

Dividend Taxes and Corporate Behavior: Evidence from the 2003 Dividend Tax Cut*

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Abstract

This paper uses the large tax cut on individual dividend income enacted in 2003 to analyze the effects of dividend taxation on corporate behavior. Using data spanning 1980 to 2004-Q2, we document a sharp and widespread surge in dividend payments following the tax cut, along several dimensions. First, an unprecedented number of firms initiated regular dividend payments after the reform. As a result, the number of publicly traded firms paying dividends, after having declined continuously for more than two decades, began to increase precisely in 2003. Second, many firms that were already paying dividends prior to the reform raised regular dividend payments significantly. Third, special dividends also rose. All of these effects are robust to introducing controls for profits and other firm characteristics. Additional evidence for specific groups of firms suggests that the tax cut induced increases in total payout rather than substitution between dividends and repurchases. The tax response was confined to firms with lower levels of forecasted growth, consistent with an improvement in capital allocation efficiency. The response to the tax cut is strongest in firms with strong principals (presence of independent directors with large share holdings or large institutional ownership) and in firms where agents had stronger incentives to respond (large executive ownership and low levels of executive stock-options outstanding). These findings show that principal-agent issues play a central role in corporations' responses to taxation.

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1 Introduction

The taxation of dividend income has generated much interest both in the public economics literature and among tax policy makers. The taxation of dividend income creates a particularly stark version of the equity-efficiency tradeoff. Dividend income, and especially taxable dividend income, accrues very disproportionately to wealthy individuals.¹ Therefore, taxing dividend income seems desirable for redistributive reasons. However, taxing dividend income may also generate large efficiency costs. Dividend taxes reduce the net return to investors, potentially reducing savings and the capital stock in the economy. In addition, taxing dividend income at the individual level could induce firms to retain earnings rather than distribute dividends to reduce their tax burdens. If agency problems lead to inefficient investment of retained earnings (e.g. as in Jensen 1986, Scharfstein and Stein 2000), dividend taxation could reduce the efficiency of capital allocation in addition to distorting the amount of investment.² Despite extensive research, the effects of dividend taxation on dividend payments and corporate behavior remain controversial in the public economics and corporate finance literature, largely because of the lack of a sharp tax experiment, and therefore of a fully convincing research design (see Auerbach (2003) and Allen and Michaely (2003) for recent surveys).

The Jobs and Growth Tax Relief Reconciliation Act of 2003 in the United States (hereafter, the “2003 tax reform”) provides a unique opportunity to understand the effects of dividend taxation on corporate behavior. One of the key provisions of the reform was to introduce favorable treatment for dividend income earned by individuals. After the reform, dividends are taxed at a rate of 15% instead of facing the regular progressive income tax schedule with a top rate of 35%.³ This tax change effectively gave to dividend income the same favorable tax treatment as realized capital gains income.⁴ The tax reform was officially signed into law at

¹Individual Income Tax Statistics for year 2000 (U.S. Treasury Department, 2003) show that about two thirds of taxable dividends are earned by the top 10% income taxpayers. More than half of American families now hold stock through pension or college funds but returns on those assets are exempted from income taxes and hence not affected by the 2003 tax reform.

²Indeed, Corporate America has traditionally lobbied for corporate tax reductions but not dividend tax reductions, suggesting that managers of large corporations might prefer to retain earnings rather than distribute dividends.

³More precisely, taxpayers in the bottom two income tax brackets (facing a regular marginal tax rate of 10% or 15%) face a new dividend tax rate of only 5%, while taxpayers in the top four brackets (facing marginal tax rates of 25, 28, 33, or 35%) face a new dividend tax rate is 15%. Taxpayers on the Alternative Minimum Tax schedule (flat rate of 28%) benefit as well from the reduced 15% tax rate on their dividend income.

