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Investors' Payout-form Preference and Taxes☆

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Abstract

We find the form of U.S. corporate cash payout to shareholders often relevant to share price and in different directions at different times. Regularly cash-dividend paying firms have a significant share price premium compared to regularly stock-repurchasing firms in the early 1970s, but this premium exhibits a significant general negative trend and turns into a discount in the mid-to-late 2000s. Also, the premium (discount) is significantly related to the time-series changes in the differential tax burden on dividends and long-term capital gains. It is not related to the excess market return.

JEL classification: G35; G11

Keywords: Form of corporate cash payout; Investors' preference; Taxes; Investors' rationality.

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1. Introduction

Miller and Modigliani (1961) raise the following questions: Do companies with generous distribution policies consistently sell at a premium over those with niggardly payouts? Is the reverse ever true? Baker and Wurgler (2004b) find the *payment versus non-payment* of dividends highly relevant to share price, but in different directions at different times, and they conclude that when the dividend premium is high, investors are seeking firms that exhibit salient characteristics of safety, including dividend payment.[1] In this paper, we study the following complementary questions: Is the *form* of cash payout to shareholders relevant to share price? If so, is the relation time-varying? And if so, is it in relation to the effective differential tax-burden on dividends and long-term capital gains? The following two issues motivate our research.

First, the U.S. corporate supply of cash dividends instead of significantly-tax-advantaged capital gains, i.e. discretionarily home-made dividends, in the form of low-transaction-cost non-proportionate stock repurchases is a long-standing puzzle, unless shareholders prefer them over the latter.[2] Investors may have such preference because of psychological (Shefrin and Statman (1984)) or information-asymmetry reasons (Barclay and Smith (1988), Brennan and Thakor (1990)). Yet, empirical evidence on investors' payout-form preference is at best scant despite its important implications for the investor-rationality assumption in Miller and Modigliani's (1961) theory, for how the tax treatment of dividends affects the firm's cost of capital, and the optimal practice of corporate payout policy.[3] An important benefit of examining two methods of

[1] Long (1978), Poterba (1986), and Hubbard and Michaely (1997) provide related evidence by examining the two classes of common stock of the Citizens Utilities Company. However, they reach different conclusions.
[2] For a review of the arguments relating to this statement, Appendix A is readily available from the authors.
[3] We found three studies that provide some evidence relating to investors' payout-form preference. Guay and Harford (2000) report that stock price reactions to dividend increases are greater than the reactions to repurchases. Grinstein and Michaely (2005) report that institutions prefer dividend-paying over non-dividend-paying firms, low-dividend over high-dividend stocks, stock repurchasing over non-repurchasing firms, and regular repurchasing over non-regular repurchasing firms. Blouin, Raedy and Shackelford (2011) find that directors and officers, but not other individual investors, rebalanced their portfolios to maximize after-tax returns following the 2003 tax law changes.

corporate cash disbursement is that the resulting evidence is not confounded by potential agency costs of earnings' retention (Jensen (1986)) or difference in growth options.[4]

Second, the surveys of Brav, Graham, Harvey and Michaely (2005, 2008) indicate that financial executives consider taxes a second-order concern in their decision about whether to pay or to increase dividends, and in their choice of payout-form.[5] This managerial subordination of investors' tax-related interests may be sub-optimal, unless taxes have no important effects in the pricing of dividends.[6] Prior evidence on this topic is inconclusive (see Black and Scholes (1974), Michaely (1991), Fama and French (1998), and Graham (2003)).[7]

We form two Compustat firm-year basic samples: Firms that only pay cash dividends regularly and firms that only repurchase their stock regularly. For robustness, we also form two expanded samples: Firms that payout regularly and their total net payout is mostly or totally in the form of cash dividends and firms that payout regularly and their total net payout is mostly or totally in the form of stock repurchase. We compare the market-to-book value (M/B) of assets of the regularly dividend payers and the regularly stock repurchasers, over the period 1971 to 2010.[8] We find similar results in the basic and expanded samples: The log-difference in M/B sample means (medians) is significantly positive in the early 1970s, indicating a valuation premium to regularly dividend payers; it exhibits a general negative trend throughout the 1970s;

[4] Baker and Wurgler (2004a) point out that "there is a whole profile of firm characteristics that differs across payers and nonpayers, including profitability and size, and the raw dividend premium variable does not control for the valuation of these characteristics" (see page 1136). This explanation is consistent with the evidence in Chay and Suh (2009) and Hoberg and Prabhala (2009) pertaining to the relative riskiness of dividends and retained earnings.

[5] In regressions of the propensity to pay dividends on the relative tax-burden on dividends versus long-term capital gains, Baker and Wurgler (2004a,b) find that the tax variable has consistently the wrong sign.

[6] The traditional view of dividend taxation is that it raises the cost of equity finance (see for example Poterba and Summers (1985)) and therefore, it distorts firms' investment. However, following Auerbach (1979), firms use retained earnings as the marginal source of finance, which makes dividend taxation non-distortionary. Korinek and Stiglitz (2009) propose that when firms are started, their marginal source of finance is equity markets (i.e. they issue equity); however, internally growing and mature firms, their marginal source of finance is retained earnings.

[7] Black and Scholes (1974), Michaely (1991), and Fama and French (1998) use three different research approaches but with no clear conclusion. For the reader's convenience, Appendix B provides a detailed review of the literature on the tax effects in the pricing of dividends and is readily available from the authors.

[8] The number of regularly repurchasers is very small before 1971.

it fluctuates during the 1980s and 1990s around a level that indicates investor indifference or slight preference for regularly dividend payers; it declines sharply throughout the early- to mid-2000s and becomes significantly negative; and finally, it reverses part of this decline in the late 2000s.

We recognize the above time-changing divergence in the valuation of regularly dividend-payers and stock-repurchasers may be due to confounding factors, such as the ones indicated by Jagannathan, Stephens and Weisbach (2000), Grullon and Michaely (2002), and Lee and Suh (2009). For this reason, we use specified cut-off points in the distributions of firm profitability, cash flow volatility, size, financial life-cycle stage, and total net payout yield to form groups of homogeneous sample firm-year observations based on the following sets of firm attributes: (1) profitability, cash flow volatility, and total net payout yield; (2) profitability, size, and total net payout yield; and (3) profitability, financial life-cycle stage, and total net payout yield.[9] Then, for each group, we compute the mean market-to-book ratio for the sub-group of dividend payers and the mean for the sub-group of stock repurchasers, and the difference between the natural logarithms of these means. The payout-form premium (discount) in calendar year *t* is the mean (median) of the log differences across all groups. We find that all three sets of matching criteria provide estimates for the payout-form premium that are close and change over time together, and they exhibit similar general trends and shifts as the ones observed in the time-series of the log-difference in M/B sample means (medians). Their correlations with the latter exceed +0.66.

For additional robustness, we control for other potentially-confounding factors using multivariate analysis. We regress the log market-to-book of the sample firms on each of the above measures of payout-form premium, and we include in each model the variables that Fama

[9] We used all other possible combinations of these indicated confounding factors to match regularly cash dividend payers with regularly stock repurchasers. The results are readily available from the authors for examination, and they are very similar to the ones reported here.

and French (1998) find significant determinants of firm value, namely earnings, investment, research and development, financial leverage, and payout. We find the statistical significance of the payout-form premium measures robust to the inclusion of these firm characteristics.

We investigate further the robustness of our findings by using a sample of declarations of special cash dividends. Since these one-time distributions could have been made through irregular stock repurchases, investors' time-varying payout-form preference must be reflected in their immediate response to these usually unexpected declarations. We find the annual series of the mean two-day declaration-period abnormal stock return divided by the dollar amount of the special dividend and the mean standardized bang-for-the-buck (i.e. using the standardized abnormal return) over the period 1971-2010 significantly positively correlated with the corresponding series of the payout-form premium estimates. Their correlations are not spurious as the hypothesis the series are non-stationary is rejected at conventional levels.

We study our last research question by performing regressions of the time-series payout-form premium estimates on the differential tax-burden on dividends and long-term capital gains. We use four proxies of the differential, as concurrent and lagged variables.[10] We also include in the regressions the excess stock market return, to proxy for the business cycle, and a linear trend variable as a control variable. We find that investors' payout-form preference is generally statistically related to the differential tax-burden on dividends and capital gains. We also find the coefficient of the excess market return statistically insignificant, which supports further the robustness of our proxies for investors' payout-form preference since they are evidently not correlated with the business cycle. Moreover, we find that investors' payout-form preference exhibits a significant negative trend, which may represent lessening information-asymmetry

[10] Investors might not have the information on their current tax liabilities at the beginning of the year.

(Barclay and Smith (1988)) due to improvement in corporate disclosures,[11] declining information collection costs (Brennan and Thakor (1990)) due to advances in information technology, or falling costs of home-making dividends.[12]

The theoretical and practical implications of our results follow. We show that the form of U.S. corporate cash payout matters, just as the payment versus non-payment of dividends matters (Baker and Wurgler (2004b)). Also, while we do not directly test or rule out the existence of investor behavioral biases, our finding that the differential tax-burden on dividends and long-term capital gains is generally a statistically significant determinant of investors' payout-form preference indicates rational economic behavior. This evidence supports the investor-rationality assumption underlying Miller and Modigliani's (1961) theory and shows that the marginal investor is evidently not tax-exempt as Miller and Scholes (1978) propose. It also implies that managers' subordination of the tax issue, as indicated in the studies of Brav, Graham, Harvey and Michaely (2005, 2008), is evidently often times sub-optimal.[13]

Section 2 describes our research method and samples. Sections 3 and 4 present the payout-form premium estimates over the 1971-2010 period and the results of the robustness tests. Section 5 explores the relation between the time-series variation in investors' payout-form preference and the differential tax-burden on dividends and capital gains. Section 6 concludes.

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[11] For instance, the Financial Accounting Standards Board adopted new reporting requirements that include preparation and disclosure of cash flow statement, reporting on divisions within a multi-business firm, consolidation of the financial statements of special purpose entities, etc.

[12] The direct and indirect costs of home-making dividends diminished significantly over the years with the decrease in brokerage fees, the advent of many new stockbroker services such as checking accounts, and the decrease in the market impact costs due to increased trading volume and the decimalization of price quotes.

[13] A review of the empirical studies on whether corporate executives generally cater to investors' dividend preferences (*à la* Baker and Wurgler (2004a)) reveals that the evidence is mixed. On one hand, Baker and Wurgler (2004a,b), Chetty and Saez (2005), Li and Lie (2006), and Becker, Ivkovic and Weisbenner (2011) report evidence that suggests dividend decisions are shaped by investors' dividend preferences. On the other hand, Grinstein and Michaely (2005), Denis and Osobov (2008), and Eije and Megginson (2008) find no corroborating evidence, and Fenn and Liang (2001), Kahle (2002), and Brown, Liang and Weisbenner (2007) find evidence that managers' dividend decisions are shaped by their own financial interests. For the reader's convenience, Appendix C provides a review of above studies and is readily available from the authors.

2. Research Method and Samples

2.1. Measuring investors' preference for cash dividends versus stock repurchases

To address our first research question relating to whether the form of cash disbursement to shareholders is relevant to share price, other things held constant, we use a method similar to Baker and Wurgler's (2004a,b) computation of the dividend premium. We compute the natural log difference in the average market-to-book ratio of assets of firms that pay cash dividends regularly and the average market-to-book ratio of assets of firms that repurchase their stock regularly, at the end of each calendar year over the longest period possible. We also compute the log difference in medians in case there are outlier observations.

We need to examine *regularly* cash dividend payers and *regularly* stock repurchasers because firms that employ one-time cash disbursements (such as special dividends or irregular stock repurchases) cannot be used to estimate the payout-form premium (discount). Special dividends or irregular stock repurchases are often the result of nonrecurring accumulation of excess cash, for example due to sale of assets, and have different motivations than regularly-made payouts (see Lie (2000), Jagannathan and Stephens (2003), and Skinner (2008)).[14]

A statistically significant positive (negative) log-difference of market-to-book means (medians) indicates that investors put a stock price premium (discount) on firms that pay cash dividends regularly compared to firms that repurchase their stock regularly (i.e. tax-advantaged capital gains that are discretionarily convertible to cash), unless these two groups of firms exhibit differences in characteristics that have valuation effects. The studies of Jagannathan, Stephens

[14] Lie (2000) reports that excess funds are largely nonrecurring for one-time cash disbursement firms and recurring for regular dividend increase firms. Jagannathan and Stephens (2003) conclude that firms that repurchase most frequently have characteristics similar to firms that routinely increase their dividend payments, and it appears that these firms may be substituting repurchases for dividend increases. On the other hand, infrequent repurchases tend to be used by firms with a potentially high degree of asymmetric information and preceded by a relatively poor market performance. Skinner (2008) finds that earnings drive the level of repurchases over 2 to 3-year windows, which represents evidence that regular stock repurchases are dividend substitutes.

and Weisbach (2000), Grullon and Michaely (2002), and Lee and Suh (2009) indicate fundamental differences between dividend-payers and stock-repurchasers in terms of profitability, cash flow volatility, size, and financial life-cycle.[15] However, these studies do not distinguish between regularly and irregularly repurchasing firms, and as indicated above Jagannathan and Stephens (2003) find the characteristics of firms that repurchase frequently quite different from those of firms that repurchase infrequently and conclude that firms that repurchase most frequently are in many ways similar to dividend-paying firms. Moreover, Skinner (2008) finds the payout-mix of firms that pay dividends and make repurchases unrelated to profitability, variability of profitability, size, growth, market-to-book, or cash; only the financial life-cycle is consistently negatively related to the dividend proportion. He proposes that these variables are designed to capture variation in the level of payout, as opposed to its form.

Nevertheless, we apply below two methods to control for these and other potentially confounding factors as we examine the valuation of firms that pay cash dividends regularly relative to firms that repurchase their stock regularly: (1) the matching method and (2) the multivariate regression analysis. We further examine the robustness of our results by analyzing investors' reaction to special cash dividend declarations over the years.

2.2. Formation of our samples

We obtain our data from the Compustat Industrial Annual database. We define a Compustat firm-year observation as a regularly (an old) cash dividend payer at end of calendar year *t* similar to Baker and Wurgler (2004a), i.e. if it has dividends per share by the ex date in

[15] Jagannathan, Stephens and Weisbach (2000) find firms with a higher standard deviation of cash flows more likely to use repurchases, and dividends and repurchases are used at different places in the business cycle by different types of firms. Grullon and Michaely (2002) find that firms that only repurchase have higher earnings volatility than do firms that only pay dividends. Lee and Suh (2009) find that non-dividend-paying repurchasing firms tend to be smaller, to be at a relatively earlier financial life cycle stage, to be less profitable, and to experience higher profit volatility, as compared to dividend-paying repurchasing firms.

each of the fiscal years that end in calendar years *t* and *t-1*, respectively. We define a Compustat firm-year observation as a stock repurchaser at end of calendar year *t* similar to Fama and French (2008) and Greenwood and Hanson (2012), i.e. if it has a change in the natural log split-adjusted shares outstanding less than -0.5 percent, but we require this change to be over both fiscal years that end in calendar years *t* and *t-1*, respectively, to make it a regularly stock repurchaser. This definition of regularly stock repurchasers is appropriately for our study more conservative than the definitions that Skinner (2008), Jagannathan, Stephens and Weisbach (2000), or Jagannathan and Stephens (2003) use and consistent with the definition of regularly cash-dividend payers.[16]

We exclude: (1) firms with book equity below $250,000 or assets below $500,000; (2) firms that do not have CRSP share codes of 10 or 11; and (3) utilities (SIC codes 4900-4949) and financial firms (SIC codes 6000-6999) (see Fama and French (2001), Baker and Wurgler (2004b), Chetty and Saez (2006), and Skinner (2008)). Finally, we use the remaining Compustat firm-year observations to construct four samples: (1) firms that only pay cash dividends regularly; (2) firms that only repurchase their stock regularly; (3) firms that have at least 80 percent of their total net payout as cash dividend regularly; and (4) firms that have at least 80 percent of their total net payout as stock repurchase regularly. We label the first two as basic samples and the remaining two as expanded samples.

