underlying shareholders in this group are most likely to be individuals subject to the maximum dividend tax penalty.⁷ Since these shareholders are the most affected by the dividend tax penalty, I predict that institutional shareholders in this category are more likely to persuade firms to increase share repurchases after the dividend tax penalty increases. As a result, the third series of hypotheses follows.

Hypothesis 3A. Firms with higher institutional ownership from mutual funds, investment advisors (brokers), or insurance companies are more likely to make distributions to shareholders through share repurchases as opposed to making distributions through special dividends as the dividend tax penalty increases.

Hypothesis 3B. Firms with higher institutional ownership from mutual funds, investment advisors (brokers), or insurance companies are more likely to make distributions to shareholders through share repurchases as opposed to making distributions through increasing regular dividends as the dividend tax penalty increases.

Another identifiable group of shareholders consists of a firm's managers. Among identifiable classes of shareholders, firm managers are the most likely to incur the highest dividend tax penalty. As managerial stock ownership increases, these managers may use their influence to initiate share repurchases during high dividend tax penalty regimes, and increase dividend payments during low dividend tax penalty regimes. Three papers analyze the relation between firms' dividend payments and managerial ownership immediately before and after the passage of JGTRRA in 2003, which decreased the top dividend tax rate for individuals from 38.1% to 15%. Nam, Wang, and Zhang (2004), Dhaliwal and Kahle (2004), and Blouin, Raedy, and Shackelford (2004) find a positive relation between managerial ownership and dividend increases after the passage of

⁷These are the two categories that Grinstein and Michaely (2005) study in their paper on institutional holdings and payout policy. In addition, Lie and Lie (1999) point out that in general mutual funds and insurance companies are taxable.

JGTRRA. However, Blouin, Raedy, and Shackelford (2004) conclude that their finding relation is driven by 17 firms that paid special dividends in 2003.

Instead of just collecting data on aggregate managerial ownership, Thompson Financial records the percentage of stock owned by a firm's insiders and then categorizes the ownership data based on the relative importance of the insider to the firm. Level 1 insider shareholders consist of the firm's chairman of the board, chief executive officer, chief operating officer, president, and general counsel. Levels 2 through 4 insider ownership represents firm insiders with less overall authority in the firm.⁸ Based on this categorization system, I organize firm insider ownership into two different classifications: the first measures the percentage of the firm's stock owned by level 1 insiders and the second measures the percentage of the firm's stock owned by levels 2, 3, and 4 insiders. Since level 1 insider shareholders have the most influence with their firms to change corporate payout policy, Hypothesis 4A and B follows.

Hypothesis 4A. Firms with higher levels of senior managerial ownership (level 1 insider ownership) are more likely to make distributions to shareholders through stock repurchases as opposed to issuing special dividends as the dividend tax penalty increases.

Hypothesis 4B. Firms with higher levels of senior managerial ownership (level 1 insider ownership) are more likely to make distributions to shareholders through stock repurchases as opposed to increasing regular dividends as the dividend tax penalty increases.

Lie and Lie (1999) find that a firm's prior year stock price appreciation influences corporate payout policy. Firms with highly appreciated stock prices are more likely to distribute funds to shareholders as dividends as opposed to share repurchases. The relation between stock price appreciation and corporate payout policy is also dependent on the types of shareholders that own stock in the firm. Among all identifiable classes of shareholders, tax-exempt institutions should be the least concerned with stock price appreciation. Therefore, as compared to other shareholder groups that must pay additional capital gains taxes as a firm's stock price appreciates, other institutional shareholders such as pension funds and charitable endowments derive the greatest benefit from share repurchases. Due to their common dividend tax-favored status, I combine institutional shareholders classified as banks and as other institutional shareholders into one category. As a result, Hypothesis 5A and B follows.

Hypothesis 5A. Firms with higher institutional ownership from banks and other institutional shareholders will be more likely to make distributions to shareholders through share repurchases as opposed to special dividends as the firm's prior year average stock price appreciates.

Hypothesis 5B. Firms with higher institutional ownership from banks and other institutional shareholders will be more likely to make distributions to shareholders

⁸See TFN Insider Filing Data available from Thompson Financial available on WRDS for the specific types of insider shareholders in levels 1, 2, 3, and 4.

through share repurchases as opposed to increases in regular dividends as the firm's prior year average stock price appreciates.

Institutional shareholders categorized as mutual funds, independent investment advisors (brokers), and insurance companies are either fully taxable shareholders themselves or have underlying shareholders likely to be subject to the highest marginal tax rates on capital gains. Therefore, as compared to other groups of shareholders, as a firm's stock price appreciates and shareholders are confronted with taxes on larger capital gains, institutional shareholders classified as insurance companies, mutual funds, and independent investment advisors (brokers) are likely to influence the firm to make distributions through dividends. As a result, Hypothesis 6A and B follows.

Hypothesis 6A. Firms with higher institutional ownership from mutual funds, investment advisors (brokers), and insurance companies will be more likely to make distributions to special dividends as opposed to share repurchases as the firm's prior year average stock price appreciates.

Hypothesis 6B. Firms with higher institutional ownership from mutual funds, investment advisors (brokers), and insurance companies will be more likely to make distributions to shareholders through increases in regular dividends as opposed to making distributions through share repurchases as the firm's prior year average stock price appreciates.

Hypothesis 7A and B involves corporate payout policy in circumstances of increasing level 1 insider ownership and increasing firm stock price. Under these circumstances, senior managers may want to avoid recognizing significant capital gains and avoid diluting their ownership interest in the firm.

Hypothesis 7A. Firms with higher levels of senior managerial ownership (level 1 insider ownership) are more likely to make distributions to shareholders through special dividends as opposed to stock repurchases as the firm's stock price appreciates.

Hypothesis 7B. Firms with higher levels of senior managerial ownership (level 1 insider ownership) are more likely to make distributions to shareholders through increases in the regular dividend as opposed to stock repurchases as the firm's stock price appreciates.

IV. Sample and Data

Table 2 summarizes the sample selection procedures. Consistent with Dittmar (2000) and Lie (2004), I measure common share repurchases as (Compustat item #115) purchases of common and preferred stock minus ($\#56_t - \#56_{t-1}$) the change in the liquidation value of preferred stock. Also consistent with Dittmar (2000) and Lie (2004), common stock repurchases that are less than 1% of the prior year's market values of equity are set equal to zero. This procedure yields an initial sample of 24,898 share repurchases for the period 1986–2004.

Following DeAngelo, DeAngelo, and Skinner (2000) and Lie (2004), I identify special dividends using CRSP Distribution Codes 1262 or 1272. This pro-

cedure identifies an initial sample of 3,479 special dividends between 1986 and 2004. Finally, I measure firms' regular annual split-adjusted dividends as (Compustat item #26/#27) dividends per share by ex-date divided by the adjustment factor (cumulative) by ex-date. I classify a firm as increasing its dividend in a given fiscal year if the split-adjusted per-share dividend increases by more than 1%. I then eliminate all regular dividend increasing observations that have a CRSP Distribution Code above 1999. These eliminate dividend distribution relating to liquidating dividends (2000's), dividends distributed as a result of a merger or acquisition (3000's), dividends of stock rights (4000's), stock dividends (5000's) or other types of dividends (6000's and 7000's). Excluding dividend increases identified by Compustat with CRSP Distribution Codes above 2000 reduces the initial sample of regular dividend increases from 39,809 to 26,003 for the period 1986 to 2004.

TABLE 2
Sample Selection

The initial sample of share repurchases consists of all firm-year observations between 1986–2004 in which the purchase of common and preferred stock (Compustat Item #115) minus changes in the redemption value of preferred stock ($\#56_t - \#56_{t-1}$) is greater than 1% of the prior firm-year observation market value of equity. The initial sample of special dividends consists of all dividends reported on the CRSP database with a Distribution Code of 1262 or a Distribution Code of 1272 for the period 1986–2004. The initial sample of dividend increases consists of all firm-year observations between 1986–2004 in which the firm increased its split-adjusted regular annual dividend (#26/#27) by more than 1%. In addition, the dividend must have had a Distribution Code in CRSP between 1200 and 1999. There are 132 observations in which the firm distributed special dividends, increased regular dividends, and repurchased shares. There are 4,245 observations in which the firm distributed funds through share repurchases and increased the regular dividend. There are 265 observations in which the firm distributed funds through share repurchases and issued special dividends. In addition, there are also 1,028 observations in which the firm increased regular dividends and special dividends that are reclassified as distributing only special dividends. Financial Firms are defined as observations with SIC Code 6.