⁴Individual dividend income earned through tax favored instruments such as IRAs, 401(k)s and other pension and college funds was not affected by the tax change. Dividend income earned by nonprofit organizations and

the end of May 2003, but was first proposed by the Bush administration on January 7, 2003.⁵ The tax cut on dividend income was made retroactive to the beginning of 2003. Therefore, during the first two quarters of 2003, corporations knew that dividends would face lower taxes with substantial probability. Starting in June 2003, this became certain. The tax cut is scheduled to expire by 2009, but the actual duration is contingent of political developments.⁶

This paper uses the 2003 dividend tax cut to estimate the effect of dividend taxes on dividend payments by publicly traded corporations. The leading example for both the incentive and distributional consequences of the tax cut is Microsoft, the company with the largest accumulated cash holdings in the U.S. Microsoft initiated regular dividend payments for the first time in 2003. In July 2004, Microsoft announced an additional special one-time dividend payment of \$32 billion to be paid in December 2004, an amount that far exceeds any dividend payment previously made by a single U.S. corporation. The tax-savings associated with these payments will clearly benefit wealthy taxpayers disproportionately, starting with Bill Gates the richest person in the United States. The goal of this paper is to examine whether Microsoft's behavior was an anomaly unrelated to the tax cut or whether it is representative of a broader shift in payout policies associated with the tax cut. To answer this question, we use Center for Research in Security Prices (CRSP) data on dividend payments by publicly traded corporations, currently available up to the second quarter of 2004.

We find that the level of total regular dividends has surged by approximately 20% since the beginning of 2003, the point at which the lower tax rate was first proposed and ultimately retroactively applied. However, we face two important econometric challenges in identifying a causal link between this change and the tax reform. First, dividend payments are extremely concentrated: The top 20 payers account for more than half of total dividends paid out by publicly traded firms. Consequently, total (or mean) dividends are driven by a few big payers, making it difficult to make statistically robust inferences about the effects of the tax change without analyzing other moments of the distribution that are more robust to outliers. Second, corporations was not affected either.

⁵Auerbach and Hassett (2004) discuss the timing of the tax reform legislative process in detail. They find that the reduction of dividend taxation was not seriously discussed before the end of December 2003. In particular, it was not mentioned in the Bush 2000 campaign platform. This suggests that there was no anticipation that such a tax change would take place before the very end of 2002.

⁶If President Bush wins again in 2004, the tax cut might well be made permanent, but if Senator Kerry wins and Democrats gain control of Congress as well, this tax cut might be repealed as early as 2005. If Kerry wins but the majority in congress remains Republican, gridlock and no further change is the most plausible outcome.

the size and composition of our sample of firms listed on the NYSE, AMEX, or NASDAQ exchanges fluctuates heavily in the years preceding the tax reform. As a result, deliberate changes in behavior are confounded with changes in sample composition due to entry and exit.⁷ In view of these problems, we control for composition effects by analyzing the properties of entrants and leavers, and divide our analysis of the response to the tax reform into three margins that are more robust to outliers than means: (1) the extensive margin (initiations and terminations of regular dividend payments); (2) the intensive margin (frequency of increases or decreases in payment amounts by firms already paying); and (3) special payments (one time distributions). Our main findings are as follows.

First, we find an unprecedented large surge in dividend initiations exactly in the quarters following enactment of the reform. This constitutes strong evidence that this change in behavior was tax driven. As a result and as the frequency of dividend terminations fell slightly after the tax cut, the fraction of traded companies paying dividends, which had declined continuously over the last two decades (see Fama and French 2001), has increased significantly from a low of 20% in 2002Q4 to almost 25% in 2004Q2. These results are robust to controlling for a variety of potential confounding factors such as levels and lags of profits, assets, cash holdings, industry, and firm age. Second, dividend paying firms were significantly more likely to increase their regular dividend payments after the reform. As with initiations, these increases are widespread, occurring across all sizes of firms, and all industrial sectors, and are robust to the inclusion controls. Third, we find that the number of special (i.e., one time, non-recurring) dividend payments also increased following the 2003 tax reform but the effects on special dividend amounts are driven by a handful of large payers. Adding the extra dividends from the extensive and intensive margins, we estimate that total regular dividends increased by about 20% after the reform, implying an elasticity of regular dividend payments with respect to the dividend tax rate of about -0.5 based on calculations of the average marginal tax rate given in Poterba (2004). It should be noted that this point estimate has a large standard error because of the extreme-values problem described above.