2.3. Our sample demographics and trends in comparison to prior evidence

Table 1 and the associated Figures 1a and 1b present the chronological distributions of our basic and expanded samples of regularly cash-dividend payers and regularly stock repurchasers,

[16] Banyi, Dyl and Kahle (2008) review the various estimates of firms' repurchases of common stock used in earlier studies, and they examine their accuracy. Our composite net issuance measure is appropriately a conservative method to identify repurchasers despite SEOs, stock-financed mergers, and stock compensation to executives. Skinner (2008) defines regular repurchasing firms as ones having positive net repurchases at least every other year. Jagannathan, Stephens and Weisbach (2000) define a firm-year as having an active repurchase program as one in which an open repurchase program is announced during that calendar year or one of the two previous years. Jagannathan and Stephens (2003) define firms that repurchase most frequently as those firms announcing their third or subsequent repurchase programs in five years.

over the period 1965 through 2010. We have an overall total of 44,666 and 45,153 firm-year observations of regularly cash-dividend payers in the basic and expanded samples, respectively. Noticeably much smaller, we have an overall total of 3,426 and 4,237 firm-year observations of regularly stock repurchasers in the basic and expanded samples, respectively. In the following discussion, we relate the chronological distributions of our samples to prior evidence on the changes in the demographics of firms that pay dividends and those that make repurchases since the mid-1960s to illustrate the representative validity of our samples.

Fama and French (2001) report (see Figure 1 on page 7) that the population of dividend payers increases significantly over the period 1966 through 1977, but interestingly it shrinks by more than 50 percent over the period 1978 through 1999 (their last sample year).[17] Skinner (2008) reports a similar decline in the number of U.S. listed firms that only pay dividends over the period 1980 through 2005. Moreover, he reports that the number of firms that pay dividends in at least 11 years during the period 1980-2005 and do not make repurchases is not more than 50 (see Table 2 on page 590).[18] With reference to Panel A in Figures 1a and 1b, we find very similar demographics and trends in our basic and expanded samples of firms that pay cash dividends regularly. The number of observations increases sharply over the period 1965 through 1979. In this peak-year of our sample, there are 1,717 and 1,737 firm-year observations in the basic and expanded samples, respectively. After 1979, these numbers drop to 593 and 599, respectively, in the year 2000, which represents a decline of about 65.5 percent. However, we

[17] AMEX firms are included in CRSP starting in 1963. NASDAQ firms are included in CRSP starting in 1973. The proportion of payers rises from 52.8 percent in 1972 to 66.5 percent in 1978 and then declines sharply after 1978 to reach 20.8 percent in 1999.

[18] All these statistics may be viewed as consistent with the findings of DeAngelo, DeAngelo, and Skinner (2004) pertaining to high and increasing concentration in the supply of dividends which reflects high and increasing concentration in U.S. corporate earnings over the 1980s and 1990s.

find that starting in the year 2000, these numbers stabilize at the same level as the one observed in the late 1960s.

The studies of Grullon and Michaely (2002), Jagannathan and Stephens (2003), and Skinner (2008) show clearly that the share repurchase activity in the U.S.A. first started to emerge as economically significant in the early 1980s, and it grew over the years to the point that in the late 1990s aggregate repurchases outstripped aggregate dividends. Skinner (2008) reports that aggregate net repurchases are consistently in the $30 billion range over 1985 to 1990 before declining to around half that amount in 1991 and 1992, and then rising again thereafter. Chetty and Saez (2006) show that the time series of aggregate share repurchases peaks in 1988, falls after that year to a bottom in 1991-1992, rises sharply to a record peak in 1998, trends downwards until 2003, and then rises again during the period 2003 through 2005 (see Figure 5).

Moreover, Jagannathan and Stephens (2003) report that over time it became relatively common for firms to initiate multiple open-market repurchase programs over a relatively short period of time.[19] However, the distribution of earnings and payouts became dominated by firms that simultaneously pay dividends and make regular stock repurchases (Grullon and Michaely (2002), Skinner (2008)). Skinner (2008) finds that the number of firms that make repurchases in at least 11 years during the period 1980-2005 and do not pay dividends is only 57 (see Table 2).

With reference to Panel B in Figures 1a and 1b, we find again very consistent demographics and trends in our basic and expanded samples of firms that make repurchases regularly. The number of observations before 1971 is very small, but it exhibits a noticeable

[19] They find that in 1986 about 27% of firms announcing open-market repurchase programs had previously initiated similar programs within the last five years; whereas, in 1996, more than 54% of the firms had previously repurchased their stock (and about 27% of the firms had two or more open-market repurchase programs in the prior five years).

upward long-term trend.[20] It rises in the period 1985 through 1989, and then reverses direction and hits a bottom in 1993, a level similar to the observed in the late 1970s and early to middle 1980s. It rises again to reach the highest peak in our entire sample period in the year 2000, with 216 and 270 observations in the basic and expanded samples, respectively. We report another sharp decline to less than half the peak level in the years 2004 and 2005, followed by another climb that continues until the year 2008, and finally a decline in the final years of our period.

With reference to Panel C in Figures 1a and 1b, we observe that the time-series variation in the ratio of firms that make repurchases regularly to total number of the latter and firms that pay cash dividends regularly mimics the one observed in Panel B. There is an upward long-term trend with some periodical fluctuations. Interestingly, however, while the studies of Grullon and Michaely (2002), Jagannathan and Stephens (2003), Chetty and Saez (2006), and Skinner (2008) clearly document that aggregate stock repurchases gained significance over time and the studies of Chetty and Saez (2006) and Skinner (2008) show that they outstripped dividends in the late 1990s, the population of Compustat-firms that only make repurchases regularly never reached in size the population of Compustat-firms that only pay dividends regularly. In fact, its size never exceeds 31 percent of the total in any year during the 1965-2010 period. Evidently, dividends remain the most widely-used method of distributing cash on a regular basis to shareholders.

3. Relative Valuation of Regularly Cash Dividend Payers and Regularly Stock repurchasers Over the 1971-2010 Period

We compare in Table 2 the market-to-book value of regularly cash-dividend payers and regularly own-stock repurchasers (hereafter dividend payers and stock repurchasers), over the period 1971 to 2010, since the number of the latter is very small before 1971. Similar to Baker

[20] For this reason, all following tables and figures use data beginning in 1971.

and Wurgler (2004a) and Fama and French (2001), the market-to-book (M/B) ratio of a firm *j* is the book value of the total assets *minus* the book value of equity *plus* the market value of equity (calendar-year end stock price *times* shares outstanding all *divided by* the book value of the total assets. We present the mean and the median M/B of each sample in each year (as any problem with outlier observations should be less pronounced using the median), and we test the hypothesis that the means (medians) are equal using the two-tailed *t*-test (non-parametric *Wilcoxon-rank-sum* test). Moreover, we include the natural log difference of M/B means and M/B medians. Further, we plot in Figure 2a the relative valuation of dividend payers and stock repurchasers, i.e. the natural log difference of M/B means, over the period 1971 through 2010, in the basic samples and the expanded samples, and we plot in Figure 2b the five-year moving average of the natural log difference of M/B means to more easily identify any long-term trends.

We make several generalizations from Table 2 and the accompanying Figures 2a and 2b. The results pertaining to the basic samples are very similar to the ones pertaining to the expanded samples. Also, the log-difference in M/B sample means series and the log-difference in M/B sample medians series exhibit very similar trends and shifts. In addition, firms that pay cash dividends regularly command a, most-often statistically significant, stock price premium compared to firms that repurchase their stock regularly throughout the 1970s, 1980s, and 1990s. However, during the mid- to late 2000s the relative valuation of these two types of firms reverses as indicated by the statistically significant share price discount for dividend payers compared to stock repurchasers. The valuation premium (discount) of dividend payers over the entire 1971-2010 period varies between a maximum of +48 percent in 1971 (or a maximum of +25 percent in 1974 when we have a larger number of observations) and a minimum of -25 percent in 2006. Moreover, a closer examination indicates several trends: The five-year moving average of the

relative valuation of dividend payers and stock repurchasers exhibits a general negative trend throughout the 1970s; it fluctuates during the 1980s and 1990s around a level that indicates investors' slight preference for dividend payers; it declines sharply throughout the early- to mid-2000s and becomes significantly negative (indicating a premium to stock repurchasers); and finally, it begins changing direction in the late 2000s.

To place changes in these time-series in historical context, we identify the following major historical capital market-related events or trends. First, we count ten U.S. tax-law changes during our study period: in 1976, 1978, 1981, 1986, 1990, 1993, 1997, 2001, 2003, and 2005.[21] Second, we note that the role of institutional investors (some of whom are tax exempt) in the U.S. equity markets gained significance over our forty-year-long study period, while the role of taxable individual investors diminished (see Poterba (2004)).[22] Third, we recognize the following economic downturns or stock market crashes: the 1973-1974 Oil crisis, the 1982 recession, the Black Monday in 1987, the 1990 slow-down, the 1997 Asian financial crisis, the 2000 Dot-com bubble-burst, the September 11th attacks in 2001, the 2002 Dot-com bubble-burst part II, and the 2008 Global financial crisis. Fourth, we note some institutional changes: the transition to one-sixteenth price quotes in 1997, the decimalization of quotes in 2001, the significant decline in brokerage fees over the years and the introduction of more brokerage services, and the breakthroughs in information technology. We perform formal analyses of the effects of these events and trends on the valuation of dividend payers relative to stock-repurchasers in Section 5.

[21] More information about each of these tax-law changes is readily available from the authors.

[22] Poterba (2004) reports that households owned 78.6 percent of the U.S. equities in 1971, but this ownership level decreased steadily to reach about 57 percent in 2003. In contrast, pensions held 11 percent of the U.S. equities in 1971, but this ownership level increased steadily to the level of about 30 percent in 1985 and then stayed just below that level for the remaining years of their study period ending in 2003.

4. Investors' Preference for Dividends Versus Stock Repurchases Over the 1971-2010 Period, Controlling for Potentially Confounding Factors

In this section, we measure the difference between the market valuation of firms that have the same characteristics but use different forms of payout to shareholders, i.e. isolate dividend policy as intended in Miller and Modigliani's (1961) seminal paper. For this purpose, we use a matching procedure to control for the potentially confounding factors indicated in the studies of Jagannathan, Stephens and Weisbach (2000), Grullon and Michaely (2002), and Lee and Suh (2009), namely firm profitability, cash flow volatility, size, and financial life-cycle stage. We also control for the total net payout yield since it has valuation effects (Boudoukh, Michaely, Richardson, and Roberts (2007)) and may be correlated with common risk factors (Chen, Grundy, and Stambaugh (1990), Fama and French (1993), and Naranjo, Nimalendran, and Ryngaert (1998)).

4.1. Measuring investors' payout-form preference after controlling for characteristic differences

We obtain the following data for each firm-year sample observation: (1) firm profitability (E/A), measured similar to Baker and Wurgler (2004b) and Fama and French (2001) (i.e., earnings before extraordinary items *plus* interest expense *plus* income statement deferred taxes *divided* by book assets); (2) cash flow volatility (SRVOL), measured similar to Chay and Suh (2009) (i.e., the standard deviation of monthly stock returns over the most recent two fiscal years; (3) firm size (NYP), measured similar to Baker and Wurgler (2004b) and Fama and French (2001) (i.e., the percent of NYSE firms with the same or lower market capitalization (the natural log of price times shares outstanding at the end of June of year *t*, from CRSP)); (4) financial life-cycle stage (RE/TE), measured similar to DeAngelo, DeAngelo and Stulz (2006), Denis and Osobov (2008), and Skinner (2008) (i.e. the ratio of retained earnings (earned equity) *divided* by the total book value of common stockholders' equity (contributed equity being

positive)); and (5) total net (cash and net repurchases) payout yield (TOTYLD) (i.e., (cash dividends per share by ex date *divided by* calendar-year end stock price) *plus* (1 *minus* the ratio of split-adjusted shares outstanding at *t* to split-adjusted shares outstanding at *t-1*)).

For each calendar year *t* during the period 1971 through 2010, we use specified cut-off points in the NYSE distributions for the following firm attributes: profitability (E/A), cash flow volatility (SRVOL), size (NYP), financial life-cycle stage (RE/TE), and total net payout (cash and net repurchases) yield (TOTYLD), to form groups of homogeneous sample firm-year observations. These homogeneous groups are formed according to the following sets of attributes: (1) E/A, SRVOL, and TOTYLD; (2) E/A, NYP, and TOTYLD; and (3) E/A, RE/TE, and TOTYLD. The categories for E/A, SRVOL, and TOTYLD are NYSE quintiles. Similar to Fama and French (2008), the categories for NYP are: (1) Microcap stocks (below the 20th percentile of NYSE market cap); (2) Small stocks (between the 20th and 50th percentiles); and (3) Big stocks (above the NYSE median). Using the distribution of firms based on the ratio RE/TE, as provided by DeAngelo, DeAngelo and Stulz (2006) (See Table 2 on page 233), we define the financial life-cycle stages as follows: first stage (RE/TE < 0), second stage ($0 \leq$ RE/TE ≤ 0.6), and third stage (RE/TE > 0.6). These definitions of the financial life-cycle stages appear somewhat arbitrary. However, using these cutoff points, the distribution is roughly split as follows: 33.8%, 34.3% and 31.8%, respectively.

Then, for each of the groups (using the first, second, or third set of matching criteria) in calendar year *t*, we compute the average market-to-book (M/B) ratio for each of the sub-groups of dividend payers and stock repurchasers, and the difference between the natural logarithms of these averages. The payout-form premium or discount (FORM-PREM$_t$) in calendar year *t* is the mean (or median) of the natural log differences across all groups. If a group does not have at

least one firm in each of its sub-groups, we exclude it. Following the categories of each matching criterion, we have 125 potential groups using the first set of matching criteria, 75 potential groups using the second set, and 75 potential groups using the third set.

We report in Table 3 the mean and median series for FORM-PREM$_t$ using each set of matching criteria for the period 1971-2010. We present the results pertaining to the basic samples in Panel A and those pertaining to the expanded samples in Panel B. We also show the number of included groups (N) for each year. We plot in Figure 3a the means series of the payout-form premium (discount) in the basic samples, and in Figure 3b the means series in the expanded samples. We plot in Figure 4a the five-year moving average of the means series of the payout-form premium (discount) in the basic samples, and in Figure 4b the five-year moving average in the expanded samples.

Under the efficient and frictionless capital markets' assumption of Miller and Modigliani (1961), the payout-form premium (FORM-PREM$_t$) should be zero. However, since dividends are taxed more heavily than capital gains, on the one hand, and investors may have a preference for cash dividends over capital gains because of psychological (Shefrin and Statman (1984)) or information-asymmetry reasons (Barclay and Smith (1988), Brennan and Thakor (1990)), on the other hand, FORM-PREM$_t$ may deviate from zero. We determine the statistical significance of FORM-PREM$_t$ using the two-tailed *t*-test (based on the cross-sectional standard error) and the non-parametric *Wilcoxon*-test. If FORM-PREM$_t$ is statistically significantly positive (negative) then investors put a stock price premium (discount) on firms that pay cash dividends regularly compared to firms that repurchase their own stock regularly.

With reference to Table 3 and the associated Figures 3a, 3b, 4a, and 4b, we make several observations. The valuations of dividend payers and stock repurchasers converge and diverge

significantly several times over the 1971 through 2010 period. However, Figures 4a and 4b clearly display a strong downward trend in the payout-form premium which becomes negative (discount) in 2006. Dividend payers start out at a price premium that ranges between 0.067 and 0.0159 in 1971. Then, the payout-form premium spikes in 1973 and 1974 with the highest premium observed in 1973 (0.266). After 1974, the premium falls sharply, in relative terms, through 1985. There is a sharp increase in the payout-form premium in 1986 (0.246) followed by a downward decline that bottoms down in 1988 at essentially zero level. During the period 1989 through 2001, the form premium fluctuates between a high of 0.213 in 1992 to a discount of 0.163 in 1999 before declining sharply to a discount of 0.210 in 2007. After 2007, the discount becomes smaller, and in 2010 the payout-form premium / discount becomes essentially 0. In summary, we observe statistically significant and economically large valuation premiums for dividend payers in the years 1973, 1974, 1986 and 1991 (across all samples, all matching methods, and both the means and medians series) and statistically significant and economically large valuation discounts in the years 2006 and 2007.

A comparison between the payout-form premiums estimated using the matching method and the payout-form premium estimated without any controls for potentially confounding factors indicates almost similar trends and inflexion points. In fact, the correlation between these estimates exceeds +0.66. The similarity of the results illustrate the importance of distinguishing between regularly and irregularly stock repurchasing firms and is consistent with Jagannathan and Stephens' (2003) conclusion that "firms that repurchase most frequently are in many ways similar to dividend-paying firms…" (page 80).