	Firm-Year Observations		
	Share Repurchases	Special Dividends	Regular Dividend Increases
Initial Sample	24,898	3,479	26,003
Less: Multiple Distributions	-4,642	-397	-5,273
Less: Financial Firms	-1,418	-681	-6,982
Less: Firms Missing Compustat or CRSP Data	-4,689	-1,640	-6,166
Less Firms Missing Institutional Ownership	-2,907	-131	-1,543
Less Firms Missing Managerial Info	-666	-75	-1,290
Breakdown Institutional Ownership Sample	10,576	555	4,749

In an effort to only examine firms that either repurchased shares or distributed dividends, all firm-year observations where the firm both repurchased shares and either issued special dividends or increased regular dividends are eliminated. This restriction reduces the sample by 4,642 share repurchases, 397 special dividends, and 5,273 regular dividend increases. Dittmar (2000) and Fenn and Liang (2001) find that financial firms have motives to repurchase stock that are different from other firms. As a result, I exclude all firm-year observations classified as financial firms with a one-digit SIC code equal to six. This procedure gets rid of 1,418 share repurchase observations, 681 special dividend observations, and 6,982 regular dividend increase observations. I then eliminate 4,689 share repurchase observations, 1,640 special dividend observations, and 6,166 regular dividend increase observations due to insufficient financial statement data

in Compustat or insufficient stock price data in CRSP to measure the control variables.

Finally, I exclude all observations that are missing managerial ownership or institutional ownership data. This requirement eliminates 2,907 share repurchase observations for institutional ownership data and 666 observations for managerial ownership data. In addition, 131 special dividend observations are eliminated for lack of institutional ownership data and 75 observations are eliminated for lack of managerial ownership data. Finally, 1,543 regular dividend increase observations are excluded for lack of institutional ownership information and 1,290 observations are eliminated for lack of managerial ownership data. These selection criteria yield a share repurchase sample of 10,576 observations, a special dividend sample of 555 observations, and a regular dividend increase sample of 4,749 observations over the period from 1986 to 2004.⁹

Table 3 summarizes the full sample by year and one-digit industry SIC code. Figure 1 records the yearly percentages of the total number of share repurchases, special dividends, and increases in regular dividends. In each year, stock repurchases and regular dividend increases are larger than special dividends. Analysis of share repurchases by year indicates that beginning in 1993 firms increasingly utilize share repurchases as a method of distributing cash to shareholders. An explanation for the popularity of share repurchases after 1993 is that the dividend tax penalty substantially increases after 1993 due to changes in tax regimes. The largest increase in share repurchases occurs between 1997 and 1998 when the dividend tax penalty increases from 11.6% to 19.6%.

Analysis of special dividend distributions from Table 3, Panel A (Figure 1) reveals that special dividends rapidly increase between 1987 and 1988 when the dividend tax penalty decreases to zero. In contrast, the use of special dividends to distribute funds to shareholders steadily decreases between 1992 and 2002 at a time when the dividend tax penalty is relatively high. Finally, the occurrence of special dividend distributions rapidly increases in 2003 and 2004 after the dividend tax penalty is once again eliminated. This change in the frequency of special dividends corresponds to time periods immediately after a change in the dividend tax penalty. Observations by year of regular dividend increases also appear to change based on the tax regime in existence in a particular year. Starting in 1994 the occurrence of dividend increases declines each year until 2000, and then begins to significantly rebound after the reduction in the dividend tax penalty in 2003. As compared to share repurchases and special dividends, the occurrence of dividend increases appears to change less, probably due to the long-term consequences of altering regular dividends. While firms can take advantage of changing shareholder tax rates with one-time distributions, either in the form of share repur-

⁹I obtain information regarding managerial share ownership from Thompson Financial. I also obtain information regarding institutional share ownership for the years 1986 to 2004 from Thompson. According to Grinstein and Michaely (2005), only institutions with holdings of \$100 million or more under management must file a form 13F with the SEC. The filings are submitted quarterly and include institutional holdings in every U.S. firm as long as the holdings are more than \$200,000 or 10,000 shares. In 1998, Thompson Financial announced a coding problem with their classification of institutional shareholders into one of five different categories. In the second quarter of 1998, Thompson Financial reclassified about 1,000 observations from mutual funds and brokers to the other institutional shareholder category. For purposes of consistency, I manually reclassify institutional shareholders to their pre-1998 category.

TABLE 3
 Sample Statistics by Year and One-Digit SIC Industry Code for Stock Repurchases, Special Dividends, and Regular Dividend Increases (1986–2004)

Share repurchases consist of all firm-year observations between 1986–2004 in which the purchase of common and preferred stock (Compustat Item #115) minus changes in the redemption value of preferred stock ($\#56_t - \#56_{t-1}$) is greater than 1% of the prior firm-year observation market value of equity. To qualify for the sample of 10,576 firm-year stock repurchases, the firm must not have issued special dividends or increased regular dividends in the year of the observation. Furthermore, the firm must not have been a financial firm (SIC 6). Finally, for each stock repurchase firm-year observation, all of the necessary Compustat, CRSP, managerial ownership, and institutional ownership information must be available from Thompson Financial. A special dividend observation consists of all dividends reported on CRSP with a Distribution Code of 1262 or a Distribution Code of 1272 for the period 1986–2004. To qualify for the sample of 555 firm-year special dividend observations, the firm must not have repurchased stock during the year. Furthermore, the firm must not have been a financial firm (SIC 6). Finally, for each special dividend firm-year observation all of the necessary Compustat, CRSP, managerial ownership and institutional ownership information must be available. The special dividend must have been included in the CRSP daily return file in WRDS. Regular dividend increase observations consist of all firm-year observations in which the firm increased its split-adjusted regular dividends (#16/#17) Compustat quarterly file by more than 1% of its split-adjusted dividends in the prior four quarters. The dividend must have had a Distribution Code in CRSP between 1200 and 1999, excluding 1262 and 1272. To qualify for the sample of 4,749 firm-year regular dividend observations, the firm must not have repurchased stock or issued special dividends during the year of the observation. Furthermore, the firm must not have been a financial firm (SIC 6). Finally, for each regular dividend increase firm-year observation all of the necessary Compustat, CRSP, managerial ownership, and institutional ownership information must be available. The regular dividend must have been included in the CRSP daily return file in WRDS.

	Stock Repurchases		Special Dividends		Dividend Increases	
<i>Panel A. Firm-Year Observations by Year</i>						
1986	336	3.2%	28	5.0%	211	4.4%
1987	493	4.7%	32	5.8%	176	3.7%
1988	425	4.0%	51	9.2%	284	6.0%
1989	327	3.1%	58	10.5%	345	7.3%
1990	429	4.1%	44	7.9%	247	5.2%
1991	317	3.0%	36	6.5%	309	6.5%
1992	318	3.0%	37	6.7%	259	5.5%
1993	272	2.6%	39	7.0%	262	5.5%
1994	352	3.3%	29	5.2%	313	6.6%
1995	411	3.9%	29	5.2%	344	7.2%
1996	507	4.8%	22	4.0%	296	6.2%
1997	641	6.1%	18	3.2%	242	5.1%
1998	1,049	9.9%	18	3.2%	184	3.9%
1999	1,074	10.2%	15	2.7%	170	3.6%
2000	924	8.7%	7	1.3%	149	3.1%
2001	770	7.3%	9	1.6%	201	4.2%
2002	748	7.1%	10	1.8%	197	4.1%
2003	664	6.3%	30	5.4%	262	5.5%
2004	519	4.9%	43	7.7%	298	6.3%
Total	10,576		555		4,749	
<i>Panel B. Observations by One-Digit SIC Industry Code</i>						
SIC 0	22	0.2%	7	1.3%	27	0.6%
SIC 1	530	5.0%	47	8.5%	218	4.6%
SIC 2	2,031	19.2%	126	22.7%	1,149	24.2%
SIC 3	3,708	35.1%	192	34.6%	1,268	26.7%
SIC 4	591	5.6%	36	6.5%	1,121	23.6%
SIC 5	1,429	13.5%	68	12.3%	562	11.8%
SIC 7	1,745	16.5%	64	11.5%	282	5.9%
SIC 8	464	4.4%	9	1.6%	87	1.8%
SIC 9	56	0.5%	6	1.1%	35	0.7%
Total	10,576		555		4,749	

chases or special dividends, increasing regular dividends substantially commits a firm to making future distributions regardless of the future dividend tax penalty.