Having established a link between the tax cut and dividend payments, we explore the mechanism and efficiency consequences of the tax response by analyzing the heterogeneity of

⁷Those econometric issues explain, as we discuss in detail below, the sharp differences between our results and the recent studies by Blouin, Raedy, and Shackelford (2004) and Ikenberry and Julio (2004).

the effect across firms. We find that the dividend response was concentrated among firms with good incentives for agents to increase dividend payments or with strong principals with incentives to monitor the firm's payout policies. Firms with large executive share ownership and firms with fewer unexercised stock-options owned by top executives were much more likely to initiate dividend payments. These results reveal that corporate responses to taxation are heavily driven by top managers' self-interests. In addition, firms with large independent shareholders on the board of directors or high institutional ownership were also more likely to raise dividends, especially when top executives have weak incentives to do so. These findings indicate that agency issues play a central role in determining corporation's behavioral responses to taxation, and should be an important element in the analysis of optimal corporate tax policy. In this sense, the results call for a tighter connection between traditional tax efficiency analysis in public economics and the agency theory of the firm in corporate finance.

The second noteworthy result from our heterogeneity analysis is that the dividend initiations and increases were confined to firms with moderate forecasted earnings growth. Firms with high expected growth in earnings did not respond to the tax cut at all, suggesting that the tax cut induced recirculation of capital toward firms with better investment opportunities.

Finally, we explore whether total payout rose after the tax cut, or whether the surge in dividend payments simply substituted for share repurchases. Unfortunately, the volatility of share repurchases in the aggregate makes it difficult to answer this question in the full sample of firms. If we restrict attention to groups of firms where the tax response was strongest – e.g., those with high executive share ownership and high institutional ownership – we are able to show that the fraction of firms using either share repurchases or dividends to pay out earnings rose sharply after the reform. In addition, for those companies who initiated dividends after the reform, total payout (dividends plus share repurchases) increased significantly. Hence, the tax reform does indeed appear to have induced an increase in total payout rather than simply a “relabelling” of repurchases as dividends.

The remainder of the paper is organized as follows. Section 2 provides some background on payout policies and discusses the existing literature on dividends and taxes, including a set of recent studies that have also examined the 2003 tax change. Section 3 describes the data and defines the variables of interest. Section 4 describes our methodology and presents the main results on the change in dividend payments induced by the tax reform. Section 5

examines the heterogeneity of the response, and section 6 investigates whether new dividend payments crowded out share repurchases. Section 7 offers concluding remarks.

2 Background on Payout Policies and Existing Literature

2.1 Payout Policies

Corporations distribute profits to shareholders in two main forms: dividends and share repurchases. In a world without taxes and with perfect information, share repurchases and dividends are equivalent. Under U.S. tax law, because realized capital gains have traditionally been taxed more lightly than dividend income, share repurchases were a more tax efficient way of distributing profits. Share repurchases started becoming more common in the early 1980s following a SEC ruling in 1982 which clarified the rules under which corporations could legally make share repurchases without being subject to dividend taxation (Grullon and Michaely, 2002). However, despite the rise in share repurchases, dividends have remained an important conduit for distributing profits.⁸ The reason why dividends have not been entirely replaced by share repurchases has been termed the “dividend puzzle,” and a number of theories and explanations have been proposed to explain this phenomenon (see Michaely and Allen, 2003). The 2003 tax reform almost eliminated the tax disadvantage of dividends relative to repurchases.

There are two broad categories of dividend payments: regular dividends and special dividends. Regular dividends are periodic and recurrent (in general quarterly but sometimes annual, semi-annual, or more rarely monthly). As noted by Fama and French (2001), the fraction of firms making these regular dividend payments is fairly low in the recent past: less than 25% of the firm-quarter pairs in our sample of publicly traded companies have positive regular dividends. It is common for firms to increase regular dividend payments – 11% of firms initiated or raised dividends in the average quarter. Decreases are much rarer (less than 2% per quarter), consistent with DeAngelo and DeAngelo’s (1990) finding that only severely distressed firms lower dividend payments. Regular dividends are thus extremely persistent over time.⁹ Hence, an initiation of a regular payment (as by Microsoft in 2003) is a strong signal that the firm intends to maintain a dividend payment of equal or greater value permanently.