4.2. Multivariate regression analysis controlling for other potentially confounding factors

Fama and French (1998) find that the spread of market value over book value of assets of a firm (scaled by book value of assets) is strongly related to earnings, investment, R&D, interest

expense, and dividends. We use these same determinants of firm-value in the following regression model to examine the robustness of our payout-form premium estimates:

$$Ln\,(M_{j,t} / B_{j,t}) = \alpha_0 + \alpha_1 [E_{j,t} / B_{j,t}] + \alpha_2 [(B_{j,t} - B_{j,t-2}) / B_{j,t}] + \alpha_3 [RD_{j,t} / B_{j,t}] + \alpha_4 [I_{j,t} / B_{j,t}]$$
$$+ \alpha_5 [TNP_{j,t} / B_{j,t}] + \alpha_6 [FORMDUM_{j,t} * FORM\text{-}PREM_t]$$
$$+ \beta_2 FDUM_2 + \ldots + \beta_n FDUM_n + \delta_1 YDUM_{1972} + \ldots + \delta_{39} YDUM_{2010} +$$
$$\varepsilon_{j,t}$$

In this model, $Ln\,(M_{j,t} / B_{j,t})$ is the natural logarithm of market-to-book ratio of assets of firm *j* in year *t*, measured similar to Baker and Wurgler (2004a) and Fama and French (2001). $E_{j,t}$ is earnings before extraordinary items *plus* interest expense *plus* income statement deferred taxes and investment tax credit. $RD_{j,t}$ is research and development expenditures. $I_{j,t}$ is interest expense. These variables are measured similar to Fama and French (1998). $TNP_{j,t}$ is total net payout measured as the sum of total cash dividends paid and net stock repurchases (i.e., (the split-adjusted shares outstanding at *t*-1 *minus* the split-adjusted shares outstanding at *t*) *times* average of the fiscal year monthly closing prices).[23] $FORMDUM_{j,t}$ is a binary variable that takes the value of 0 when firm *j* is a regularly stock repurchaser, and the value of +1 when it is a dividend payer. $FORM\text{-}PREM_t$ is the payout-form premium in year *t* (means and medians series).

We apply the Hausman-test to determine whether the random-effects' model is preferred over the fixed-effects' model. The test results reject this null hypothesis at the 1 percent level in all models. We also apply the Wald-test to determine whether there are time-effects. The *F*-statistics are all significant at the 1 percent level in all models. Based on these results, we apply firm and time fixed-effects models with standard errors robust to heteroskedasticiy. The binary

[23] $TNP_{j,t}$ replaces $D_{j,t}$ (i.e., total dividends paid during fiscal year *t*) in the model of Fama and French (1998).

variable FDUM (that takes the value of 1 for firm *j* and 0 otherwise) and the binary variable YDUM (that takes the value of 1 for year *t* and 0 otherwise) represent this model specification.

Table 4 reports the estimates of the coefficient of interest, namely α_6 , and their statistical significance, along with the coefficients of determination (R^2) and the number of observations (N). We note that all the independent variables in the model $E_{j,t}$ / $B_{j,t}$, ($B_{j,t}$ – $B_{j,t-2}$) / $B_{j,t}$, $RD_{j,t}$ / $B_{j,t}$, $I_{j,t}$ / $B_{j,t}$, and $TNP_{j,t}$ / $B_{j,t}$ are found statistically significant at conventional levels (the complete output is readily available upon request). The coefficients of determination all exceed 40 percent and the estimates of the coefficient α_6 are all statistically significant at the one percent level. Therefore, we find that the payout-form premium (discount) remains a significant determinant of firm-value despite accounting for these additional determinants of firm value.

However, for a given firm, as the payout-form premium FORM-PREM$_t$ increases (decreases) *across time* by one percent, being a regularly cash-dividend payer (as opposed to a stock repurchaser) increases (reduces) its market value somewhere between 0.22 and 0.73 percent, other things constant. As these estimates are less than one percent, the other firm value determinants included in the model are capturing confounding effects that the matching method apparently did not filter out. The payout-form premium (discount) measures obtained from the matching method and using the basic samples provide coefficients that are closest to one.

4.3. Robustness of above estimates of the payout-form premium using a different sample

In this section, we examine the robustness of our results from the above samples of regularly cash dividend payers and regularly stock repurchasers by using a sample of declarations of extraordinary / special cash dividends and the short-term event-study method.

Our rationale for using a sample of extraordinary / special cash dividends is that when managers declare them they disclose two simultaneously-made executive decisions: (1) the

decision to make a one-time distribution to shareholders; and (2) the decision on its form, i.e. an extraordinary / special cash dividend instead of an irregular stock repurchase. Intuition suggests that if investors' preference for one form of payout over another is time-varying, then it must be reflected in their immediate response to the declaration of the extraordinary / special cash dividend. Specifically, at times of investor preference for cash-dividends over stock-repurchases, the bang-for-the-buck (i.e. the two-day declaration-period abnormal stock return divided by the dollar amount of the extraordinary / special dividend) should be higher than at other times.

Using the event-study method has its advantages as well. The abnormal stock return at the declaration is not affected by the return model as the expected return over the event-window is almost zero. Additionally, the empirical evidence indicates that investors' initial stock price response to the declaration of extraordinary / special cash dividends is efficient (see Chou, Liu and Zantout (2009)).[24] In contrast, the studies of Ikenberry, Lakonishok, and Vermaelen (1995, 2000) and Grullon and Michaely (2004) on stock repurchases find a significant under-reaction.

We search for declared extraordinary / special U.S. cash dividends (i.e., distribution codes 1272, 1273, 1274 and 1278) during the period from January 1971 through December 2010 using the database of the Center for Research in Security Prices (CRSP). For consistency with the screening criteria we use above to identify firms and then compute the dividend-form premium (discount), we exclude declarations made by: (1) firms with book equity below $250,000 or assets below $500,000; (2) firms that do not have CRSP share codes of 10 or 11; and (3) utilities (SIC codes 4900-4949) and financial firms (SIC codes 6000-6999). In addition, since we need the declaration to be unexpected (i.e. not already partially reflected in the market value of the firm), we exclude all such declarations that are preceded during a period of three years by

[24] Using a sample between 1926 and 2001, Chou, Liu and Zantout (2009) find no robust long-term abnormal stock returns following the unexpected declaration of extraordinary / special cash dividends.

another similar declaration by the same firm. These screening criteria result in a sample of 1482 events that are made in the period from 1971 through 2010 by NYSE, Amex and Nasdaq firms.

We apply the standard short-term event-study method. We use the market model, daily return data, the equally-weighted CRSP index, the OLS procedure, and a parameter estimation period from day -150 through day -31 relative to the declaration date to compute the two-day declaration-period abnormal return for each sample firm. To control for differences in volatility across firms and time, similar to Baker and Wurgler (2004a), we also scale each firm's two-day abnormal return by the square root of two times the standard deviation of its daily excess returns (measured from day -150 through day -31 before the declaration date).

Next, we compute two measures of investors' response at each sample firm *j*: (1) the bang-for-the-buck ($AR_{j,t}$ / $DIV_{j,t}$) as its two-day declaration period abnormal stock return divided by the declared extraordinary / special dividend; and (2) the standardized bang-for-the-buck ($SAR_{j,t}$ / $DIV_{j,t}$) as its two-day declaration period standardized abnormal stock return divided by the declared extraordinary / special dividend. Finally, we compute the means of $AR_{j,t}$ / $DIV_{j,t}$ and $SAR_{j,t}$ / $DIV_{j,t}$ for each year in the period 1971 through 2010. We determine the statistical significance of investors' mean response in a calendar year *t* by performing the *t*-test (using the cross-sectional standard error) and the non-parametric *Wilcoxon*-test.

We present in Table 5 the chronological distribution of our sample. We also present the time-series of the mean bang-for-the-buck and the mean standardized bang-for-the-buck. We observe significant variation in these measures of investors' response over the years. They start positive and significant at conventional levels in the 1970s. They lose statistical significance during most years in the period from early 1980s through early 2000s. They are again positive

and statistically significant in the year 2002, but they turn negative and statistically significant in 2004. They exhibit continuing fluctuations during the remaining sample period.

We examine in Table 6 the correlation coefficients between the time-series payout-form premium (discount) estimates and the above measures of investors' response to extraordinary / special cash dividend declarations. We report Pearson's correlation coefficients, Spearman's rank correlation coefficients, and the results of the augmented Dickey-Fuller unit root tests. The null hypothesis tested for the correlation coefficients is that there is no correlation. The null hypothesis of the unit root tests is that there is a unit root (i.e. the series is non-stationary).

The results in Table 6 clearly indicate that these null hypotheses are rejected at conventional levels. The non-spurious correlation coefficients are all positive and statistically significant. They range between a minimum of +0.274 and a maximum of +0.493. These results provide an out-of-sample validation of the robustness of our proxies for investors' time-varying preference for cash dividends versus stock repurchases. Discovering a systematic explanation for the time-series variation in the payout-form premium (discount) is the important next question.

5. Are Changes in Investors' Payout-form Preference Related to Raxes?

A possible explanation for the changes in investors' payout-form preference over the years is changes in the relative tax burden on dividends and capital gains. As Sialm (2009) points out, marginal tax rates on dividends and long-term capital gains fluctuated considerably over the years, with dividend tax rates generally much higher and more volatile than capital gain tax rates.

Following Miller and Modigliani's (1961) argument, we expect the time-series change in the valuation of dividend payers relative to the valuation of stock repurchasers to be negatively related to the relative tax burden on dividends and long-term capital gains. Alternatively, Miller

and Scholes (1978) hypothesize that taxes can be avoided and that the marginal investor is tax-exempt; accordingly, the relative valuation of cash dividend payers and stock repurchasers should not be related to the differential tax burden on dividends and capital gains. We use regression analysis of the above payout-form premium (FORM-PREM$_t$) estimates to determine empirically their relation to the differential tax-burden on dividends and long-term capital gains.

However, we count four issues relating to the measurement of the relative tax burden on dividends and long-term capital gains (see also Sialm (2009)). First, as pointed out in Section 3, shares of corporate equity held by different investor groups with different tax status changed over the years. The role of institutional investors (some of whom are tax exempt) in the U.S. equity markets has been increasingly gaining significance (see Poterba (2004)) while the role of taxable individual investors has been diminishing. Consequently, even in the absence of a change in the differential tax-burden on dividends and long-term capital gains, the latter may have currently a less significant impact on the relative valuation of cash-dividend paying firms and stock repurchasing firms than in earlier years. Second, the equilibrium share value of the firm is determined by the marginal investor. Therefore, an assumption has to be made about the marginal investor and the relevant marginal tax rates. Third, dividend distributions are realized gains for tax purposes; whereas, only a portion of capital gains are usually realized. Therefore, the effective differential tax burden on dividends and long-term capital gains depends on the assumption pertaining to capital gains realization behavior. Fourth, investors might not know their applicable tax information at the beginning of the year and use instead the information of the previous year. For these reasons and to ensure the robustness of any conclusion from our results, we use four alternative definitions of the effective differential tax-burden on dividends and capital gains, both as concurrent and one-year-lagged explanatory variables.

Our first definition of the differential tax burden (DIFF-TAX1) is the one used by Poterba (2004). This definition posits that each (household, corporate, or pension) investor's tax parameters affect the aggregate tax preference for dividends versus capital gains (i.e., stock repurchases) in proportion to the investor's ownership of corporate stock. Therefore, if $\tau_{div,h}$ and $\tau_{cg,h}$ denote the marginal tax rates on dividends and long-term capital gains, respectively, for investor *h*, and $w_{h,t}$ denotes the share of corporate equity owned by investor *h* at time *t*, then the aggregate weighted-average dividend tax preference parameter is $\Sigma\, w_{h,t} * [(1-\tau_{div,h,t}) / (1-\tau_{cg,h,t})]$. Accordingly, DIFF-TAX1 captures the impact of both changing marginal tax rates as well as shifting ownership patterns among different shareholder groups over time. Also, as this measure of the differential tax-burden is essentially the after-tax income from dividends relative to after-tax long-term capital gain, we expect its coefficient to be either positive following Miller and Modigliani (1961) or insignificant following Miller and Scholes (1978).

We replicate Poterba's (2004) computations and extend the period to 2010. Specifically, we obtain the total ownership shares of households, corporations, and pensions using Tables L.213 and L.214 of the *Flow of Funds Accounts of the United States*. We obtain the tax data using Tables 3.2 and 3.3 of the *National Income and Product Accounts* and the website of the National Bureau of Economic Research and the TAXSIM model.[25] We compute the tax parameters for households and corporations, and the aggregate tax parameter considering the ownership shares of households, corporations, and pensions. Pensions are assumed to face zero dividend and capital gains taxes, and the computation of the marginal tax rate on capital gains for households assumes that the effective accrual rate is 0.25 *times* the statutory rate.[26]

[25] For further details about the methodology of TAXSIM model see http://www.nber.org/taxsim/marginal-tax-rates.
[26] This assumption is a reasonable approximation. Using the average propensities to realize capital gains over his sample period according to the U.S. Internal Revenue Service, Sialm (2009) estimates that the ratio between the

Our second definition of the differential tax burden (DIFF-TAX2) is the aggregate tax parameter for taxpayers only, i.e. households and corporations. Our third definition of the differential tax burden (DIFF-TAX3) is the tax parameter for households only. It ignores changes in equity ownership, it includes U.S. Federal & State taxes, it assumes the marginal investor faces a tax rate on dividends and capital gains equal to the tax rate of the average investor, and it assumes a 25 percent annual capital gain realization. Our fourth definition (DIFF-TAX4) is similar to DIFF-TAX3 but it assumes investors completely avoid realizing capital gains.

Other than the potential tax effect, we also recognize the opportunity to further test the validity and robustness of our estimates of the payout-from premium by including in our regressions the excess stock market return (MARKET_t measured as stock market return minus one-year U.S. treasury rate over year t). A priori, the relative valuation of dividend payers and stock repurchasers should not be affected by the business cycle, particularly after using the matching procedure above. We obtain the data from the website of Professor Kenneth French.

We further recognize the need to include a linear time trend (TREND_t from 1 to 40) to capture the potential effects of notable general trends over our forty-year-long sample period that relate to information asymmetry (Barclay and Smith (1998)), information collection costs (Brennan and Thakor (1990)), and direct and indirect costs of home-making dividends, and therefore may influence investors' payout-form preference. These trends include: (1) Improvements in corporate disclosures; (2) Declining information search, collection and analysis costs due to major improvements in information technology; (3) Decreasing brokerage or underwriting fees in stock repurchases due to increased competition; or (4) Falling direct and indirect costs of home-making dividends due to the emergence of discount brokers, the spread of

effective accrual rate of capital gains and the statutory rate is 26.6 percent, which is very close to the 25 percent used by Poterba (2004).

online trading with a flat fee per transaction, the advent of many new stockbroker services such as checking accounts, the increased trading volume, and the notable transition to one-sixteenth price quotes in 1997 and then the decimalization of price quotes in 2001.

Table 7 presents the results of the following regression model:

$$\text{FORM-PREM}_t = \phi_0 + \phi_1 \text{ DIFF-TAX}_{t-1} + \phi_2 \text{ MARKET}_t + \phi_3 \text{ TREND}_t + \varepsilon_{j,t}$$

The results of the model using concurrent observations for the tax variable (DIFF-TAX$_t$) are generally similar to the ones reported below and are readily available from the authors. The *t*-statistics we use to determine the significance of the ordinary-least-squares estimated parameters are robust to heteroskedasticity and serial correlation up to four lags (Newey and West (1987)).

We find that all the estimated values for the coefficient ϕ_1 of the relative tax-burden parameter DIFF-TAX$_{t-1}$ are consistently positive across different measurements of the payout-form premium FORM-PREM$_t$ and in the basic and expanded samples. However, they range between +0.259 and +2.092, and their statistical significance is not robust. We observe that their statistical significance is more robust in the expanded samples in which we have a larger number of observations (and more groups following the matching procedure). These results lead us to conclude that investors' time-varying payout-form preference is generally statistically related to the differential tax-burden on dividends and long-term capital gains. This conclusion is consistent with the findings of Sialm (2009) on the time-series relation between effective tax burden on equity securities and the aggregate equity valuation levels over the period 1913-2006. The marginal investor is evidently not tax-exempt as Miller and Scholes (1978) propose.

Our time-series results indicate that if the Federal marginal tax rate on dividend income for households were to increase by one percent from its current level, other things held constant, the value of regularly cash-dividend payers relative to the value of regularly stock repurchasers can

fall by as much as 2.5 percent. Using the middle point of the range of estimates of ϕ_1, the fall is about one percent. These results are economically significant.

We also find that the estimates for the coefficient ϕ_2 of the excess stock market return variable MARKET_t are usually statistically insignificant and they change signs. These results lead us to conclude that there is no evidence of any relation between our estimates of investors' payout-form preference and this proxy for the business cycle, which constitutes another validation for our payout-form premium (discount) estimates.

Finally, we find that all the estimated values for the coefficient ϕ_3 of the time trend variable TREND_t are consistently negative and statistically significant at conventional levels across different measurements of the payout-form premium FORM-PREM_t and in the basic and expanded samples. They range between -0.021 and -0.006 when FORM-PREM_t without controls for possibly confounding factors is included, or between -0.010 and -0.006 when only the results for FORM-PREM_t obtained from the matching method are considered. Following these results, if the point estimate for ϕ_3 is around -0.007, then over our forty-year-long sample period, the cumulative effect is a decline in the value of dividend payers relative to stock repurchasers of about 27 percent. Assuming historical changes in the above listed market frictions are captured by the negative trend, these changes are economically significant.