Table 3, Panel B (Figure 2) divides the full sample by industry, and indicates a higher frequency of regular dividend increase observations for SIC Code 4 (transportation, communications, electric, gas, and sanitary services) and a higher frequency of share repurchases in SIC Code 7 (services).

FIGURE 1
 Percentage of Stock Repurchases, Special Dividends,
 and Regular Dividend Increases by Year

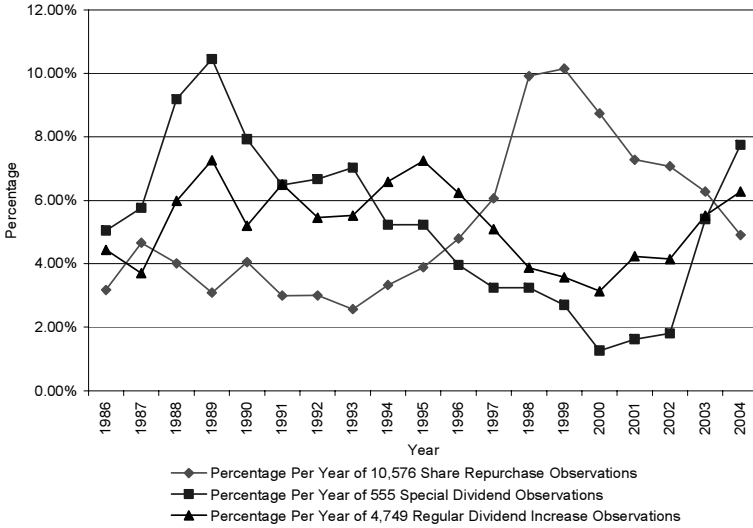
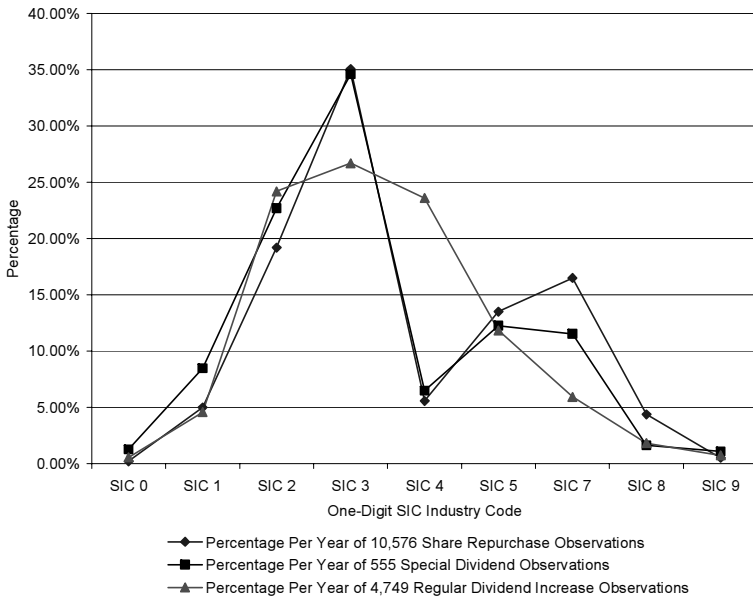


FIGURE 2
 Percentage of Stock Repurchases, Special Dividends,
 and Regular Dividend Increases by One-Digit SIC Industry Codes



V. Empirical Model

To test all seven hypotheses, I estimate the following binomial logistic regression model that compares the tax and non-tax characteristics of firms that repurchase shares to firms that distribute special dividends or firms that increase regular dividends. My prediction for the sign of each independent variable is above the independent variable in parentheses.

$$\begin{aligned}
 (1) \quad \text{Repurchase}^{(+)} &= \alpha_0 + \alpha_1 \text{DivTaxPenalty}^{(-)} \\
 &+ \alpha_2 \text{DivTaxPenalty} * \text{Banks\&Other} \\
 &+ \alpha_3^{(+)} \text{DivTaxPenalty} * \text{MFundsBrokers\&Insurance} \\
 &+ \alpha_4^{(+)} \text{DivTaxPenalty} * \text{MgmtOwn Group1} \\
 &+ \alpha_5^{(?)} \text{DivTaxPenalty} * \text{MgmtOwnGroup2} + \alpha_6^{(-)} \text{PriceChange} \\
 &+ \alpha_7^{(+)} \text{PriceChange} * \text{Banks\&Other} \\
 &+ \alpha_8^{(-)} \text{PriceChange} * \text{MFundsBrokers\&Insurance} \\
 &+ \alpha_9^{(-)} \text{PriceChange} * \text{MgmtOwnGroup1} \\
 &+ \alpha_{10}^{(?)} \text{PriceChange} * \text{MgmtOwnGroup2} + \alpha_{12}^{(-)} \text{MarketBook} \\
 &+ \alpha_{13}^{(+)} \text{Banks\&Other} + \alpha_{14}^{(+)} \text{MFundsBrokers\&Insurance} \\
 &+ \alpha_{15}^{(?)} \text{MgmtOwnGroup1} + \alpha_{16}^{(?)} \text{MgmtOwnGroup2} \\
 &+ \alpha_{17}^{(-/+)} \text{CashRatio} + \alpha_{18}^{(-)} \text{CapExp} + \alpha_{19}^{(-)} \text{OpInc} + \alpha_{20}^{(+)} \text{NonOpInc} \\
 &+ \alpha_{21}^{(0/+)} \text{StdDevEarn} + \alpha_{22}^{(0/+)} \text{AssetSales} + \alpha_{23}^{(-)} \text{DivYield} \\
 &+ \alpha_{24}^{(+)} \text{DivYield}^2 + \alpha_{25}^{(0/+)} \text{LNSize} + \alpha_{26}^{(0/+)} \text{DebtAsset} + \varepsilon.
 \end{aligned}$$

A. Dependent Variable

Actual share repurchases are difficult to measure.¹⁰ Methods used to estimate repurchases include using data on announcements of a firm's intention to repurchase stock provided by the Securities Data Company (SDC), changes in monthly shares outstanding reported in CRSP, changes in the balance of a firm's treasury stock as reported by Compustat, and the statement of cash flows in Compustat. Jagannathan et al. (2000) reports that while Compustat typically overstates common share repurchases, it is likely to be the most accurate measure of actual firm common stock repurchase.¹¹ As a result, this study uses information from a

¹⁰See Jagannathan et al. (2000) for a detailed discussion of the difficulties of measuring actual share repurchases and the alternative methods of estimating a firm's actual repurchase of common stock.

¹¹Jagannathan et al. (2000) report that based on survey information collected by Cook, Krigman, and Leach (1997) estimation of a firm's share repurchases using CRSP information reports about 68% of a firm's actual common stock repurchases. In contrast, estimating a firm's share repurchases using Compustat information reports about 113% of a firm's actual common stock repurchases. Due to a variety of problems, estimation of share repurchases based on information provided by SDC is the least accurate method.

firm's statement of cash flows as provided by Compustat to estimate a firm's share repurchases. If purchase of common and preferred stock (#115) minus changes in the redemption value of preferred stock ($\#56_t - \#56_{t-1}$) is greater than 1% of the prior firm-year observation market value of equity, then I classify a firm as repurchasing stock and set the dependent variable, Repurchase, equal to one.