⁸Over the last decade, total dividend payouts are about the same size as total share repurchases for publicly traded U.S. corporations (see Michaely and Allen, 2003) and Section 6 below. Grullon and Michaely (2002) argue that share repurchases have, to some extent, crowded out dividend payments.

⁹Section 3 gives formal definitions of initiations and terminations.

In contrast to regular dividends, special dividends are one-time, non-recurring events. Special payments are made by very few firms (0.8% of our sample). Special dividends are also generally of minor importance in terms of amounts relative to regular dividends, accounting for less than 2.5% of total dividends on average.

2.2 Previous Work

Most of the early work on the effects of taxation on dividend payments used time series analysis rather than focusing on a single tax reform. The evidence from this literature is controversial, and is typically divided into the “old view” and the “new view.”

The old view, implicit among supporters of the 2003 dividend tax cut, says that dividend taxes reduce the net return on investment and hence reduce the supply of investment. Therefore, when taxes on dividends are cut, individuals are more willing to save and invest their money in stocks, spurring business investment, profits, and dividend distributions in the long run. Poterba and Summers (1985), using time series evidence from the United Kingdom found that, consistent with the “old view”, dividend payments and investment were higher when the tax on dividends was lower. More recently, Poterba (2004) uses U.S. time series data from 1929 to 2002 and finds a negative association between dividend payments and the dividend tax rates relative to taxes on capital gains. Poterba’s estimates imply a very large elasticity of dividend payments with respect to the relative tax rates on dividends and capital gains in the long run. His estimates imply that the 2003 tax reform should eventually increase dividend payments by 20%.¹⁰

In contrast, the new view on dividend taxation, implicit among critics of the 2003 tax reform, assumes that marginal investments are entirely financed by retained earnings rather than new share issues (Auerbach (1979), King (1977), and Bradford (1981)). Under this assumption, the tax on dividends does not affect investment decisions of firms, and profits and dividend payments therefore should not change either.¹¹ In this case, the dividend tax cut is irrelevant for corporate decisions and simply benefits individual investors by reducing

¹⁰Our estimates also point toward a 20% increase in dividend payments but the response we estimate happens much faster than the one predicted by Poterba’s estimates.

¹¹However, as pointed out by Auerbach and Hassett (2003), if the tax reform not only changes dividend income taxation but also interest income taxation (as in the Tax Reform Act of 1986) or if the tax reform is not permanent but temporary (as might be the case with the 2003 tax reform), then even under the new view dividend payments may change following a dividend tax change.

their tax burden. Using U.S. data from 1981 to 1998, Auerbach and Hassett (2003), show that consistent with the new view, dividend payments are sensitive to changes in investment at the firm level, suggesting that retained earnings are indeed the marginal source of investment funds.

A more recent set of papers have attempted to use the variation in tax rates induced by the Tax Reform Act of 1986 (TRA-86) to analyze the effect of dividend taxes on dividend payments, but have also found mixed evidence. TRA-86 cut the top income tax rate from 50% to 28% while increasing the tax rate on capital gains from 20% to 28%. Bolster and Janjigian (1991) find no discernable effect of TRA-86 on aggregate dividend payments by publicly traded firms. However, in an innovative analysis, Perez-Gonzalez (2003) showed that there was a small response of dividend payments among a subsample of firms with large individual shareholders, which is masked in the aggregate. Our analysis shows that TRA-86 generated a short-term spurt of special dividend payments concentrated among a very small number of firms but, in contrast to the 2003 tax reform, had no discernible effect on regular dividend payments.¹² Consistent with Perez-Gonzalez's (2003) evidence for TRA-86, we also find that the response to the 2003 tax reform is larger for companies with large shareholders on the board of directors.

A few very recent studies have also used the 2003 tax reform to investigate its effect on dividend policies.¹³ We discuss how our study differs, complements, or disagrees with these concurrent studies in this subsection as well as in the context of our results in section 4.