6. Conclusion

We examine whether the form of U.S. corporate cash distribution matters to shareholders and whether personal taxes have a role in that regard. We report robust results that show the form of cash payout to shareholders in the U.S.A. often relevant to share price and in different directions at different times. The time-series variation in investors' payout-form preference is

generally significantly related to the differential tax-burden on dividends and long-term capital gains. It also exhibits a significant negative long-term trend over our 1971-2010 study period. This trend may be capturing the diminishing of frictions often used to explain the supply of corporate cash dividends instead of stock repurchases.

Our evidence is consistent with the investor-rationality assumption underlying Miller and Modigliani's (1961) theory and indicates that the tax treatment of dividends relative to capital gains does affect the firm's cost of capital. It also suggests that management's subordination of investors' tax-related interests as indicated in the studies of Brav, Graham, Harvey, and Michaely (2005 and 2008) can lead to a sub-optimal corporate payout policy.

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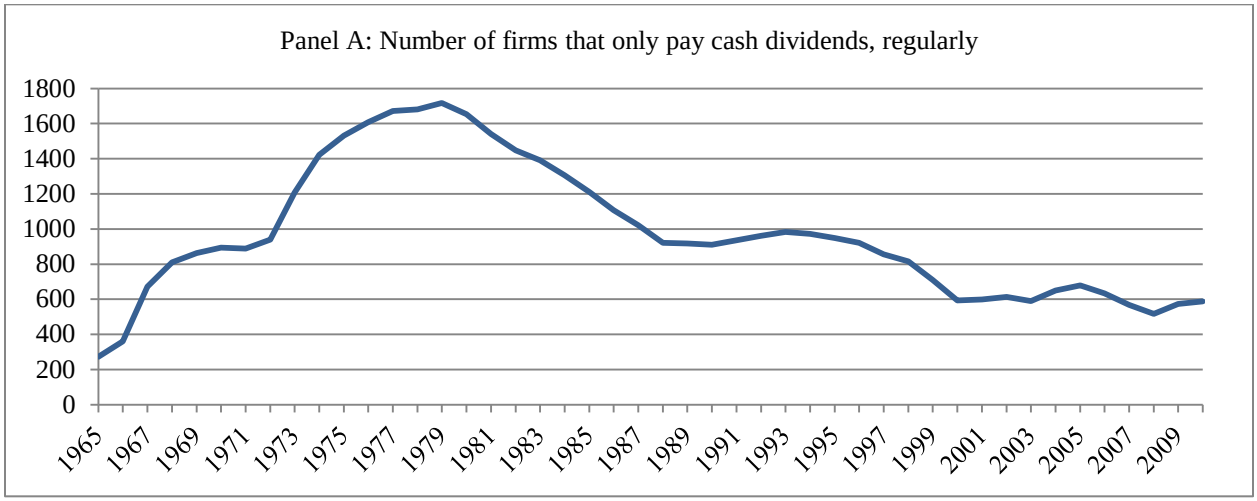
Table 1
The samples of regularly cash-dividend payers and regularly own-stock repurchasers, 1965 to 2010

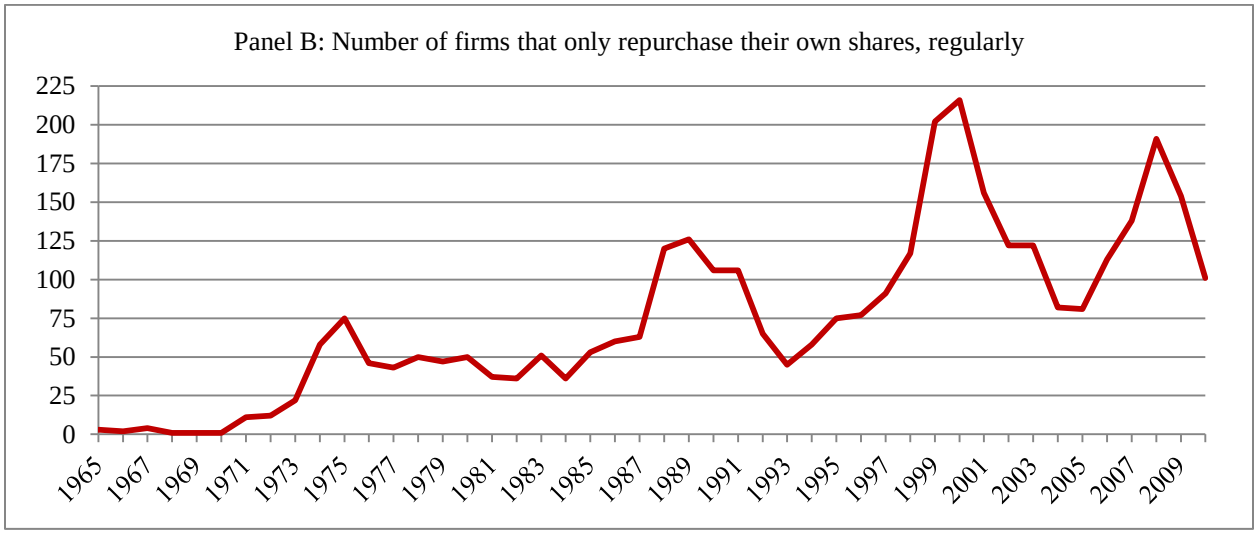
This table provides the chronological listing of the samples. A Compustat firm-year observation is classified as a regularly cash-dividend payer at end of calendar year *t* if it paid dividends in each of the fiscal years that end in calendar years *t* and *t-1*, similar to Baker and Wurgler (2004a). A Compustat firm-year observation is classified as a regularly stock repurchaser at end of calendar year *t* if it had a change in log split-adjusted shares outstanding from Compustat less than -0.5 percent, similar to Fama and French (2008) and Greenwood and Hanson (2012), over each of the fiscal years that end in calendar years *t* and *t-1*. Firms with book equity below $250,000 or assets below $500,000, firms that do not have CRSP share codes of 10 or 11, and utilities or financial firms are all excluded, similar to Fama and French (2001) and Baker and Wurgler (2004b). The resulting regularly cash-dividend payers and regularly stock repurchasers are screened further by classifying them into four samples, as shown below: (1) firms that only pay cash dividends (no stock repurchases), regularly; (2) firms that only repurchase their own shares (no cash dividends), regularly; (3) firms that payout regularly and 80 percent or more of their total net (cash and net stock repurchase) payout yield is in the form of cash dividends in each of the fiscal years that end in calendar years *t* and *t-1*; and (4) firms that payout regularly and 80 percent or more of their total net (cash and net stock repurchase) payout yield is in the form of repurchase of their own stock in each of the fiscal years that end in calendar years *t* and *t-1*. The total net payout yield of firm *j* in calendar year *t* is the sum of the cash dividend yield (cash dividends per share by ex date *divided by* calendar-year end stock price) *plus* the stock repurchase yield (1 *minus* the ratio of split-adjusted shares outstanding at *t* to split-adjusted shares outstanding at *t-1*). A firm-year observation that does not fit into any of these four classifications is excluded.

Calendar year	Basic samples (using a strict definition of cash-dividend payers and stock repurchasers)			Expanded samples (using a more relaxed definition of cash-dividend payers and stock repurchasers)		
	Number of firms that only pay cash dividends, regularly	Number of firms that only repurchase their own shares, regularly	Ratio of regularly repurchasers to total of both samples	Number of firms that predominantly or only pay cash dividends, regularly	Number of firms that predominantly or only repurchase their own shares, regularly	Ratio of regularly repurchasers to total of both samples
1965	272	3	0.011	273	4	0.014
1966	361	2	0.006	370	2	0.005
1967	671	4	0.006	673	4	0.006
1968	810	1	0.001	810	1	0.001
1969	863	1	0.001	869	1	0.001
1970	893	1	0.001	906	2	0.002
1971	889	11	0.012	895	11	0.012
1972	940	12	0.013	946	12	0.013
1973	1,208	22	0.018	1,222	23	0.018
1974	1,422	58	0.039	1,475	60	0.039
1975	1,532	75	0.047	1,566	81	0.049
1976	1,607	46	0.028	1,635	55	0.033
1977	1,671	43	0.025	1,688	55	0.032
1978	1,681	50	0.029	1,696	62	0.035
1979	1,717	47	0.027	1,737	59	0.033
1980	1,653	50	0.029	1,672	58	0.034
1981	1,540	37	0.023	1,567	44	0.027
1982	1,447	36	0.024	1,456	51	0.034
1983	1,391	51	0.035	1,397	63	0.043
1984	1,305	36	0.027	1,312	48	0.035

1985	1,211	53	0.042	1,215	68	0.053
1986	1,107	60	0.051	1,116	84	0.070
1987	1,022	63	0.058	1,030	81	0.073
1988	922	120	0.115	930	139	0.130
1989	917	126	0.121	938	146	0.135
1990	911	106	0.104	921	128	0.122
1991	935	106	0.102	951	117	0.110
1992	962	65	0.063	969	75	0.072
1993	983	45	0.044	990	53	0.051
1994	972	58	0.056	977	68	0.065
1995	949	75	0.073	956	96	0.091
1996	922	77	0.077	923	101	0.099
1997	855	91	0.096	866	123	0.124
1998	816	117	0.125	820	151	0.156
1999	709	202	0.222	714	245	0.255
2000	593	216	0.267	599	270	0.311
2001	599	156	0.207	615	192	0.238
2002	613	122	0.166	619	138	0.182
2003	589	122	0.172	591	147	0.199
2004	649	82	0.112	652	107	0.141
2005	678	81	0.107	680	117	0.147
2006	633	113	0.151	638	158	0.198
2007	567	138	0.196	571	216	0.274
2008	517	191	0.270	531	239	0.310
2009	574	154	0.212	582	166	0.222
2010	588	101	0.147	594	116	0.163
Total for period 1971-2010	40,796	3,414		41,252	4,223	
Total for period 1965-2010	44,666	3,426		45,153	4,237	

Figure 1a: Basic samples





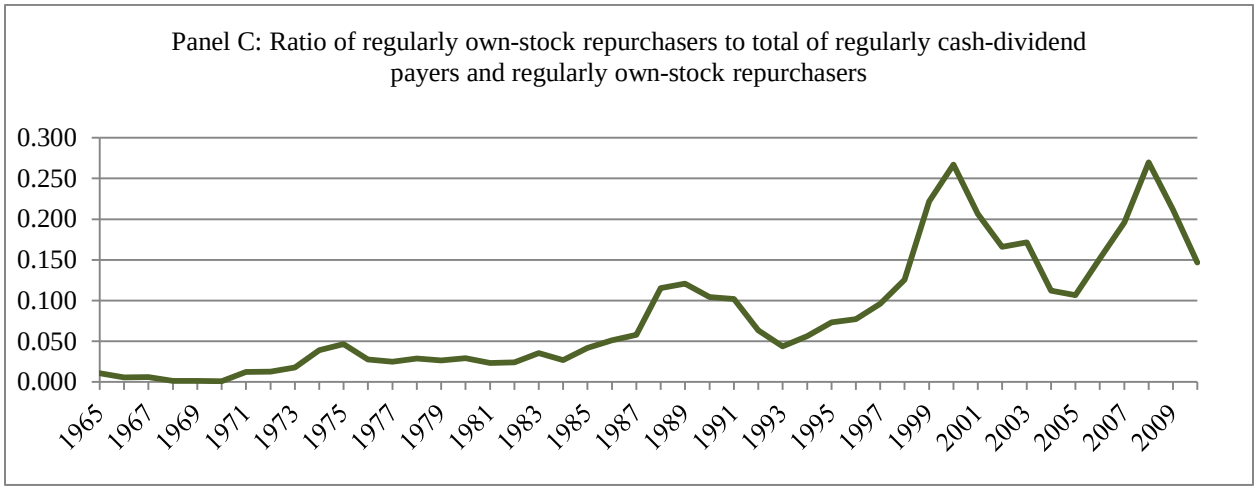
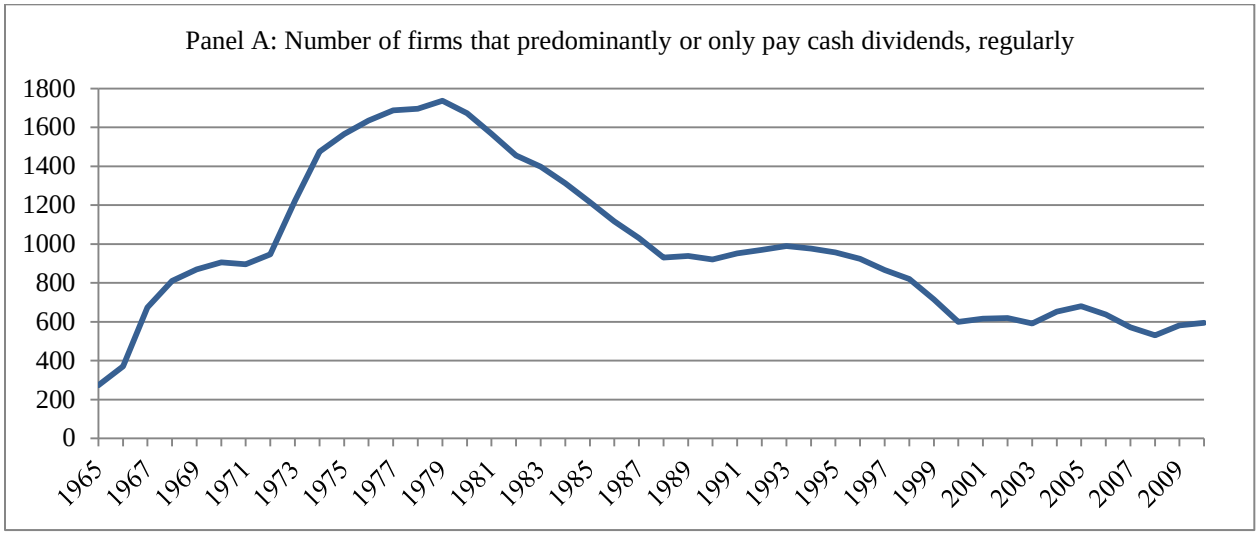
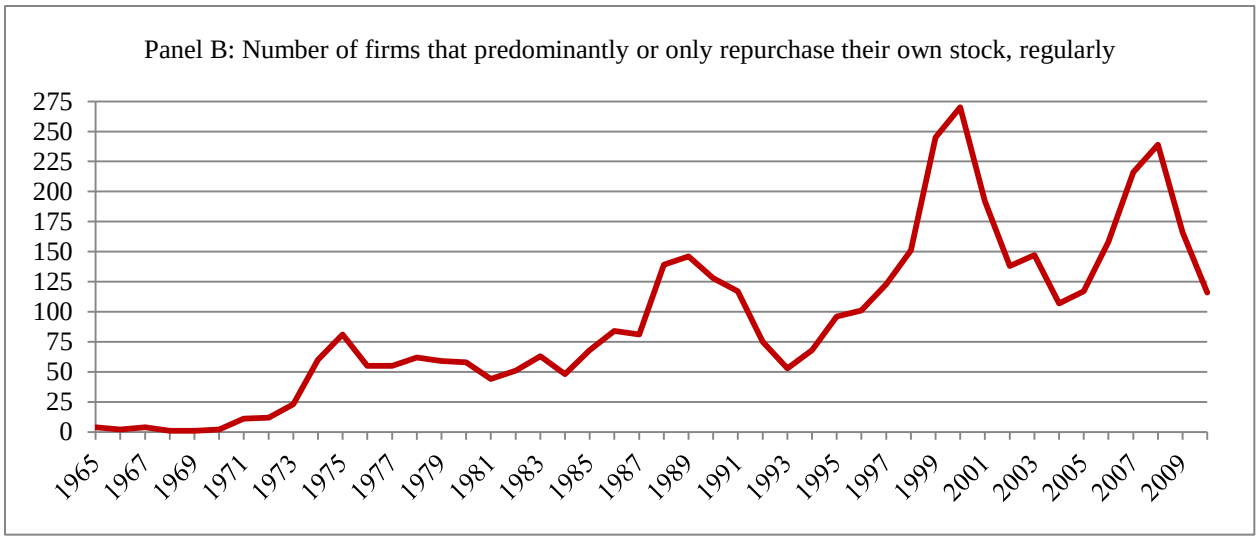