If the firm makes a special dividend distribution during the year, defined as a dividend distribution with a CRSP Distribution Code of 1262 or 1272, then I classify the firm as issuing a special dividend, and code the dependent variable zero. In the alternative, if the firm increases its regular split-adjusted dividend (#26/#27) in the current year by more than 1% of the prior year split-adjusted dividend and the dividend has a CRSP Distribution Code of between 1200 and 1999 (excluding Codes 1262 and 1272), I classify the firm as increasing its regular dividends and code the dependent variable as zero.

B. Tax Incentive Variables

To test the first four hypotheses, I use four different tax incentive variables. First, DivTaxPenalty equals the difference between the maximum tax rate applied to individual shareholders receiving dividend income and the maximum tax rate applied to individual shareholders recognizing long-term capital gains divided by one minus the maximum tax rate applied to individual shareholders recognizing long-term capital gains.¹² The size of the dividend tax penalty for each year is summarized in Table 1. The coefficient on DivTaxPenalty should be positive if a firm is more likely to repurchase shares instead of distribute special dividends (Hypothesis 1A) or increase regular dividends (Hypothesis 1B) if the shareholders face a higher tax penalty.

To test Hypotheses 2A and B and 3A and B, I subdivide the institutional shareholder variable into two categories. The interaction of DivTaxPenalty with Banks&Other measures the relation between a firm's institutional owners classified as banks or other institutional shareholders and its probability of repurchasing stock as the dividend tax penalty increases. The interaction of DivTaxPenalty with MFundsBrokers&Insurance measures the relation between a firm's institutional owners classified as mutual funds, investment advisors (brokers), and insurance companies and its probability of repurchasing stock as the dividend tax penalty increases. To test Hypothesis 4A and B, I interact the variable DivTaxPenalty and MgmtOwnGroup1. This interaction variable measures the relation between a firm's level 1 insider ownership and its probability of repurchasing stock as opposed to distributing dividends, as the dividend tax penalty increases.

To test Hypotheses 5, 6, and 7, I interact the firm's prior year average price appreciation with variables representing the percentage of stock owned by a particular group of shareholders in the firm. The interaction term PriceChange * Banks&Other measures the relation between a firm's dividend tax-favored institutional shareholders and its probability of repurchasing stock as the firm's

¹²The formula used to calculate the dividend tax penalty is $(t_d - t_{cg}) / (1 - t_{cg})$. The variable t_d is the maximum tax rate for individual shareholders on dividend income and t_{cg} is the maximum tax rate for individual shareholders on recognition of capital gains. This is the same formula used to calculate the dividend tax penalty in Dhaliwal, Krull, Li, and Moser (2005).

prior year stock price increases. In contrast, the interaction term $\text{PriceChange} * \text{MFundsBrokers\&Insurance}$, measures the relation between a firm's dividend tax-disfavored institutional shareholders and the probability of repurchasing shares as the firm's prior year stock price increases. Finally, to test Hypothesis 7A and B, I create the variable $\text{PriceChange} * \text{MgmtOwnGroup1}$ that measures the relation between a firm's level 1 senior managers and the probability of repurchasing shares as the firm's prior year stock price increases.

C. Control Variables

1. Stock Valuation

Prior studies (Vermaelen (1981), Dann (1981), and Stephens and Weisbach (1998)) indicate that firms repurchase their own stock to signal undervaluation to the market. In addition, Lie and Lie (1999) demonstrate that firms are more likely to distribute dividends to shareholders as opposed to repurchasing shares as the firm's prior year average stock price increases. To control for this, I use the variable PriceChange as defined by Lie and Lie (1999). The variable PriceChange , measuring a firm's prior year average appreciation, is calculated as

$$\frac{\left(\sum_{t=-250}^0 \left(\frac{P_0 - P_t}{P_t} \right) \right)}{n},$$

where P_t is the split-adjusted price per share on day t , day 0 is five days before the announcement day, and n is the number of days for which price data are available between trading days -250 and 0. For regular dividend increases and special dividend distributions, day 0 is five days before the CRSP reported declaration date in the year in which the firm distributed the special dividend or increased the regular dividend. For share repurchases, day 0 is five days before the start of the quarter in which the firm repurchases shares.¹³ As a secondary stock valuation control variable, I also include prior year MarketBook , defined as the firm's market value of equity ($\#25 * \#199$) plus book value of total debt ($\#9 + \#34$) plus book value of preferred stock ($\#10$) divided by book value of total assets ($\#6$).

2. Ownership Structure

MgmtOwnGroup1 is defined as the percentage of shares owned by level 1 firm insiders. According to TFN Insider Filing Data collected by Thompson Financial and available on WRDS, level 1 firm insiders include the percentage of the firm owned by the firm's chairman of the board, chief executive officer, chief operating officer, president, and general counsel. These are the individuals who control firm activities and are the most likely group to influence corporate payout policy. As a consequence of contradictory theory and inconsistent results from prior empirical research, I am unable to ex ante predict a relation between MgmtOwnGroup1 and firm payout choice.¹⁴ The percentage of stock owned by

¹³Numerous studies, including Stephens and Weisbach (1998) and Lie (2005), use quarterly share repurchases from Compustat to estimate a firm's repurchasing activity. Therefore, it seems reasonable to assume that the decision to repurchase occurs roughly at the beginning of the firm's fiscal quarter when a firm reports share repurchases.

¹⁴See Rozeff (1982), White (1996), Fenn and Liang (2001), and Nam, Wang, and Zhang (2004).

all additional insiders, including junior management, committee members, affiliates, and other beneficial owners is added together and defined as *MgmtOwnGroup2*. Once again I am unable to ex ante predict a relation between *MgmtOwnGroup2* and firm payout choice.

The first category of institutional shareholders *Banks&Other* equals the number of shares owned by banks and other institutional shareholders divided by the number of shares outstanding at the end of the prior year. The second category, *MFundsBrokers&Insurance*, equals the number of shares owned by mutual funds, investment advisors (brokers), and insurance companies divided by the number of shares outstanding at the end of the prior year. These are the classifications used by Grinstein and Michaely (2005) in their paper on institutional holdings and payout policy.

3. Excess Capital

Stephens and Weisbach (1998) and Dittmar (2000) find that firms' stock repurchases are positively related to their relative cash balance. I use *CashRatio*, defined as the firm's prior year cash balance (#1) divided by prior year assets (#6), to control for the firm's cash balance. Lie (2004) suggests that as a firm's capital expenditures increase, a firm will be more likely to increase dividends as opposed to repurchase shares. *CapExp*, measured as the cash value of investments the firm made in year_{*t*-1} (#128) scaled by total assets in year_{*t*-2} (#6), controls for the firm's capital expenditures.

4. Earnings Sustainability

Jagannathan et al. (2000) and Guay and Harford (2000) find evidence that dividends that are paid out of cash flows are likely to be permanent, while stock repurchases that are paid out of cash flows are not likely to be sustained indefinitely. Based on the above papers, I control for earnings sustainability by using *OpInc*, *NonOpInc*, *StdDevEarn*, and *AssetSale*. *OpInc* equals prior year operating income divided by prior year total assets (#13/#6). *NonOpInc* equals prior year non-operating income divided by prior year total assets (#61/#6). *StdDevEarn* equals the standard deviation of operating income over the previous five years. For the share repurchases and special dividend logistic regression, I anticipate an insignificant coefficient on *StdDevEarn* because both share repurchases and special dividends are one-time distributions making volatility of future earnings irrelevant. For the share repurchases and regular dividend increase logistic regression, I anticipate a positive coefficient on *StdDevEarn*, indicating that as the volatility of a firm's operating income increases, the firm will be more likely to undertake a share repurchase. *AssetSales* equals the value of assets the firm sold in year_{*t*-1} (#107) scaled by the firm's total assets in year_{*t*-2} (#6). For the share repurchases versus special dividends logistic regression, I anticipate an insignificant coefficient on *AssetSales*. For the share repurchase versus the increase in regular dividend logistic regression model, I predict a positive coefficient on *AssetSales* because cash flows generated from asset sales are likely not sustainable into the future.