First, Blouin, Raedy, and Shackelford (2004) examined dividend payments in the three months immediately after the tax reform was passed (May 23 to August 22, 2003). They compared dividend payments in this post-reform period with dividends in the same period in 2002 (May 23 to Aug. 22, 2002) and the three month period immediately preceding enactment of the reform. Blouin et. al. concluded that virtually all the increase in dividend payments after the tax reform was due solely to 17 firms who paid special dividends, and found no statistically significant changes in regular dividend amounts. Their results differ from our results for three reasons. First, and most importantly, they focus on total dividend amounts (and

¹²We discuss reasons why TRA-86 may have had different effects than the 2003 reform in section 4.

¹³With the exception of Blouin et. al (2004), these studies were completed at roughly the same time as our own study, and were brought to our attention after we circulated our preliminary results in Chetty and Saez (2004).

then separate regular and special dividends), rather than other moments of the distribution. As emphasized above, analyzing the effect of the tax cut on regular dividend amounts on the intensive margin is a difficult statistical problem because of the large outliers that drive the means. When analyzing our data at a monthly level, we find that the surge in the *number* of regular dividend initiations and increases began precisely in the post-reform period studied by Blouin et. al. Second, they do not look back at the historical data before 2002. Again, since aggregate regular dividends are a noisy time series, it is difficult to assess the magnitude of the response induced by the tax change without making further historical comparisons. Finally, three more quarters of post-reform data have become available since their study. The additional data show that the rapid growth in regular dividend payments that began during the period examined by Blouin et. al. has continued in subsequent quarters.

Second, Julio and Ikenberry (2004) extend the influential time series analysis of Fama and French (2001) up to the first quarter of 2004. They show that the secular downward trend in the fraction of listed firms paying dividends makes a reversal starting in late 2000. Julio and Ikenberry argue that the Bush dividend tax cut cannot fully explain the reversal, as it starts well before tax reform occurred. They propose various explanations for the pre-tax rebound, including corporate accounting scandals and the maturity of technology firms. In contrast, we show that the reversal in 2000 in the fraction of publicly traded firms paying dividends is entirely due to changes in the composition of the sample due to the de-listing of many young technology firms during the stock market crash of 2000-2001. These firms generally did not pay dividends, mechanically reducing the size of the denominator and raising the fraction of payers. When controlling explicitly for these entry and exit effects, we find that the reversal in the secular decline in the number of payers takes place exactly in 2003. This result is not surprising in light of our finding that initiations surge only in 2003 while terminations remain stable.¹⁴

Finally, Nam, Wang, and Zhang (2004) show that executive ownership is correlated with dividend increases in 2003 but that there was no such relation in previous years. Their results are consistent with our findings about the importance of principal-agent issues in determining the tax response. However, they limit their analysis to executive share and stock-option

¹⁴Consistent with our results, Julio and Ikenberry (2004) also find that there was a surge in dividend initiations only in 2003 and not at the time of the 2000 reversal.

ownership compiled from Execucomp data for about 1,500 firms every year since 1992, and only to firms already paying dividends.¹⁵ In this paper, we focus on the dividend initiation margin, along which the tax response was by far the most striking. We also consider heterogeneity along other dimensions, such as large shareholders (individual and institutional). We also collect executive share and stock-option ownership for a much larger set of firms from proxy statements in order to obtain estimates for the full sample of publicly traded firms. These additional data also allow us to provide results on interaction effects between executive share ownership and the strength of principals that are not evident in the selected sample of firms listed in ExecuComp.

3 Data

We use quarterly data from the CRSP, which reports dividend, stock price, and share information for all companies listed on the NYSE, AMEX, and NASDAQ stock exchanges.¹⁶ The data we use span 1980-Q1 to 2004-Q2, the last quarter for which data are currently available.¹⁷ Following Fama and French (2001) and Auerbach and Hassett (2003), we exclude all foreign firms and all firms whose most recent industry classification is in utilities (SIC codes between 4900 and 4949) or the financial sector (SIC code between 6000 and 6999) because these companies are regulated and often have legal distribution requirements. Their dividend payments may therefore be determined by law rather than by shareholder decisions.¹⁸ The sample of firms that satisfy the preceding criteria constitute our “core sample.” The number of firms in the core sample in each quarter varies between 3,500 in the early 1980s and about 6,000 in the late 1990s (see Appendix Table A1 in and Figure 6, Panel B for a graphical depiction). There are large variations in the number of listed firms because of waves of new lists during some periods (in general during economic booms) and waves of de-listing in some other periods (in general during recessions and stock market crashes).