Figure 1b: Expanded samples





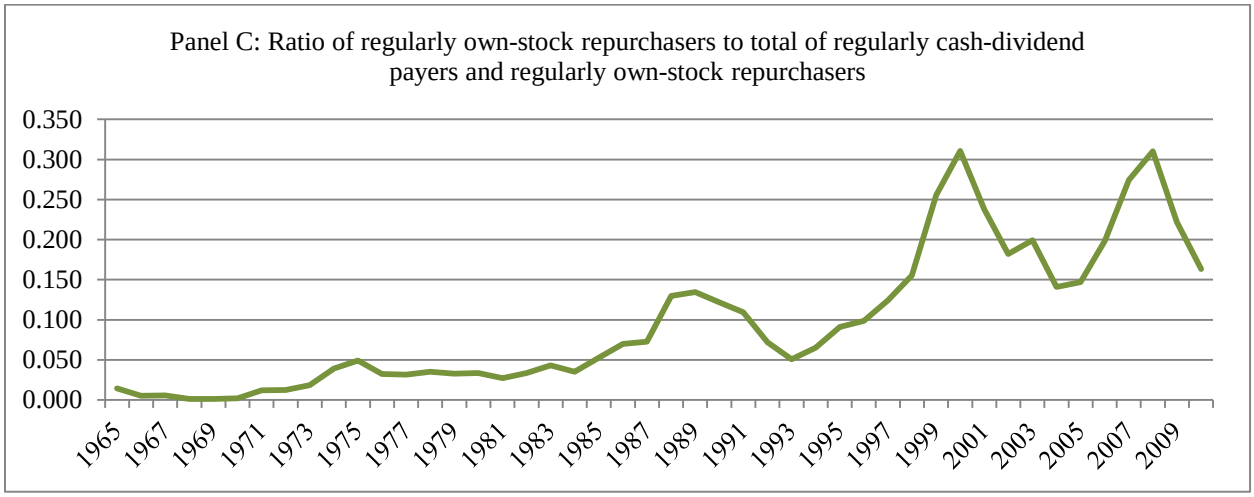


Table 2
The relative valuation of regularly cash-dividend payers and regularly own-stock repurchasers, 1971 to 2010

This table compares the market-to-book value of regularly cash-dividend payers and regularly stock repurchasers, over the period 1971 to 2010. Similar to Baker and Wurgler (2004a) and Fama and French (2001), the market-to-book (M/B) ratio of a firm *j* is the book value of the total assets *minus* the book value of equity *plus* the market value of equity (calendar-year end stock price *times* shares outstanding) all *divided by* the book value of the total assets. The null hypothesis tested is that the means (medians) are equal. ***, ** and * (+++, ++ and +) indicate rejection of the null hypothesis at the 1, 5 and 10 percent levels, respectively, in a two-tailed *t*-test (non-parametric *Wilcoxon-rank-sum* test).

Calendar year	Basic samples						Expanded samples					
	Mean (median) market-to-book value (M/B) of		Natural log difference of M/B means	Natural log difference of M/B medians	Statistical significance of difference in means (medians)		Mean (median) market-to-book value (M/B) of		Natural log difference of M/B means	Natural log difference of M/B medians	Statistical significance of difference in means (medians)	
	Regularly cash-dividend payers	Regularly own-stock repurchasers					Regularly cash-dividend payers	Regularly own-stock repurchasers				
1971	1.596 (1.191)	0.986 (0.954)	0.482	0.222		+++	1.592 (1.188)	0.986 (0.954)	0.479	0.219		++
1972	1.663 (1.186)	1.030 (1.012)	0.479	0.159		++	1.658 (1.184)	1.030 (1.012)	0.476	0.157		++
1973	1.264 (0.912)	0.800 (0.802)	0.457	0.129	**	+++	1.260 (0.909)	0.800 (0.787)	0.454	0.144	**	+++
1974	0.944 (0.800)	0.732 (0.724)	0.255	0.100	***	+++	0.937 (0.797)	0.731 (0.724)	0.248	0.096	***	+++
1975	1.014 (0.858)	0.792 (0.757)	0.247	0.125	***	+++	1.009 (0.855)	0.793 (0.757)	0.241	0.122	***	+++
1976	1.106 (0.959)	0.801 (0.786)	0.323	0.199	***	+++	1.103 (0.957)	0.823 (0.825)	0.292	0.148	***	+++
1977	1.089 (0.968)	0.872 (0.819)	0.222	0.167	***	+++	1.086 (0.965)	0.917 (0.836)	0.169	0.143	***	+++
1978	1.080 (0.961)	0.886 (0.839)	0.198	0.136	**	+++	1.078 (0.959)	0.922 (0.855)	0.157	0.115	**	+++
1979	1.154 (0.993)	0.925 (0.852)	0.221	0.153	***	+++	1.152 (0.992)	1.018 (0.868)	0.123	0.134	*	+++
1980	1.269 (1.039)	1.199 (0.896)	0.057	0.148		+++	1.266 (1.039)	1.204 (0.895)	0.051	0.149		+++
1981	1.205 (1.010)	1.120 (0.863)	0.073	0.157		+++	1.200 (1.008)	1.158 (0.829)	0.036	0.196		+++
1982	1.263 (1.077)	1.004 (0.896)	0.230	0.184	**	+++	1.260 (1.073)	1.102 (0.917)	0.134	0.157		+++
1983	1.397 (1.204)	1.063 (0.973)	0.273	0.213	***	+++	1.397 (1.204)	1.092 (0.985)	0.246	0.201	***	+++
1984	1.330 (1.161)	1.136 (0.986)	0.158	0.163	*	+++	1.328 (1.159)	1.188 (1.000)	0.112	0.148		+++
1985	1.421 (1.230)	1.466 (1.176)	-0.032	0.045			1.420 (1.230)	1.425 (1.155)	-0.003	0.063		+
1986	1.502 (1.274)	1.087 (1.026)	0.324	0.216	***	+++	1.500 (1.272)	1.139 (1.106)	0.275	0.140	***	+++
1987	1.436 (1.210)	1.077 (0.964)	0.287	0.227	***	+++	1.432 (1.209)	1.133 (1.038)	0.235	0.152	***	+++
1988	1.458 (1.254)	1.196 (1.018)	0.198	0.208	***	+++	1.455 (1.251)	1.218 (1.016)	0.178	0.208	***	+++
1989	1.538 (1.299)	1.152 (0.984)	0.289	0.278	***	+++	1.537 (1.297)	1.204 (1.019)	0.244	0.241	***	+++

1990	1.401 (1.178)	1.018 (0.916)	0.319	0.252	***	+++	1.396 (1.176)	1.074 (0.945)	0.262	0.219	***	+++
1991	1.565 (1.248)	1.112 (0.942)	0.341	0.281	***	+++	1.560 (1.248)	1.130 (0.958)	0.323	0.264	***	+++
1992	1.689 (1.368)	1.526 (1.077)	0.102	0.239		+++	1.687 (1.368)	1.502 (1.082)	0.116	0.235		+++
1993	1.726 (1.465)	1.218 (1.143)	0.349	0.248	***	+++	1.724 (1.464)	1.312 (1.173)	0.273	0.222	***	+++
1994	1.598 (1.363)	1.318 (1.056)	0.193	0.255	**	+++	1.601 (1.363)	1.369 (1.120)	0.157	0.196	**	+++
1995	1.661 (1.396)	1.508 (1.147)	0.096	0.196		+++	1.661 (1.396)	1.625 (1.237)	0.022	0.121		++
1996	1.729 (1.483)	1.580 (1.213)	0.090	0.201		+++	1.729 (1.481)	1.647 (1.331)	0.048	0.107		++
1997	1.861 (1.539)	1.585 (1.355)	0.161	0.127	**	+++	1.857 (1.533)	1.797 (1.574)	0.033	-0.026		
1998	1.875 (1.461)	1.746 (1.250)	0.071	0.156		+++	1.874 (1.461)	1.902 (1.326)	-0.015	0.097		+
1999	1.756 (1.324)	1.525 (1.089)	0.141	0.195	*	+++	1.752 (1.323)	1.666 (1.157)	0.050	0.134		+++
2000	1.755 (1.279)	1.405 (0.973)	0.222	0.273	***	+++	1.749 (1.277)	1.483 (1.040)	0.164	0.205	**	+++
2001	1.678 (1.315)	1.247 (0.992)	0.297	0.282	***	+++	1.679 (1.314)	1.357 (1.092)	0.213	0.185	***	+++
2002	1.573 (1.320)	1.340 (1.106)	0.160	0.177	***	+++	1.569 (1.319)	1.440 (1.214)	0.086	0.083	*	+++
2003	1.685 (1.451)	1.921 (1.561)	-0.131	-0.073	**		1.683 (1.451)	2.013 (1.631)	-0.179	-0.117	***	+
2004	1.874 (1.569)	1.924 (1.647)	-0.026	-0.049			1.876 (1.571)	2.028 (1.712)	-0.078	-0.086		+
2005	1.885 (1.562)	2.211 (1.782)	-0.160	-0.132	**	++	1.885 (1.562)	2.176 (1.862)	-0.144	-0.176	***	+++
2006	1.861 (1.592)	2.309 (2.017)	-0.216	-0.237	***	+++	1.862 (1.593)	2.391 (2.055)	-0.250	-0.255	***	+++
2007	1.775 (1.500)	2.120 (1.739)	-0.178	-0.148	***	+++	1.774 (1.500)	2.178 (1.883)	-0.206	-0.227	***	+++
2008	1.393 (1.182)	1.518 (1.192)	-0.085	-0.008	*		1.385 (1.174)	1.571 (1.294)	-0.126	-0.097	***	+++
2009	1.590 (1.363)	1.727 (1.497)	-0.083	-0.094	*		1.590 (1.364)	1.741 (1.497)	-0.091	-0.093	**	
2010	1.777 (1.538)	1.853 (1.562)	-0.042	-0.015			1.774 (1.538)	1.871 (1.606)	-0.053	-0.043		

Figure 2a
The relative valuation of regularly cash-dividend payers and regularly own-stock repurchasers, 1971 to 2010

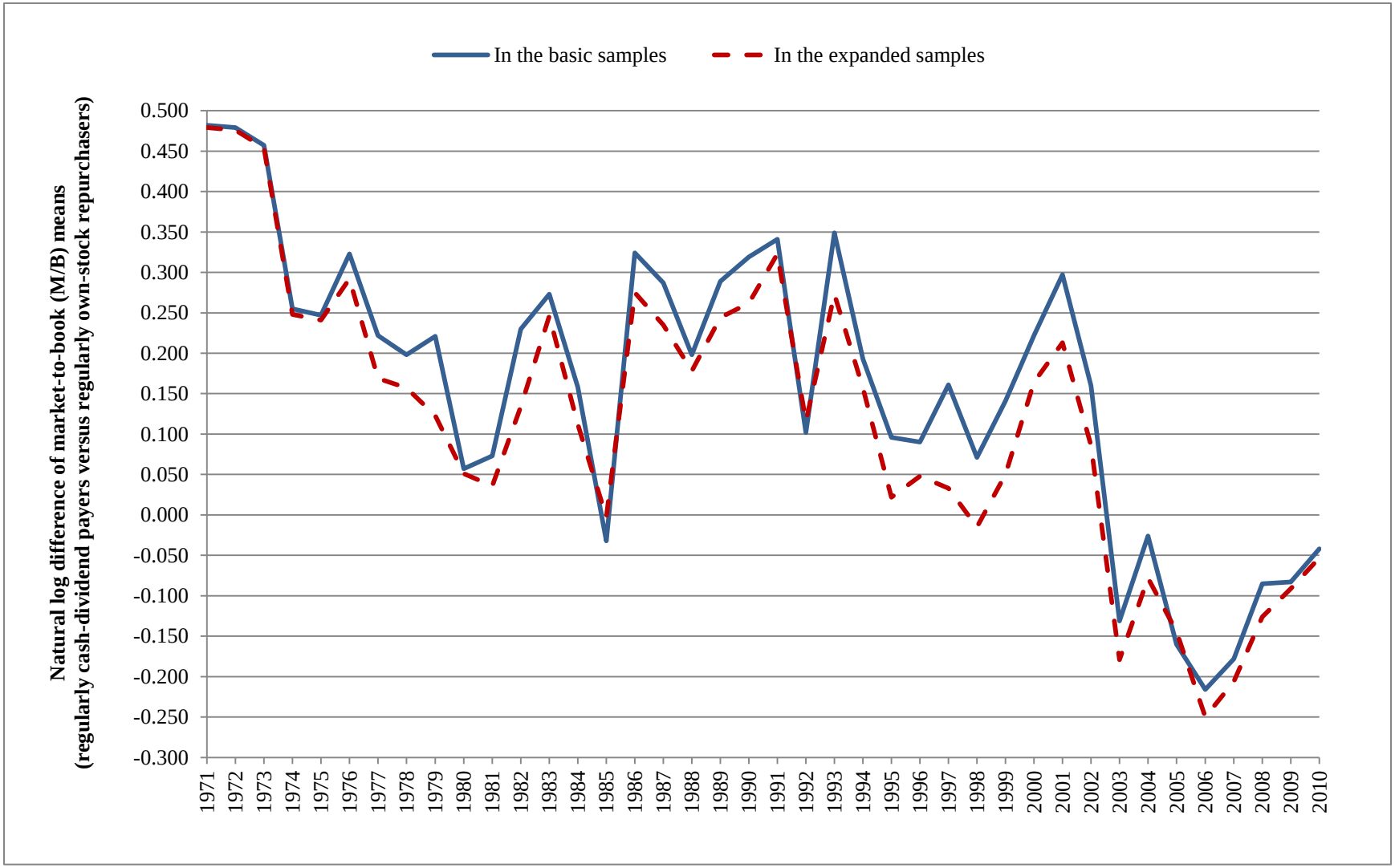


Figure 2b
The five-year moving average of the relative valuation of regularly cash-dividend payers and regularly own-stock repurchasers, 1971 to 2010

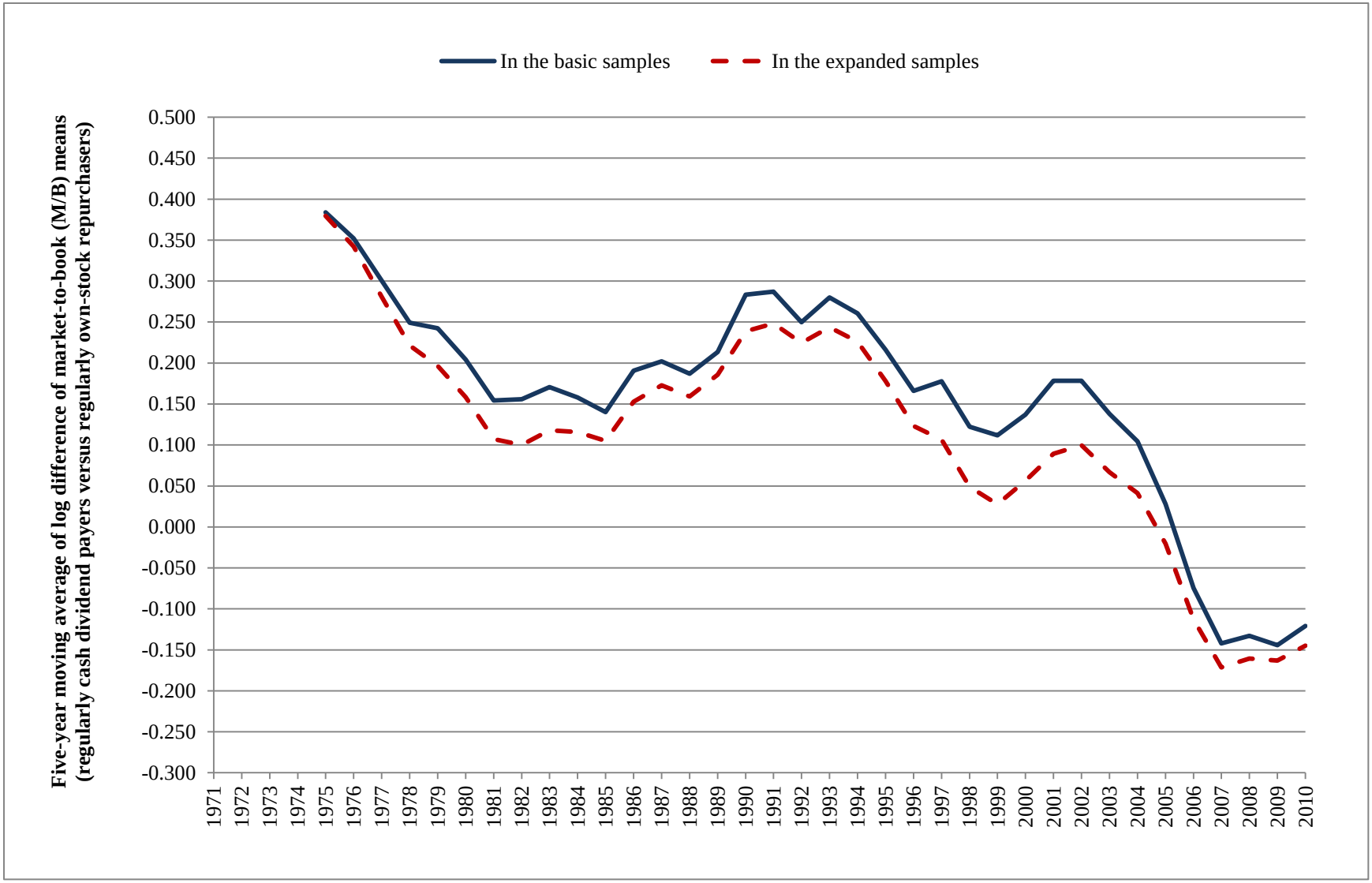


Table 3
The payout-form premium (discount) estimated by using the matching method to control for potentially confounding factors, 1971 to 2010