5. Other Control Variables

Lie and Lie (1999) observe that firms are more likely to distribute dividends instead of repurchasing shares if the firm already pays some, but not too much, in dividends. To control for this, I include the variables *DivYield* and *DivYield*². I calculate a firm's dividend yield as the prior year dividends distributed to shareholders (#21) divided by the prior year ending market value of equity (#25 * #199). Based on prior research, I expect a negative coefficient on *DivYield* indicating that firms that already distribute dividends are more likely to distribute additional dividends as opposed to repurchasing shares. In contrast, I predict a positive coefficient on *DivYield*² indicating that firms that already distribute a significant portion of their earnings as dividends are then more likely to repurchase shares. The variable *LNSize*, defined as the natural log of the firm's prior year market value of equity (#25 * #199), controls for firm size. Consistent with Lie's (2004) findings, I expect that in the share repurchase versus special dividend model larger firms will distribute funds through share repurchases, and in the share repurchase versus regular dividend increase model, larger firms will distribute funds through regular dividend increases. Previous studies find mixed results when they examine the relation of a firm's debt to asset ratio with a firm's payout policy. *DebtAsset* is defined as the firm's prior year total debt (#9 + #34) divided by the firm's prior year assets (#6).

VI. Empirical Results

A. Descriptive Statistics

Table 4 reports the tests of differences in means across the distribution subsamples. Analysis of Table 4 indicates that the dividend tax penalty is significantly larger for firms that repurchase stock as opposed to the dividend tax penalty for firms that either distribute a special dividend or firms that increase their regular dividend. This univariate relation is consistent with Hypothesis 1A and B. That is, firms are more likely to undertake stock repurchases when the dividend tax penalty is relatively higher, and are more likely to distribute dividends when the dividend tax penalty is relatively lower. The univariate tests also support Hypotheses 2, 3, 4, 6, and 7.

Table 5, Panel A summarizes Pearson correlation coefficients for the non-interaction independent variables from the sample of share repurchases and special dividend distributions. Table 5, Panel B summarizes Pearson correlation coefficients for the independent variables from the sample of share repurchases and the sample of firms that increase their regular dividends. Both correlation panels show a significant negative relation between size (log of market value of equity) and managerial ownership. In contrast, both panels show a positive relation between size and institutional ownership. Overall, multicollinearity is not a problem with the data.

TABLE 4
Tests of Differences in Means for the Sample

t-Statistics of Differences in Means (complete ownership sample 1986–2004)

Variable	Stock Repurchase Mean (<i>n</i> = 10,576)	Special Dividend Mean (<i>n</i> = 555)	Dividend Increase Mean (<i>n</i> = 4,749)	<i>t</i> -Statistic Repurchases minus Special Dividends	<i>t</i> -Statistic Repurchase minus Regular Increase
<i>Tax Incentives</i>					
DivTaxPenalty	0.164	0.101	0.127	13.11***	19.66***
DivTaxPenalty * Banks&Other	0.0169	0.0101	0.018	9.48***	-2.40**
DivTaxPenalty * MFundsBrokers&Insurance	0.053	0.020	0.0364	23.96***	19.96***
DivTaxPenalty * MgmtOwnGroup1	0.018	0.012	0.012	3.80***	9.45***
DivTaxPenalty * MgmtOwnGroup2	0.018	0.016	0.015	1.13	4.36***
<i>Stock Valuation</i>					
PriceChange	-0.004	0.073	0.076	-11.09***	-18.56***
PriceChange * Banks&Other	0.002	0.013	0.010	-6.72***	-13.03***
PriceChange * MFundsBrokers&Insurance	0.004	0.026	0.023	-7.16***	-13.24***
PriceChange * MgmtOwnGroup1	0.003	0.020	0.013	-5.40***	-7.34***
PriceChange * MgmtOwnGroup2	0.004	0.020	0.014	-4.97***	-7.37***
MarketBook	1.563	1.455	1.408	1.96**	7.69***
<i>Ownership Structure</i>					
Banks&Other	0.111	0.104	0.148	1.74*	-21.19***
MFundsBrokers&Insurance	0.315	0.202	0.285	16.15***	8.84***
MgmtOwnGroup1	0.113	0.119	0.096	-0.59	4.36***
MgmtOwnGroup2	0.211	0.279	0.214	-3.97***	-0.53
<i>Excess Capital</i>					
CashAsset	0.169	0.185	0.082	-1.77*	34.74***
CapExp	0.070	0.070	0.082	-0.02	-8.96***
<i>Earnings Sustainability</i>					
Oplnc	0.121	0.175	0.160	-11.09***	-18.94***
NonOplnc	0.010	0.015	0.008	-3.05***	4.46***
StdDevEarn	0.069	0.057	0.041	6.71***	34.95***
AssetSale	0.006	0.009	0.005	-1.20	3.43***
<i>Other</i>					
DivYield	0.011	0.035	0.028	-6.92***	-13.16***
DivYield ²	0.016	0.007	0.002	0.93	1.55
DebtAsset	0.203	0.170	0.240	4.25***	-12.23***
LNSize	5.395	4.969	6.300	5.47***	-26.47***

***, **, and * indicate significance at the 0.01, 0.05, and 0.10 levels, respectively, with a two-tailed *t*-test. A test of differences in medians provides similar results.

B. Logistic Regression Results

Table 6 reports the results of estimating equation (1). In model 1, the dependent variable equals one for firms that repurchase shares and equals zero for firms that issue special dividends. In model 2, the dependent variable equals one for firms that repurchase shares and equals zero for firms that increase regular dividends. For both models, a positive coefficient on an independent variable suggests that a firm is more likely to repurchase shares. Model 1 uses the sample of 10,576 share repurchase observations and 555 special dividend observations. Model 2 uses the sample of 10,576 share repurchase observations and 4,749 regular dividend increase observations.

1. Tax Effect

The coefficient on DivTaxPenalty is significantly positive in both models of Table 6 as predicted in Hypothesis 1A and B. As the dividend tax penalty increases, firms are more likely to repurchase shares than to distribute special dividends (model 1) or to increase regular dividends (model 2). These results are

TABLE 5
Pearson Correlation Coefficients

Values in bold type indicate significance at $p < 0.01$. Table 5 does not include interaction terms due to space considerations. The table includes the sample of 10,576 share repurchases and the sample of 555 special dividends per Table 2. See the Appendix for variable definitions.

Panel A. Pearson Correlation Coefficients for Share Repurchases and Special Dividends

	DivTaxPenalty	PriceChange	MarketBook	Banks&Other	MFundsBrokers&Insurance	MgmtOwnGroup1	MgmtOwnGroup2	CashAsset	CapExp	OpInc	NonOpInc	StdDevEarn	AssetSale	DivYield	DivYield ²	DebtAsset	LNSize
DivTaxPenalty	1.00																
PriceChange	-0.04	1.00															
MarketBook	0.06	0.09	1.00														
Banks&Other	-0.14	0.09	0.10	1.00													
MFundsBrokers&Insurance	0.05	0.07	0.13	0.44	1.00												
MgmtOwnGroup1	-0.01	0.06	0.03	-0.13	-0.11	1.00											
MgmtOwnGroup2	-0.05	0.07	0.18	-0.10	-0.16	0.26	1.00										
CashAsset	0.00	-0.07	0.29	-0.12	-0.02	0.04	0.02	1.00									
CapExp	0.01	0.05	0.07	0.00	-0.01	0.05	0.05	-0.11	1.00								
OpInc	-0.04	0.21	0.07	0.19	0.19	0.05	0.04	-0.21	0.12	1.00							
NonOpInc	-0.02	0.00	0.05	-0.04	-0.04	0.01	0.00	0.17	-0.01	-0.09	1.00						
StdDevEarn	0.07	0.05	0.36	-0.19	-0.11	0.07	0.05	0.34	0.10	-0.29	0.05	1.00					
AssetSale	0.01	-0.01	-0.05	-0.03	-0.02	0.00	0.00	-0.06	0.28	0.00	0.02	0.00	1.00				
DivYield	-0.03	-0.01	-0.04	0.01	-0.04	-0.03	-0.01	-0.03	-0.01	-0.02	0.01	-0.05	-0.01	1.00			
DivYield ²	0.00	-0.02	0.01	-0.01	-0.01	-0.01	0.00	0.02	-0.01	-0.05	0.01	0.00	0.00	0.91	1.00		
DebtAsset	0.00	0.02	-0.17	0.01	-0.02	-0.02	0.01	-0.46	0.06	0.00	-0.08	-0.17	0.09	0.07	0.02	1.00	
LNSize	0.02	0.08	0.30	0.63	0.51	-0.12	-0.09	-0.13	0.03	0.23	-0.04	-0.18	-0.04	0.02	-0.02	0.06	1.00

(continued on next page)

TABLE 5 (continued)
Pearson Correlation Coefficients

Values in bold type indicate significance at $p < 0.01$. Table 5 does not include interaction terms due to space considerations. The table includes the sample of 10,576 share repurchases and the sample of 4,749 special dividends per Table 2. See the Appendix for variable definitions.

Panel B. Pearson Correlation Coefficients for Share Repurchases and Increases in Regular Dividends

	DivTaxPenalty	PriceChange	MarketBook	Banks&Other	MfundsBrokers&Insurance	MgmtOwnGroup1	MgmtOwnGroup2	CashAsset	CapExp	OpInc	NonOpInc	StdDevEarn	AssetSale	DivYield	DivYield ²	DebtAsset	LNSize
DivTaxPenalty	1.00																
PriceChange	-0.04	1.00															
MarketBook	0.06	0.09	1.00														
Banks&Other	-0.14	0.10	0.10	1.00													
MfundsBrokers&Insurance	0.05	0.07	0.13	0.44	1.00												
MgmtOwnGroup1	-0.01	0.06	0.03	-0.13	0.11	1.00											
MgmtOwnGroup2	-0.05	0.07	0.18	-0.10	0.16	0.26	1.00										
CashAsset	0.00	-0.07	0.29	0.12	-0.02	0.04	0.02	1.00									
CapExp	0.01	0.05	0.07	0.00	-0.01	0.05	0.05	-0.11	1.00								
OpInc	-0.04	0.21	0.07	0.19	0.19	0.05	0.04	-0.21	0.12	1.00							
NonOpInc	-0.02	0.00	0.05	-0.04	-0.04	0.01	0.00	0.17	-0.01	-0.09	1.00						
StdDevEarn	0.07	-0.05	0.36	0.19	0.11	0.07	0.05	0.34	0.10	-0.29	0.05	1.00					
AssetSale	0.01	-0.01	-0.05	-0.03	0.02	0.00	0.00	0.06	0.28	0.00	0.02	0.00	1.00				
DivYield	-0.03	-0.01	-0.04	0.01	0.04	-0.03	-0.01	-0.03	-0.01	-0.02	0.01	-0.05	-0.01	1.00			
DivYield ²	0.00	-0.02	-0.01	-0.01	-0.01	-0.01	0.00	0.02	-0.01	0.05	0.01	0.00	0.00	1.00			
DebtAsset	0.00	0.02	-0.17	0.01	-0.02	-0.02	0.01	-0.46	0.06	0.00	-0.08	-0.17	0.09	0.07	1.00		
LNSize	0.02	0.08	0.30	0.63	0.51	-0.12	-0.09	-0.13	0.03	0.23	-0.04	-0.18	-0.04	0.02	-0.02	1.00	
																0.06	1.00

consistent with the view that as the dividend tax penalty increases, dividends are more costly to shareholders than are capital gains from repurchases.

The coefficient on the interaction term $\text{DivTaxPenalty} * \text{Banks\&Other}$ is negative and significant for both models 1 and 2, consistent with Hypothesis 2A and B. Thus, firms with a higher proportion of dividend tax-favored institutional shareholders, classified as banks and other institutional shareholders, are less likely to make distributions to shareholders through stock repurchase as

TABLE 6
Logistic Regression Results

The explanatory variables are defined in the Appendix. Model 1 uses the sample of 10,576 share repurchases and 555 special dividend distributions. Model 2 uses the sample of 10,576 share repurchases and 4,749 regular dividend increases. The samples are defined in Table 2.

Model 1: Dependent Variable Equals One for a Stock Repurchase or Zero for a Special Dividend
Model 2: Dependent Variable Equals One for a Stock Repurchase or Zero for a Regular Dividend Increase
(asymptotic t -statistics below each estimated coefficient)

Variable & Goodness of Fit	Predicted Sign	Model 1 Special Dividend		Model 2 Regular Dividend Increase	
		Coefficient Estimate (t -statistic)	ΔProb	Coefficient Estimate (t -statistic)	ΔProb
Intercept		2.267*** 10.786		1.572*** 13.817	
<i>Tax Incentives</i>					
DivTaxPenalty	+	4.391*** 5.103	0.52%	2.540*** 5.802	3.07%
DivTaxPenalty * Banks&Other	-	-14.623*** 2.927	-0.46%	-5.222** 2.426	-1.39%
DivTaxPenalty * MFundsBrokers&Insurance	+	10.209*** 3.428	0.57%	4.563*** 4.110	2.61%
DivTaxPenalty * MgmtOwnGroup1	+	0.993 0.503	0.06%	1.423* 1.664	0.70%
DivTaxPenalty * MgmtOwnGroup2	?	-2.013# 1.379	-0.12%	-1.167* 1.768	-0.63%
<i>Stock Valuation</i>					
PriceChange	-	-0.844*** 3.625	-0.41%	-1.057*** 6.131	-4.17%
PriceChange * Banks&Other	+	1.792# 1.338	0.20%	2.514*** 2.756	1.14%
PriceChange * MFundsBrokers&Insurance	-	-1.641** 1.984	-0.26%	-1.013** 2.332	-1.25%
PriceChange * MgmtOwnGroup1	-	-0.018 0.346	0.00%	0.056 0.566	0.06%
PriceChange * MgmtOwnGroup2	?	-0.260 0.443	-0.03%	-0.295 0.851	-0.28%
MarketBook	-	0.086 1.476	0.17%	-0.071*** 2.864	-1.23%
<i>Ownership Structure</i>					
Banks&Other	+	2.077** 2.213	0.23%	0.084 0.201	0.10%
MFundsBrokers&Insurance	+	2.469*** 5.071	0.55%	0.506** 2.425	1.67%
MgmtOwnGroup1	?	0.221 0.741	0.07%	-0.430*** 2.817	-1.22%
MgmtOwnGroup2	?	0.016 0.114	0.01%	-0.040 0.577	-0.19%

(continued on next page)

TABLE 6 (continued)
Logistic Regression Results

Variable & Goodness of Fit	Predicted Sign	Model 1 Special Dividend		Model 2 Regular Dividend Increase	
		Coefficient Estimate (<i>t</i> -statistic)	Δ Prob	Coefficient Estimate (<i>t</i> -statistic)	Δ Prob
<i>Excess Capital</i> CashRatio	—/+	−1.177*** 3.712	−0.35%	2.423*** 12.113	4.51%
CapExp	−	−0.415 0.760	−0.06%	−2.384*** 8.625	−2.92%
<i>Earnings Sustainability</i> Oplnc	−	−4.484*** 8.234	−1.69%	−1.659*** 5.676	−3.56%
NonOplnc	+	−2.225 1.492	−0.14%	0.461 0.711	0.21%
StdDevEarn	0 / +	6.241*** 5.065	0.47%	8.251*** 11.869	5.14%
AssetSale	0 / +	−1.774* 1.745	−0.09%	3.354*** 3.333	1.24%
<i>Other</i> DivYield	−	−34.703*** 15.931	−48.78%	−53.596*** 35.642	−83.65%
DivYield ²	+	36.865*** 10.406	1.38%	68.902*** 18.191	14.34%
LNSize	−	−0.014 0.418	−0.04%	−0.149*** 9.896	−4.28%
DebtAsset	?	0.977*** 3.077	0.24%	0.749*** 5.274	1.65%
ρ^2 (pseudo — R^2)		20.40%		26.16%	
% Correct Predictions		84.60%		84.80%	
Likelihood Ratio ρ (prob)		< 0.0001		< 0.0001	
Observations		<i>n</i> = 11,130		<i>n</i> = 15,325	

***, **, and * indicate significance at the 0.01, 0.05, and 0.10 levels, respectively (two-tailed test without sign prediction). # indicates significance at the 0.1 level (one-tailed test with sign prediction).

the dividend tax penalty increases. The coefficient on the interaction of DivTaxPenalty * MFundsBrokers&Insurance is significantly positive in both models 1 and 2 as predicted by Hypothesis 3A and B. Firms with a higher proportion of institutional shareholders classified as mutual funds, investment advisors (brokers), and insurance companies are more likely to make distributions to shareholders through stock repurchases as opposed to either special dividend distributions or regular dividend increases as the dividend tax penalty increases.