This table provides proxies for investors' preference for firms that pay cash dividends regularly over firms that repurchase their stock regularly. To estimate the payout-form premium (or discount) in calendar year *t* (FORM-PREM$_t$), firm-year observations in the samples of regularly cash-dividend payers and regularly stock repurchasers are classified into groups defined by cut-off points in the NYSE distributions for the following firm attributes: (1) profitability (E/A), measured similar to Baker and Wurgler (2004b) and Fama and French (2001) (i.e., earnings before extraordinary items *plus* interest expense *plus* income statement deferred taxes *divided* by book assets); (2) cash flow volatility (SRVOL), measured similar to Chay and Suh (2009) (i.e., the standard deviation of monthly stock returns over the most recent two fiscal years); (3) firm size (NYP), measured similar to Baker and Wurgler (2004b) and Fama and French (2001) (i.e., the percent of NYSE firms with the same or lower market capitalization (the natural log of price times shares outstanding at the end of June of year *t*, from CRSP)); (4) financial life-cycle stage (RE/TE), measured similar to DeAngelo, DeAngelo and Stulz (2006), Denis and Osobov (2008), and Skinner (2008) (i.e. ratio of retained earnings (earned equity) *divided* by the total book value of common stockholders' equity (contributed equity)); and (5) total net (cash and net repurchases) payout yield (TOTYLD), measured as the sum of the cash dividend yield (cash dividends per share by ex date *divided by* calendar-year end stock price) *plus* the stock repurchase yield (1 *minus* the ratio of split-adjusted shares outstanding at *t* to split-adjusted shares outstanding at *t-1*)). The categories for E/A, SRVOL, and TOTYLD are NYSE quintiles. Similar to Fama and French (2008), the NYP categories are: (1) Microcap stocks (below the 20th percentile of NYSE market cap); (2) Small stocks (between the 20th and 50th percentiles); and (3) Big stocks (above the NYSE median). The RE/TE stages are: 1st stage (RE/TE < 0); 2nd stage (0 ≤ RE/TE ≤ 0.6); and 3rd stage (RE/TE > 0.6) which represent splitting the distribution to 33.8%, 34.3% and 31.8%, respectively. Then, the average market-to-book (M/B) ratio for each of the sub-groups of regularly cash-dividend payers and regularly stock repurchasers, and the difference between the natural logarithms of these averages are computed for each group. FORM-PREM$_t$ in calendar year *t* is the mean (or median) of the natural log differences across all groups pertaining to a particular set of matching criteria. A group that does not have at least one firm in each of its sub-groups is excluded. N is the number of included groups. The statistical significance of FORM-PREM$_t$ using the *t*-test is determined using the cross-sectional standard error. The null hypothesis tested is that the mean (median) i.e. FORM-PREM$_t$ is zero. ***, ** and * (+++, ++ and +) indicate rejection of the null hypothesis at the 1, 5 and 10 percent levels, respectively, in a two-tailed *t*-test (*Wilcoxon*-test). If FORM-PREM$_t$ is statistically significantly positive (negative) then investors put a stock price premium (discount) on firms that pay cash dividends regularly compared to firms that repurchase their stock regularly.

Panel A: Basic samples															
Calendar year	Groups defined by E/A , SRVOL and TOTYLD (5 *times* 5 *times* 5 = 125 potential groups)					Groups defined by E/A , NYP and TOTYLD (5 *times* 3 *times* 5 = 75 potential groups)					Groups defined by E/A , RE/TE and TOTYLD (5 *times* 3 *times* 5 = 75 potential groups)				
	FORM-PREM$_t$		Statistical significance		N	FORM-PREM$_t$		Statistical significance		N	FORM-PREM$_t$		Statistical significance		N
	Mean	Median				Mean	Median				Mean	Median			
1971	0.091	0.081	*	+	9	0.067	0.073			8	0.161	0.159	***	+	6
1972	0.068	0.018			9	-0.018	0.007			8	0.091	0.049			6
1973	0.251	0.140	**	++	17	0.180	0.103	*	+	16	0.264	0.131	**	+++	17
1974	0.170	0.135	***	+++	38	0.099	0.078	**	+	29	0.194	0.149	***	+++	30
1975	0.214	0.206	***	+++	43	0.059	0.088	*		28	0.213	0.191	***	+++	35
1976	0.166	0.143	***	+++	28	0.089	0.020			20	0.213	0.180	***	+++	25

1977	0.160	0.134	**	++	25	0.089	0.089	*		18	0.161	0.184	**	++	23
1978	0.130	0.079	***	++	29	0.112	0.100	**	++	24	0.180	0.138	***	+++	25
1979	0.209	0.168	***	+++	32	0.117	0.104	**	++	24	0.163	0.164	***	+++	24
1980	0.090	0.091			31	-0.015	0.037			18	0.069	0.099			24
1981	0.046	0.144		+	30	-0.006	0.030			17	0.191	0.065			24
1982	0.153	0.144	**	+++	26	0.111	0.052		+	16	0.113	0.133		++	21
1983	0.180	0.178	***	+++	33	0.149	0.108	**	++	17	0.172	0.165	***	+++	26
1984	0.113	0.112		++	28	0.084	0.069			19	0.140	0.081	**	++	22
1985	-0.051	-0.013			37	-0.131	-0.072			25	-0.091	-0.014			27
1986	0.246	0.157	***	+++	36	0.082	0.086	**	+	22	0.218	0.204	***	+++	26
1987	0.154	0.136	***	+++	33	0.100	0.090	**	++	20	0.139	0.169	***	+++	22
1988	0.033	0.085			52	0.010	0.017			37	0.071	0.097		+++	37
1989	0.068	0.052		+	41	0.035	0.027			26	0.116	0.165	**	+++	29
1990	0.102	0.140	**	+++	46	0.053	0.040		+	29	0.112	0.154	***	+++	34
1991	0.158	0.173	***	+++	45	0.075	0.103	**	++	25	0.178	0.226	***	+++	37
1992	0.173	0.204	**	+++	43	0.033	0.092			23	0.208	0.284	*	+++	30
1993	0.153	0.205	**	++	31	0.117	0.130	*	+	21	0.204	0.291	***	+++	25
1994	0.120	0.144			27	0.040	-0.012			23	0.140	0.123			25
1995	0.060	0.023			41	-0.005	0.009			28	0.098	0.150	*	+	31
1996	0.002	-0.009			37	-0.049	0.000			25	0.021	0.086			27
1997	0.157	0.077	**	++	46	0.049	0.007			30	0.136	0.160	**	++	30
1998	0.076	0.145			51	-0.064	-0.064			33	0.096	0.104			36
1999	0.054	0.101		++	62	-0.123	-0.085	*	+	38	-0.022	0.084			37
2000	0.098	0.181	*	+++	63	-0.018	0.053			39	0.075	0.132		+++	38
2001	0.193	0.208	***	+++	49	0.063	0.131		+	34	0.190	0.220	***	+++	37
2002	0.140	0.127	**	++	44	0.016	0.045			28	0.156	0.129	***	+++	28
2003	-0.068	-0.116			43	-0.141	-0.131	***	+++	26	-0.055	-0.018			27
2004	-0.001	0.009			38	-0.006	0.011			25	0.051	0.044			23
2005	-0.082	-0.156		+	40	-0.050	-0.067			29	-0.057	-0.102			30
2006	-0.201	-0.180	***	+++	48	-0.187	-0.195	***	+++	35	-0.185	-0.171	***	+++	37
2007	-0.161	-0.152	***	+++	56	-0.210	-0.171	***	+++	39	-0.169	-0.141	***	+++	36
2008	-0.100	-0.110	**	++	73	-0.055	-0.059		+	51	-0.046	-0.080		+	48
2009	-0.030	-0.010			55	-0.040	-0.044			40	-0.044	0.025			37
2010	-0.009	0.002			44	-0.035	-0.087			30	-0.003	0.059			31

Panel B: Expanded samples															
Calendar year	Groups defined by E/A , SRVOL and TOTYLD (5 *times* 5 *times* 5 = 125 potential groups)					Groups defined by E/A , NYP and TOTYLD (5 *times* 3 *times* 5 = 75 potential groups)					Groups defined by E/A , RE/TE and TOTYLD (5 *times* 3 *times* 5 = 75 potential groups)				
	FORM-PREM$_t$		Statistical significance		N	FORM-PREM$_t$		Statistical significance		N	FORM-PREM$_t$		Statistical significance		N
	Mean	Median				Mean	Median				Mean	Median			
1971	0.091	0.081	*	+	9	0.069	0.073			8	0.161	0.159	**	+	6
1972	0.068	0.018			9	-0.018	0.007			8	0.091	0.049			6
1973	0.232	0.139	**	++	18	0.168	0.081	*	+	17	0.266	0.137	**	+++	17
1974	0.167	0.116	***	+++	38	0.095	0.066	**	+	30	0.193	0.152	***	+++	30
1975	0.200	0.206	***	+++	45	0.045	0.078			31	0.206	0.178	***	+++	35
1976	0.115	0.104	**	+	32	0.080	0.015			23	0.194	0.167	***	+++	25
1977	0.084	0.041			33	0.023	-0.001			25	0.095	0.061	*		29
1978	0.113	0.036	**	++	34	0.065	0.025			28	0.147	0.082	***	+++	27
1979	0.144	0.082	**	++	35	0.052	0.061			28	0.100	0.111	*	++	26
1980	0.094	0.086			35	-0.023	0.037			23	0.028	0.085			24
1981	0.025	0.088			34	-0.049	0.002			19	0.153	0.053			25
1982	0.077	0.059			34	0.030	0.008			22	0.051	0.094			23
1983	0.144	0.127	***	+++	38	0.090	0.074		+	21	0.149	0.139	**	++	27
1984	0.079	0.078		+	35	0.084	0.020			23	0.125	0.023	**		24
1985	-0.055	-0.013			43	-0.109	-0.072	*	+	27	-0.074	-0.014			27
1986	0.169	0.127	***	+++	46	0.063	0.059	*	+	26	0.216	0.200	***	+++	28
1987	0.087	0.055	**	+	39	0.042	0.035			23	0.117	0.102	**	++	23
1988	0.042	0.082		+	57	0.000	0.027			40	0.069	0.094		+++	38
1989	0.021	0.033			47	0.019	0.032			31	0.088	0.154	*	++	29
1990	0.046	0.066			52	0.006	0.012			34	0.064	0.086	*	+	36
1991	0.162	0.181	***	+++	48	0.060	0.103	*	++	29	0.172	0.226	***	+++	37
1992	0.146	0.175	**	+++	45	0.032	0.048			26	0.213	0.304	*	+++	31
1993	0.133	0.180	**	++	34	0.076	0.068			26	0.177	0.180	**	++	26
1994	0.085	0.112			32	0.019	-0.020			26	0.109	0.057			28
1995	0.038	0.023			45	-0.033	-0.047			32	0.084	0.103		+	31

1996	0.007	0.029			41	-0.048	-0.013			28	-0.012	0.038			28
1997	0.110	0.025	**		50	0.003	-0.016			32	0.103	0.078			30
1998	-0.011	0.094			56	-0.133	-0.114	*	++	35	0.034	-0.032			37
1999	-0.023	0.018			63	-0.163	-0.119	***	+++	39	-0.068	-0.033			37
2000	0.053	0.093		+++	65	-0.060	-0.029			42	0.020	0.082		++	38
2001	0.135	0.165	**	+++	52	0.052	0.122		+	35	0.180	0.190	**	+++	37
2002	0.092	0.093		+	47	0.011	0.012			28	0.115	0.121	**	+	29
2003	-0.109	-0.125	*		43	-0.144	-0.181	***	+++	26	-0.060	0.002			27
2004	-0.030	-0.034			39	-0.035	-0.011			25	0.032	0.041			23
2005	-0.073	-0.127		+	44	-0.038	-0.056			30	-0.054	-0.036			30
2006	-0.204	-0.190	***	+++	51	-0.170	-0.189	***	+++	36	-0.182	-0.166	***	+++	37
2007	-0.170	-0.181	***	+++	61	-0.182	-0.167	***	+++	40	-0.182	-0.162	***	+++	38
2008	-0.097	-0.095	**	++	75	-0.059	-0.112		++	51	-0.044	-0.080		+	48
2009	-0.035	-0.009			55	-0.039	-0.052			40	-0.044	0.028			37
2010	-0.017	0.003			45	-0.038	-0.087			30	-0.008	0.039			32

Figure 3a
The payout-form premium (discount) in the basic samples, 1971 to 2010

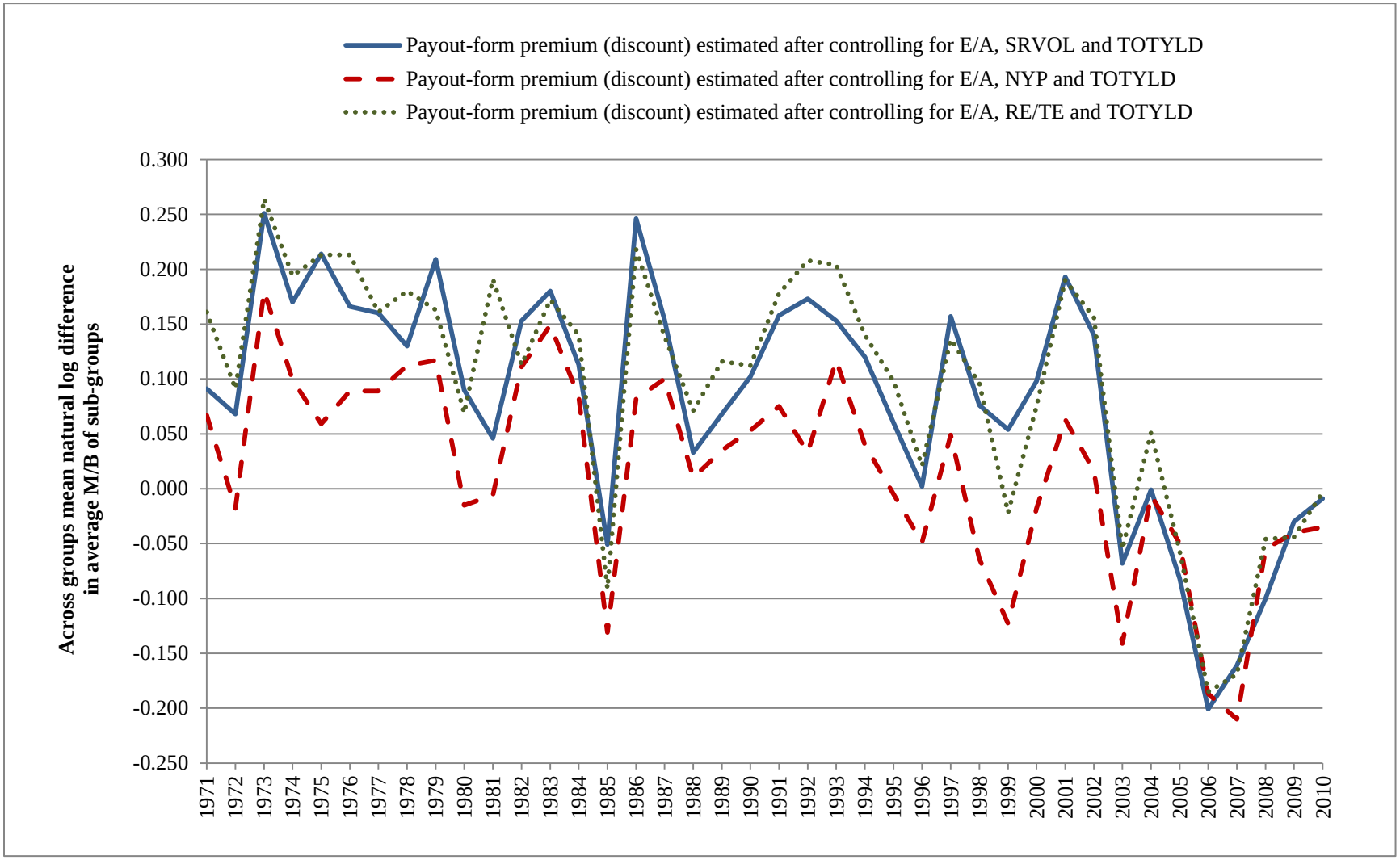


Figure 3b
The payout-form premium (discount) in the expanded samples, 1971 to 2010

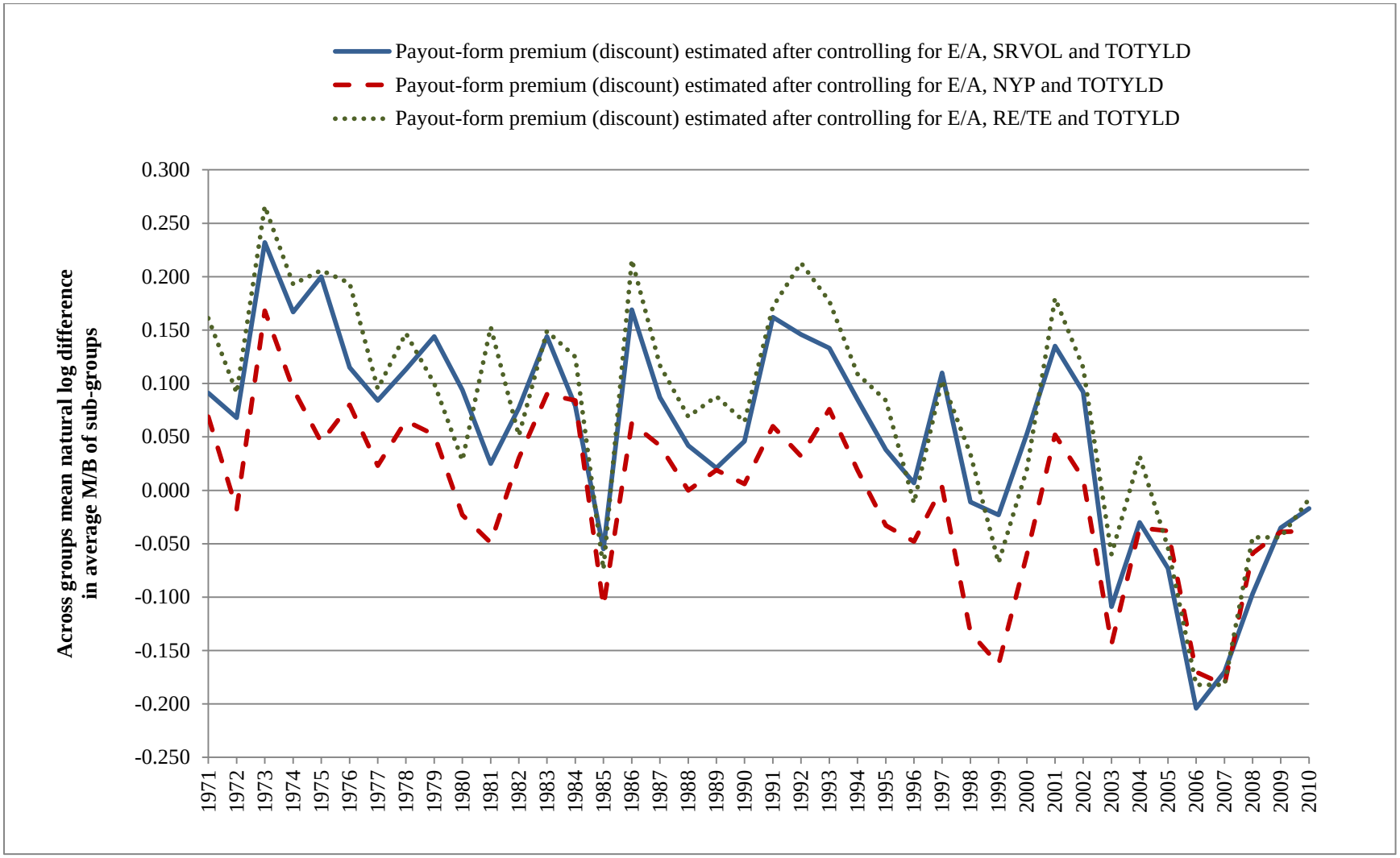


Figure 4a
The five-year moving average of the payout-form premium (discount) in the basic samples, 1971 to 2010

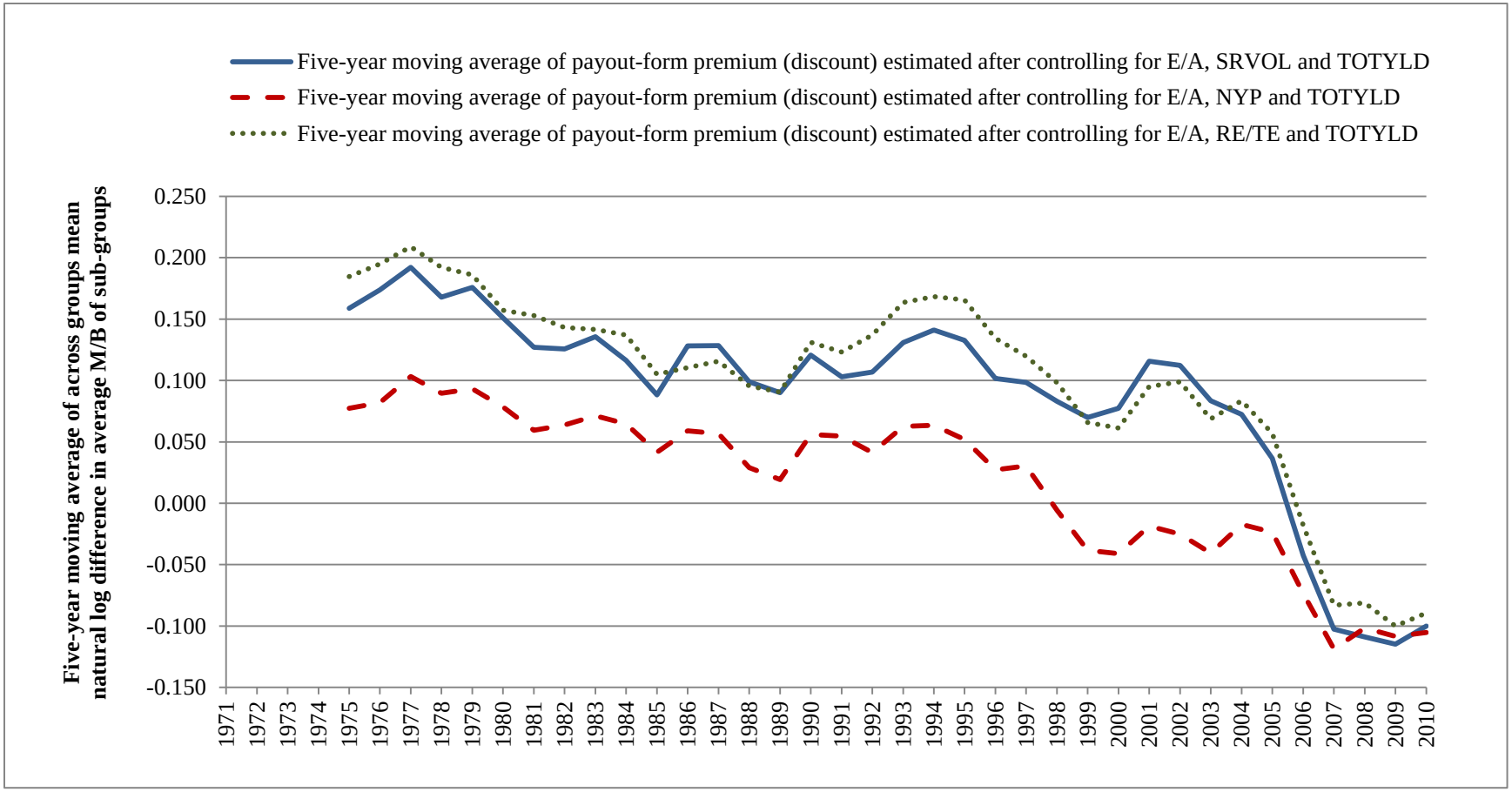


Figure 4b
The five-year moving average of the payout-form premium (discount) in the expanded samples, 1971 to 2010

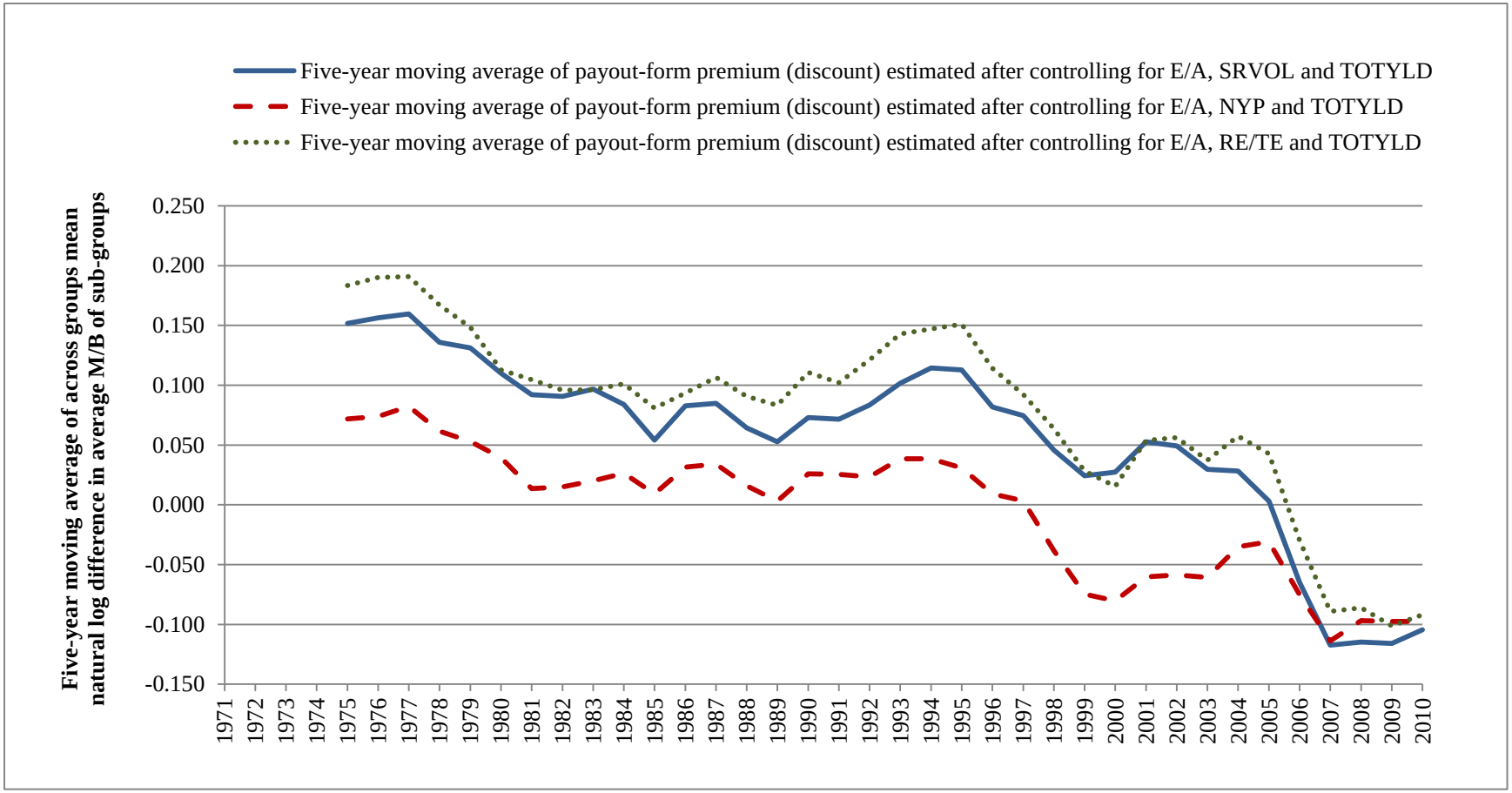


Table 4
The robustness of the payout-form premium (discount) using a modified version of the firm-value model of Fama and French (1998), 1971 to 2010

This table employs the following *firm* and *time fixed-effects* regression model that is a modified version of the firm-value model of Fama and French (1998) to examine the robustness of the payout-form premium:

$$Ln\,(M_{j,t} / B_{j,t}) = \alpha_0 + \alpha_1 [E_{j,t} / B_{j,t}] + \alpha_2 [(B_{j,t} - B_{j,t-2}) / B_{j,t}] + \alpha_3 [RD_{j,t} / B_{j,t}] + \alpha_4 [I_{j,t} / B_{j,t}] + \alpha_5 [TNP_{j,t} / B_{j,t}] + \alpha_6 [FORMDUM_{j,t} * FORM\text{-}PREM_t]$$
$$+ \beta_2 FDUM_2 + \ldots + \beta_n FDUM_n + \delta_1 YDUM_{1972} + \ldots + \delta_{39} YDUM_{2010} + \varepsilon_{j,t}$$

Ln $(M_{j,t} / B_{j,t})$ is the natural logarithm of market-to-book ratio of assets of firm *j* in year *t*, measured similar to Baker and Wurgler (2004a) and Fama and French (2001). $B_{j,t}$ is the book value of assets. $E_{j,t}$ is earnings before extraordinary items *plus* interest expense *plus* income statement deferred taxes and investment tax credit. $RD_{j,t}$ is research and development expenditures. $I_{j,t}$ is interest expense. All these explanatory variables are measured similar to Fama and French (1998). $TNP_{j,t}$ is total net payout measured as the sum of total cash dividends paid and net stock repurchases (i.e., (the split-adjusted shares outstanding at *t*-1 *minus* the split-adjusted shares outstanding at *t*) *times* average of the fiscal year monthly closing prices). $TNP_{j,t}$ replaces $D_{j,t}$ (i.e., total dividends paid during fiscal year *t*) in the model of Fama and French (1998). $FORMDUM_{j,t}$ is a binary variable that takes the value of 0 when firm *j* is a regularly stock repurchaser, and the value of +1 when it is a regularly cash dividend payer. $FORM\text{-}PREM_t$ is the payout-form premium (discount) in year *t* (means and medians series). FDUM is a binary variable that takes the value of 1 for firm *j* and 0 otherwise. YDUM is a binary variable that takes the value of 1 for year *t* and 0 otherwise. $\varepsilon_{j,t}$ is the error term. The null hypothesis of the Hausman-test (i.e., that the random-effects model is preferred over the fixed-effects model) is rejected at the 1% level in all models below. The null hypothesis of the Wald-test that the coefficients δ_1 through δ_{39} are all equal to zero is rejected at the 1% level in all models below. For these reasons, a *firm* and *time fixed-effects* regression model (with standard errors robust to heteroskedasticiy) is employed. The coefficient of interest, namely α_6 , is reported below along with the coefficient of determination (R^2) of the model and the number of observations (N). *** indicates rejection of the null hypothesis, that α_6 is equal to zero, at the 1 percent level in a two-tailed *t*-test. The complete output is readily available from the authors. All the variables in the model are found statistically significant at conventional levels.

Payout-form premium (discount) measure		$FORM\text{-}PREM_t$ (no controls for possibly confounding factors)		$FORM\text{-}PREM_t$ estimated by controlling for E/A, SRVOL and TOTYLD		$FORM\text{-}PREM_t$ estimated by controlling for E/A, NYP and TOTYLD		$FORM\text{-}PREM_t$ estimated by controlling for E/A, RE/TE and TOTYLD	
Series		Means	Medians	Means	Medians	Means	Medians	Means	Medians
Basic samples N = 35,314	α_6	0.478***	0.530***	0.732***	0.710***	0.621***	0.679***	0.668***	0.727***
	R^2 (%)	40.47	40.49	40.47	40.49	40.37	40.43	40.44	40.44
Expanded samples N = 36,453	α_6	0.233***	0.224***	0.410***	0.418***	0.308***	0.317***	0.356***	0.375***
	R^2 (%)	40.84	40.84	40.84	40.87	40.77	40.81	40.82	40.82

Table 5
Investors' response at declaration of unexpected extraordinary / special cash dividends, 1971 to 2010

This table provides the yearly means for the estimated (1) bang-for-the-buck $AR_{j,t}$ / $DIV_{j,t}$ (i.e. the two-day declaration-period abnormal stock return divided by the dollar amount of the extraordinary / special dividend), and (2) standardized bang-for-the-buck $SAR_{j,t}$ / $DIV_{j,t}$ (i.e. the two-day declaration-period standardized abnormal stock return divided by the dollar amount of the extraordinary / special dividend), over the period 1971 to 2010. Standardizing the abnormal stock returns, similar to Baker and Wurgler (2004a), controls for differences in volatility across firms and time. Extraordinary / special U.S. cash dividends are obtained from CRSP using distribution codes 1272, 1273, 1274 and 1278. For consistency with the screening criteria used above to identify firms and then estimate the payout-form premium, excluded are declarations by: (1) firms with book equity below $250,000 or assets below $500,000; (2) firms that do not have CRSP share codes of 10 or 11; and (3) utilities and financial firms. In addition, for the declaration to be unexpected, excluded are all such declarations that are preceded during a period of three years by another similar declaration by the same firm. The sample consists of 1482 cases. The declaration-period abnormal return for a firm is obtained from the market model using daily return data, the equally-weighted CRSP index, and the OLS procedure. The parameters' estimation period is day-150 through day -31 relative to the declaration-date. The standardized abnormal return for each firm is its two-day declaration-period abnormal return scaled by the square root of two times the standard deviation of its daily excess returns, which is estimated from day -150 through day -31 before the declaration date. The statistical significance of investors' mean response in a calendar year *t* using the *t*-test is determined using the cross-sectional standard error. The null hypothesis is that the mean (median) is zero. ***, ** and * (+++, ++ and +) indicate rejection of the null hypothesis at the 1, 5 and 10 percent levels, respectively, in a two-tailed *t*-test (*Wilcoxon*-test).