The coefficient on the interaction term DivTaxPenalty * MgmtOwnGroup1 is significant in model 2 supporting Hypothesis 4B. This result indicates that firms with a higher proportion of managerial ownership are more likely to make distributions to shareholders through stock repurchases as opposed to increasing regular dividends as the dividend tax penalty increases. The coefficient on the interaction term DivTaxPenalty * MgmtOwnGroup1 is positive but insignificant in model 1, failing to support Hypothesis 4A.

Hypotheses 5A and B through 7A and B predict the effect on corporate payout policy as the firm's stock price changes under different groups of ownership. The coefficient on the interaction term PriceChange * Banks&Other is positive and significant in model 2 and marginally positive and significant in model 1,

supporting Hypothesis 5A and B. In an unreported test, I create two separate categories, one for banks interacted with the variable PriceChange and one category for other institutional shareholders interacted with the variable PriceChange. The results indicate that the interaction of other institutional shareholders with PriceChange is positive and statistically significant while the interaction of banks and PriceChange is insignificant.

The coefficient on PriceChange * MFundsBrokers&Insurance is negative and significant in both models 1 and 2, indicating that as a firm's prior year stock price increases and as ownership by mutual funds, independent investment advisors (brokers), and insurance companies increases firms are more likely to either distribute special dividends or increase regular dividends as opposed to repurchasing shares. This finding supports Hypothesis 6A and B. Finally, the coefficient on PriceChange * MgmtOwnGroup1 is insignificant in both models, failing to provide support for Hypothesis 7A and B.

2. Controls

Table 6 also shows the effect of controlling for nontax reasons that explain firms' choices among repurchases, special dividends, and increases in regular dividends. In the stock valuation category, the coefficient on PriceChange is negative and significant in both models, supporting Lie and Lie's (1999) conclusion that firms are more likely to increase regular dividends than they are to repurchase shares as their prior year stock price appreciates. The alternative proxy for the stock undervaluation category is the variable MarketBook. Firms with lower market-to-book ratios are more likely to be perceived as undervalued and are therefore more likely to use share repurchases. Consistent with ex ante predictions, the coefficient on MarketBook is negative and significant in model 2. The insignificant result in model 1 may be due to the firm's market-to-book ratio also proxying for potential investment opportunities.

The coefficient on Banks&Other is positive and significant in model 1 and insignificant in model 2. This result indicates that firms are more likely to repurchase shares, as opposed to distribute special dividends to shareholders, as ownership by banks and other institutional shareholders increases. The coefficient on MFundsBrokers&Insurance is positive and significant in model 2 and marginally significant in model 1. This indicates that as ownership by mutual funds and independent investment advisors (brokers) increases, firms are more likely to repurchase shares as opposed to distributing special dividends or increasing regular dividends.

The coefficient on MgmtOwnGroup1 is negative and significant in model 2, indicating that as level 1 insider ownership increases firms are more likely to increase regular dividends as opposed to repurchasing shares.¹⁵ The coefficient on MgmtOwnGroup2 is insignificant in both models 1 and 2.

¹⁵Further analysis indicates that the relation between a firm's managerial ownership and a firm's corporate payout policy follows a nonlinear convex pattern. The coefficient on MgmtOwnGroup1 is negative, while the coefficient on (MgmtOwnGroup2)² is positive. These results indicate that firms with little managerial ownership or firms with significant managerial ownership prefer share repurchases.

The coefficient on CashRatio is negative and significant in model 1 but positive and significant in model 2. This result provides contradictory evidence for the excess capital category and suggests that firms with higher cash balances prefer distributing funds to shareholders through special dividends as opposed to share repurchases and prefer to distribute funds to shareholders through share repurchases as opposed to increasing regular dividends. CapExp is negative and significant only in model 2, indicating that firms are more likely to increase regular dividends as opposed to repurchasing shares as their capital expenditures increase.

OpInc is negative and significant in both models 1 and 2. This is consistent with prior findings that operating income is generally paid out as dividends. In contrast, the coefficient on NonOpInc is insignificant in both models 1 and 2. This finding is inconsistent with previous research that finds that non-operating income is generally paid out to shareholders through share repurchases. The coefficient on StdDevEarn is positive and significant in both models 1 and 2 indicating that firms with greater variability of earnings are likely to choose share repurchases as opposed to dividends for distributing funds to shareholders. The coefficient on AssetSale is negative and significant in model 1 but positive and significant in model 2. A firm that increases dividends generally commits itself to future distributions. If a firm's earnings are volatile, the firm may be reluctant to make that future commitment. Therefore, a positive coefficient for StdDevEarn and a positive coefficient AssetSale for model 2 is consistent with prior theory. Since neither share repurchases nor special dividends commit firms to future payouts, it appears that the volatility of a firm's operating income or the cash generated from asset sales should not influence the choice between distributing cash through share repurchases or special dividends; however, a positive coefficient for StdDevEarn and a negative coefficient for AssetSale in model 1 is contrary to prior expectations.

In both models, the coefficient on the variable DivYield is negative while the coefficient on the variable DivYield² is positive. This finding supports the conclusion that firms are more likely to distribute dividends as opposed to repurchase shares if the firm already distributes some, but not too much, in dividends. The control variable, LNSize is negative and significant in model 2 indicating that larger firms are more likely to increase regular dividends than to repurchase shares. The coefficient on LNSize is insignificant in model 1. The coefficient on the variable DebtAsset is positive and significant in both models 1 and 2 indicating firms with excess borrowing capacity are more likely to distribute dividends.¹⁶

VII. Conclusions

This study investigates whether the difference in individual shareholder tax rates between dividend income and capital gain (the dividend tax penalty) affects a firm's choice between distributing funds to shareholders through dividends or

¹⁶In an unreported test, the coefficient on the variable Management Options is positive and significant indicating that firms with larger numbers of managerial stock options outstanding are more likely to repurchase shares to fund those options. This variable was omitted from the logit analysis because data for managerial options is only available from 1992 to 2004. Including the variable Management Options in the analysis does not change the results, but weakens the significance of the coefficients.

share repurchases. The results suggest that the dividend tax penalty affects firms' corporate payout policies. More specifically, as the dividend tax penalty increases firms are more likely to repurchase shares than to issue special dividends or increase regular dividends.

Further, the results suggest that alternative classes of shareholders affect corporate payout choice as the dividend tax penalty increases. Subdividing institutional shareholders into a group in which the underlying shareholders are most likely taxable and a group in which the underlying shareholders are either tax favored or tax exempt produces results consistent with theory. As taxable institutional shareholder ownership (mutual funds, brokers, and insurance companies) increases and the dividend tax penalty increases, firms are more likely to repurchase shares as opposed to distributing dividends. In contrast, as nontaxable or tax-favored institutional shareholder ownership (banks and other institutional shareholders) increases and the dividend tax penalty increases, firms are less likely to repurchase shares. As firms' level 1 insider ownership increases and the dividend tax penalty increases, firms are more likely to repurchase shares as opposed to distribute dividends. Inside owners classified as level 1 insider ownership shareholders may influence their firms to distribute funds to shareholders with the lowest after-tax cost.

Finally, a firm's stock price appreciation over the prior year, in conjunction with different groups of shareholders, appears to influence corporate payout policy. As a firm's stock price appreciates and the percentage of owners classified as mutual funds, brokers, and insurance companies increases, the firm is more likely to distribute dividends. In contrast, as the firm's stock price appreciates and the percentage of stock owned by tax-exempt institutional shareholders and banks increase, the firm is more likely to repurchase its own shares as opposed to distributing dividends. Collectively, the findings indicate that shareholder taxes significantly affect corporate payout choice.