Calendar year	N	Investors' response measured as mean of $AR_{j,t}$ / $DIV_{j,t}$	Investors' response measured as mean of $SAR_{j,t}$ / $DIV_{j,t}$	Calendar year	N	Investors' response measured as mean of $AR_{j,t}$ / $DIV_{j,t}$	Investors' response measured as mean of $SAR_{j,t}$ / $DIV_{j,t}$
1971	13	0.194	0.927	1991	17	0.242	0.506
1972	62	0.449***+++	2.415***+++	1992	20	-0.124	-0.564
1973	138	0.407***+++	2.017***+++	1993	18	0.238	0.373
1974	102	0.380**+++	1.850**+++	1994	15	0.811*+++	2.800*+++
1975	88	0.361+++	1.630*+++	1995	20	0.339	0.913
1976	103	0.613***+++	2.823***+++	1996	18	0.168	0.631
1977	56	0.181**++	0.931**++	1997	13	0.448	1.948+
1978	54	0.350**++	1.440***++	1998	7	0.086	0.366
1979	49	0.467***+++	1.758***+++	1999	12	0.173*	0.580*
1980	36	0.163++	0.774++	2000	15	0.083+	0.206+
1981	28	0.140	0.597	2001	7	0.293	1.254*
1982	12	0.403*++	1.834*++	2002	11	0.342*++	1.312*++
1983	23	-0.271	-1.129	2003	35	0.163+++	0.661+++
1984	41	0.208	0.724	2004	53	-0.540+++	-3.502+++
1985	17	0.093	0.357	2005	35	0.002	0.061
1986	20	0.015	-0.011	2006	32	0.133++	0.492++
1987	33	0.279**++	1.152**++	2007	41	0.007++	0.023++
1988	47	0.217+++	0.748+++	2008	36	-0.037++	-0.247++
1989	58	0.033++	0.134++	2009	18	-0.054	-0.171
1990	33	-0.010+	-0.112+	2010	46	0.172***+++	0.809***+++

Table 6
Correlation between the payout-form premium (discount) and investors' response to extraordinary / special cash dividend declaration, 1971 to 2010

This table reports Pearson's correlation coefficient, Spearman's rank correlation coefficient, and unit root tests. Spearman's correlation coefficient is less sensitive than Pearson's to strong outliers that may exist in the tails of both samples. The null hypothesis tested for the correlation coefficients is that there is no correlation. The last column shows the results of the augmented Dickey-Fuller test of a unit root. The null hypothesis tested is that there is a unit root (i.e. the series is non-stationary). The test statistic is reported in parentheses. ***, ** and * indicate rejection of the null hypothesis at the 1, 5 and 10 percent levels, respectively.

		Pearson's correlation (atop) and Spearman's rank correlation (beneath) with		Augmented Dickey-Fuller test of a unit root
		Investors' response measured as mean of $AR_{j,t}$ / $DIV_{j,t}$	Investors' response measured as mean of $SAR_{j,t}$ / $DIV_{j,t}$	
Basic samples (annual means series)	FORM-PREM$_t$ (no controls for possibly contaminating factors)	0.401** 0.458***	0.407*** 0.382**	-0.191 (-2.39)**
	FORM-PREM$_t$ estimated by controlling for E/A, SRVOL and TOTYLD	0.377** 0.469***	0.363** 0.418***	-0.253 (-2.37)**
	FORM-PREM$_t$ estimated by controlling for E/A, NYP and TOTYLD	0.294* 0.477***	0.274* 0.410***	-0.532 (-3.74)***
	FORM-PREM$_t$ estimated by controlling for E/A, RE/TE and TOTYLD	0.344** 0.432***	0.320** 0.375**	-0.259 (-2.46)**
Expanded samples (annual means series)	FORM-PREM$_t$ (no controls for possibly contaminating factors)	0.366** 0.415***	0.389** 0.355**	-0.188 (-2.50)**
	FORM-PREM$_t$ estimated by controlling for E/A, SRVOL and TOTYLD	0.387** 0.493***	0.375** 0.431***	-0.289 (-2.57)**
	FORM-PREM$_t$ estimated by controlling for E/A, NYP and TOTYLD	0.302** 0.448***	0.293* 0.389**	-0.545 (-3.81)***
	FORM-PREM$_t$ estimated by controlling for E/A, RE/TE and TOTYLD	0.322** 0.425***	0.305* 0.372**	-0.324 (-2.81)***
Augmented Dickey-Fuller test of a unit root		-0.475 (-3.45)***	-0.535 (-3.73)***	

Table 7
Changes in payout-form premium (discount) over time and the differential tax-burden on dividends and capital gains, 1971 to 2010

This table applies the following multivariate regression model: $\text{FORM-PREM}_t = \phi_0 + \phi_1 \text{DIFF-TAX}_{t-1} + \phi_2 \text{MARKET}_t + \phi_3 \text{TREND}_t + \varepsilon_{j,t}$ FORM-PREM_t is the measure of investors' preference for cash dividends versus stock repurchases in year *t* (means and medians series). DIFF-TAX_{t-1} is the one-year-lagged measure of differential tax-burden on dividends and long-term capital gains. For robustness, four alternative measures of the latter are used. DIFF-TAX1 is the aggregate tax preference parameter used by Poterba (2004). It takes into account the time-series changes in the shares of U.S. equities held by households, corporations, and pensions. It assumes the marginal investor faces a tax rate on dividends and capital gains equal to the tax rate of the average investor (i.e. average of marginal rates), and it assumes a 25 percent annual capital gain realization. DIFF-TAX2 is similar to DIFF-TAX1 but it excludes pensions (i.e. it is the aggregate tax preference parameter for taxpayers only). DIFF-TAX3 is the tax preference parameter for households only. It includes U.S. Federal & State taxes , it assumes the marginal investor faces a tax rate on dividends and capital gains equal to the tax rate of the average investor, and it assumes a 25 percent annual capital gain realization. DIFF-TAX4 is similar to DIFF-TAX3 but it assumes investors completely avoid realizing any capital gains. Data on shareholdings of U.S. equities are obtained from Tables L.213 and L.214 of the *Flow of Funds Accounts of the United States*. Tax data are obtained from Tables 3.2 and 3.3 of the *National Income and Product Accounts* and the website of the National Bureau of Economic Research and the TAXSIM model (www.nber.org/taxsim and Feenberg and Coutts (1993)). One-year lagged series of differential tax burden are used since investors might not have access to all the needed information on current tax rates and income distributions at the beginning of the year *t*. The results (available from the authors) are generally similar using concurrent tax observations. MARKET_t is the excess stock market return (market return minus one-year U.S. treasury rate) over year *t* and may capture investor sentiment. Data are obtained from the website of Professor Kenneth French. TREND_t is a linear time trend (1 to 40) which may capture the effects of many factors, including declining market impact and transaction costs of home-making dividends, improved corporate disclosures, etc. The null hypothesis tested below is that the coefficient is zero, ***, ** and * indicate rejection of the null hypothesis at the 1, 5 and 10 percent levels, respectively, in a two-tailed *t*-test, using standard errors that are robust to heteroskedasticity and serial correlation up to four lags (Newey and West (1987)). *N* is the number of observations.

Panel A: Basic samples								
Dependent variable	Series of dependent variable	Measure of relative tax burden on dividends and long-term capital gains	ϕ_0	ϕ_1	ϕ_2	ϕ_3	R^2 (%)	N
FORM-PREM_t (no controls for possibly confounding factors)	Means	DIFF-TAX1_{t-1}	-1.006***	1.962***	-0.152	-0.019***	61.8	40
		DIFF-TAX2_{t-1}	-0.808***	1.893***	-0.137	-0.019***	64.4	40
		DIFF-TAX3_{t-1}	-0.649***	1.726***	-0.132	-0.018***	66.2	40
		DIFF-TAX4_{t-1}	-0.649***	1.880***	-0.124	-0.019***	64.9	40
	Medians	DIFF-TAX1_{t-1}	-1.063***	1.842***	-0.095	-0.013***	39.7	40
		DIFF-TAX2_{t-1}	-0.558*	1.272**	-0.069	-0.011**	34.0	40
		DIFF-TAX3_{t-1}	-0.481**	1.209***	-0.067	-0.010**	36.6	40
		DIFF-TAX4_{t-1}	-0.435*	1.234**	-0.060	-0.011**	33.9	40

FORM-PREM$_t$ estimated by controlling for E/A, SRVOL and TOTYLD	Means	DIFF-TAX1$_{t-1}$	-0.203	0.572*	-0.065	-0.008***	42.1	40
		DIFF-TAX2$_{t-1}$	-0.013	0.344	-0.055	-0.007***	40.9	40
		DIFF-TAX3$_{t-1}$	0.008	0.326	-0.055	-0.007***	41.2	40
		DIFF-TAX4$_{t-1}$	0.061	0.259	-0.052	-0.007***	40.4	40
	Medians	DIFF-TAX1$_{t-1}$	-0.293	0.666	-0.076	-0.008**	31.5	40
		DIFF-TAX2$_{t-1}$	-0.041	0.350	-0.064	-0.006*	29.5	40
		DIFF-TAX3$_{t-1}$	-0.039	0.364	-0.064	-0.006*	30.1	40
		DIFF-TAX4$_{t-1}$	0.007	0.314	-0.061	-0.006*	29.3	40
FORM-PREM$_t$ estimated by controlling for E/A, NYP and TOTYLD	Means	DIFF-TAX1$_{t-1}$	-0.309	0.606**	-0.114**	-0.007***	47.3	40
		DIFF-TAX2$_{t-1}$	-0.160	0.445*	-0.106*	-0.007***	46.4	40
		DIFF-TAX3$_{t-1}$	-0.105	0.377*	-0.105*	-0.006***	46.3	40
		DIFF-TAX4$_{t-1}$	-0.081	0.367	-0.102*	-0.006***	45.6	40
	Medians	DIFF-TAX1$_{t-1}$	-0.318	0.606**	-0.105	-0.007***	46.1	40
		DIFF-TAX2$_{t-1}$	-0.146	0.408	-0.096	-0.006***	44.4	40
		DIFF-TAX3$_{t-1}$	-0.104	0.359	-0.095	-0.006***	44.6	40
		DIFF-TAX4$_{t-1}$	-0.082	0.352	-0.093	-0.006***	43.8	40
FORM-PREM$_t$ estimated by controlling for E/A, RE/TE and TOTYLD	Means	DIFF-TAX1$_{t-1}$	-0.306	0.751*	-0.122	-0.009***	49.3	40
		DIFF-TAX2$_{t-1}$	-0.147	0.592*	-0.113	-0.009***	48.7	40
		DIFF-TAX3$_{t-1}$	-0.104	0.551*	-0.112	-0.008***	49.3	40
		DIFF-TAX4$_{t-1}$	-0.042	0.488	-0.107	-0.008***	47.8	40
	Medians	DIFF-TAX1$_{t-1}$	-0.619	1.139**	0.001	-0.009***	33.0	40
		DIFF-TAX2$_{t-1}$	-0.368	0.884**	0.015	-0.008***	31.2	40
		DIFF-TAX3$_{t-1}$	-0.307	0.829**	0.016	-0.008***	33.0	40
		DIFF-TAX4$_{t-1}$	-0.237	0.775*	0.022	-0.008**	29.7	40

Panel B: Expanded samples								
Dependent variable	Series of dependent variable	Measure of relative tax burden on dividends and long-term capital gains	ϕ_0	ϕ_1	ϕ_2	ϕ_3	R^2 (%)	N
FORM-PREM$_t$ (no controls for possibly confounding factors)	Means	DIFF-TAX1$_{t-1}$	-1.108***	2.066***	-0.151	-0.020***	68.8	40
		DIFF-TAX2$_{t-1}$	-0.948***	2.071***	-0.138	-0.021***	72.9	40
		DIFF-TAX3$_{t-1}$	-0.752***	1.850***	-0.132	-0.019***	74.4	40
		DIFF-TAX4$_{t-1}$	-0.794***	2.092***	-0.124	-0.021***	74.0	40
	Medians	DIFF-TAX1$_{t-1}$	-0.976**	1.716***	-0.076	-0.014***	51.8	40
		DIFF-TAX2$_{t-1}$	-0.522	1.210*	-0.052	-0.012***	47.5	40
		DIFF-TAX3$_{t-1}$	-0.442	1.139**	-0.050	-0.012***	49.5	40
		DIFF-TAX4$_{t-1}$	-0.422	1.204**	-0.044	-0.012***	47.9	40
FORM-PREM$_t$ estimated by controlling for E/A, SRVOL and TOTYLD	Means	DIFF-TAX1$_{t-1}$	-0.258	0.603*	-0.061	-0.008***	49.0	40
		DIFF-TAX2$_{t-1}$	-0.129	0.475	-0.054	-0.008***	48.5	40
		DIFF-TAX3$_{t-1}$	-0.090	0.435*	-0.053	-0.007***	49.0	40
		DIFF-TAX4$_{t-1}$	-0.047	0.395	-0.049	-0.007***	47.8	40
	Medians	DIFF-TAX1$_{t-1}$	-0.459	0.843*	-0.045	-0.008***	35.4	40
		DIFF-TAX2$_{t-1}$	-0.249	0.616*	-0.034	-0.007***	33.6	40
		DIFF-TAX3$_{t-1}$	-0.208	0.579*	-0.033	-0.007***	34.6	40
		DIFF-TAX4$_{t-1}$	-0.176	0.573	-0.029	-0.007***	33.2	40
FORM-PREM$_t$ estimated by controlling for E/A, NYP and TOTYLD	Means	DIFF-TAX1$_{t-1}$	-0.417**	0.713***	-0.115*	-0.007***	50.6	40
		DIFF-TAX2$_{t-1}$	-0.301**	0.618***	-0.108*	-0.007***	50.8	40
		DIFF-TAX3$_{t-1}$	-0.212**	0.502***	-0.105*	-0.006***	50.2	40
		DIFF-TAX4$_{t-1}$	-0.213**	0.547***	-0.102*	-0.007***	49.6	40
	Medians	DIFF-TAX1$_{t-1}$	-0.444***	0.740***	-0.072	-0.007***	48.9	40
		DIFF-TAX2$_{t-1}$	-0.292**	0.592***	-0.063	-0.007***	47.9	40

		DIFF-TAX3$_{t-1}$	-0.220**	0.502***	-0.061	-0.006***	47.9	40
		DIFF-TAX4$_{t-1}$	-0.224*	0.554**	-0.058	-0.006***	47.4	40
FORM-PREM$_t$ estimated by controlling for E/A, RE/TE and TOTYLD	Means	DIFF-TAX1$_{t-1}$	-0.481*	0.961**	-0.120	-0.010***	51.3	40
		DIFF-TAX2$_{t-1}$	-0.319*	0.825***	-0.110	-0.010***	51.3	40
		DIFF-TAX3$_{t-1}$	-0.231	0.721***	-0.108	-0.009***	51.7	40
		DIFF-TAX4$_{t-1}$	-0.202	0.733**	-0.103	-0.009***	50.2	40
	Medians	DIFF-TAX1$_{t-1}$	-0.666**	1.161***	-0.005	-0.009***	36.0	40
		DIFF-TAX2$_{t-1}$	-0.470**	0.995***	0.007	-0.009***	36.1	40
		DIFF-TAX3$_{t-1}$	-0.363**	0.867***	0.010	-0.008***	36.6	40
		DIFF-TAX4$_{t-1}$	-0.340*	0.903**	0.015	-0.008***	34.5	40