Appendix. Variable Definitions

Dependent Variable Definition

For the stock repurchase versus special dividend case, the dependent variable equals one if the purchase of common and preferred stock (#115) minus changes in the redemption value of preferred stock ($\#56_t - \#56_{t-1}$) is greater than 1% of the prior firm-year observation market value of equity. In the stock repurchase versus special dividend case, the dependent variable equals zero if the firm issued a dividend during the year with a CRSP Distribution Code of 1262 or 1272.

For the stock repurchase versus increase in regular dividend case, the dependent variable equals one if the purchase of common and preferred stock (#115) minus changes in the redemption value of preferred stock ($\#56_t - \#56_{t-1}$) is greater than 1% of the prior firm-year observation market value of equity. In the stock repurchase versus increase in regular dividend case, the dependent variable is equal to zero if the firm increased its split-adjusted regular dividends (#26/#27) by more than 1% of its prior year regular annual dividends per share and the dividend has a CRSP Distribution Code between 1200 and 1999.

Explanatory Variables

Tax Incentives

DivTaxPenalty measures the difference in the highest marginal tax rate for individual shareholders who recognize dividend income and individual shareholders who recognize long-term capital gains. See Table 1 for summary of the dividend tax penalty by year.

DivTaxPenalty * Banks&Other measures the interaction between the dividend tax penalty that exists in the year of the observation and the percentage of stock owned by institutional shareholders classified as banks or other institutional shareholders such as pension funds, charitable endowments, or other corporations.

DivTaxPenalty * MFundsBrokers&Insurance measures the interaction between the dividend tax penalty that exists in the year of the observation and the percentage of stock owned by institutional shareholders classified as mutual funds, investment advisors (brokers), and insurance companies.

DivTaxPenalty * MgmtOwnGroup1 measures the interaction between the dividend tax penalty that exists in the year of the observation and the percentage of a firm's outstanding stock owned by level 1 insiders classified as senior managers.

DivTaxPenalty * MgmtOwnGroup2 measures the interaction between the dividend tax penalty that exists in the year of the observation and the percentage of a firm's outstanding stock owned by levels 2, 3, and 4 inside shareholders that includes junior managers.

Stock Valuation

PriceChange is calculated as

$$\frac{\left(\sum_{t=-250}^0 \left(\frac{P_0 - P_t}{P_t} \right) \right)}{n},$$

where P_t is the split-adjusted price per share on day t , day 0 is five days before the announcement day, and n is the number of days for which price data are available between trading days -250 and 0. For regular dividend increases and special dividend distributions, day 0 is five days before the firm distributes the special dividend or increases the regular dividend. For share repurchases, day 0 is five days before the start of the quarter in which the firm repurchases shares.

MarketBook is the prior year market value of equity plus prior year book value of debt plus prior year book value of preferred stock divided by prior year book value of assets, $\{[(199 * \#25) + (\#9 + \#34) + \#10]/\#6\}$.

Ownership Structure

Banks&Other equals the percentage of stock owned by institutional shareholders that are classified as banks or other institutional shareholders.

MFundsBrokers&Insurance equals the percentage of stock owned by institutional shareholders that are classified as mutual funds, independent investment advisors (brokers), and insurance companies.

MgmtOwnGroup1 is the percentage of stock owned by level 1 insider shareholders. Thompson Financial defines level 1 insider shareholders as the percentage of stock owned by the firm's chairman of the board, chief executive officer, chief operating officer, president, and general counsel.

MgmtOwnGroup2 is the percentage of stock owned by levels 2, 3, and 4 insider shareholders. Thompson Financial defines the remainder of insider shareholders as junior managers, firm committees, junior officers, minor affiliates, and certain beneficial owners.

Excess Capital Hypothesis

CashAsset is the prior year cash divided by prior year assets (#1/#6).

CapExp is the prior year capital expenditures divided by total assets from two years previously (#128/#6).

Earnings Sustainability

OpInc is the prior period income before extraordinary items divided by prior period total assets (#18/#6).

NonOpInc is the prior period non-operating income divided by prior period total assets (#61/#6).

StdDevEarn is the standard deviation of income before extraordinary items between year_{t-4} and year_t.

AssetSale is the prior year sale of property, plant, and equipment divided by total assets from two years previously (#107/#6).

Other

DivYield is prior year dividends distributed to shareholders (#21) divided by prior year ending market value of equity (#25 * #199).

DivYield² is the square of the variable DivYield.

LNSize is log of the previous year's market value of equity [Log (#199 * #25)].

DebtAsset is the prior year total debt divided by prior year assets (#9 + #34)/#6.

References

- Black, F. "The Dividend Puzzle." *Journal of Portfolio Management*, 2 (1976), 5–8.
- Blouin, J.; J. Raedy; and D. Shackelford. "Did Dividends Increase Immediately after the 2003 Reduction in Tax Rates?" Working Paper, University of North Carolina (2004).
- Brav, A.; J. Graham; C. Harvey; and R. Michaely. "Payout Policy in the 21st Century." Working Paper, Duke University (2004).
- Cook, D.; L. Krigman; and J. Leach. "Corporate Repurchase Programs: Execution Strategy and the Competing Market-Maker Effect." Working Paper, University of Colorado (1997).
- Dann, L. "Common Stock Repurchases: An Analysis of Returns to Bondholders and Stockholders." *Journal of Financial Economics*, 9 (1981), 113–138.
- DeAngelo, H.; L. DeAngelo; and D. Skinner. "Special Dividends and the Evolution of Dividend Signaling." *Journal of Financial Economics*, 57 (2000), 309–354.
- Dhaliwal, D., and K. Kahle. "Dividends, Ownership Structure, and Stock Options." Working Paper, University of Arizona (2004).
- Dhaliwal, D.; L. Krull; O. Li; and W. Moser. "Dividend Taxes and Implied Cost of Equity Capital." *Journal of Accounting Research*, 43 (2005), 675–708.
- Dittmar, A. "Why Do Firms Repurchase Stock?" *Journal of Business*, 73 (2000), 331–355.
- Fenn, G., and N. Liang. "Corporate Payout Policy and Managerial Stock Incentives." *Journal of Financial Economics*, 60 (2001), 45–72.
- Grinstein, Y., and R. Michaely. "Institutional Holdings and Payout Policy." *Journal of Finance*, 40 (2005), 1389–1426.
- Guay, W., and J. Harford. "The Cash-Flow Permanence and Information Content of Dividend Increases versus Repurchases." *Journal of Financial Economics*, 57 (2000), 385–415.
- Jagannathan, M.; C. Stephens; and M. Weisbach. "Financial Flexibility and the Choice between Dividends and Stock Repurchases." *Journal of Financial Economics*, 57 (2000), 355–384.
- Lie, E. "Financial Flexibility, Performance, and the Corporate Payout Choice." Working Paper, College of William & Mary (2004).
- Lie, E. "Operating Performance Following Open Market Share Repurchase Announcements." *Journal of Accounting and Economics*, 39 (2005), 411–436.
- Lie, E., and H. Lie. "The Role of Personal Taxes in Corporate Decisions: An Empirical Analysis of Share Repurchases and Dividends." *Journal of Financial and Quantitative Analysis*, 34 (1999), 533–552.

- Nam, J.; J. Wang; and G. Zhang. "The Impact of Dividend Tax Cut and Managerial Stock Holdings on a Firm's Dividend Policy." Working Paper, Pace University (2004).
- Rozeff, M. "Growth, Beta and Agency Costs as Determinants of Dividend Payout Ratios." *Journal of Financial Research*, 5 (1982), 249–259.
- Stephens, C., and M. Weisbach. "Actual Share Reacquisitions in Open-Market Repurchase Programs." *Journal of Finance*, 53 (1998), 313–333.
- Strickland, D. "Determinants of Institutional Ownership: Implications for Dividend Clienteles." Working Paper, Arizona State University (2002).
- Vermaelen, T. "Common Stock Repurchases and Market Signaling: An Empirical Study." *Journal of Financial Economics*, 9 (1981), 139–183.
- White, L. "Executive Compensation and Dividend Policy." *Journal of Corporate Finance*, 2 (1996), 335–358.