The large variation over time in the number of firms in the core sample raises important

¹⁵More recently, Brown, Liang, Weisbenner (in progress, no draft yet available) have also noticed that executive ownership is related to dividend initiations and increases after the tax reform.

¹⁶The NYSE, AMEX, and NASDAQ are the three major stock exchanges in the United States. Some publicly traded U.S. firms are listed on other local exchanges but they tend to be much smaller and very rarely pay dividends (based on Compustat data which contains most of those companies).

¹⁷CRSP quarterly data are generally available about 3 or 4 weeks after the end of a quarter.

¹⁸We also examined utilities and financial firms separately and our results for those firms are available upon request.

issues in the time series analysis which we describe in detail below. As we explain later, it is often useful for comparability to keep the same number of firms in each quarter. To obtain the largest possible constant-size sample of firms, we focus on a sample of the top 3,807 firms ranked by market capitalization in each quarter, which we term the “constant number of firms” sample.¹⁹

For our regression and heterogeneity analysis, we merge the constant number of firms sample with the Compustat database, losing some firms because not all firms listed in CRSP are covered by Compustat. Compustat data were available only up to 2004-Q1 when this study was completed. The left half of Table 1 gives summary statistics for the core and the constant number of firms samples between 1981-Q3 and 2004-Q1.²⁰ All dollar amounts in this and subsequent tables and graphs are in real 2004 dollars (deflated using the Consumer Price Index). We also merge our data with various other databases that contain other covariates of interest. Execucomp provides detailed executive compensation, stock and stock-option ownership for about 2,000 firms every year since 1992. Thompson Financial database provides detailed institutional ownership information. Gompers, Ishii, and Metrick (2003) provides measures of corporate governance quality for about 1,500 firms over the period 1990-2002. Dlugosz, Fahlenbrach, Gompers, and Metrick (2004) provide information on large shareholders (individuals insiders, individual outsiders, and institutions), collected from proxy statements, for about 1,500 firms for the period 1996-2001. Because Execucomp and the Dlugosz, Fahlenbrach, Gompers, and Metrick (2004) database cover only about a third of the CRSP-Compustat firms, we augment these data sources for our heterogeneity analysis by collecting some variables from SEC proxy statements, as described in Section 5.

We define regular dividends as monthly, quarterly, semi-annual, and annual taxable dividends in the CRSP data. We also reclassify “other frequency” taxable dividends as regular dividend payments when those other-frequency payments are followed by regular payments of similar magnitude.²¹ Some forms of liquidation can generate non-taxable dividend events that we ignore in this study. We define all other taxable dividends besides regular distributions as “special” dividends. More precisely, we define special dividends as the sum of special,

¹⁹3,807 is the total number of firms which meet our selection criteria in 2004-Q2, the last quarter available. For all previous, quarters, the CRSP data always contains at least 3,807 firms.

²⁰Lagged data requirements for our subsequent analysis force us to begin with 1981-Q3.

²¹This other-frequency dividends are extremely rare and thus our results are not sensitive to the way we treat them.

one-time, unspecified and other frequency dividends (those which were not followed by regular payments) in the CRSP data. Virtually all payments in our broader definition of special dividends are accounted for by CRSP’s “special dividend” category.

We define a firm as initiating regular dividend payments in quarter t if it pays positive regular dividends in quarter t and did not pay dividends in the previous four quarters. We define a firm as terminating regular dividend payments in quarter t if it paid regular dividends previously and stops paying from quarter t on. In practice, our definitions are slightly more complex to accommodate the case of annual and semi-annual payers as well as the issue of censoring (for terminations only) at the end of the sample. The exact definitions are presented in appendix.

4 Effect of the Tax Cut on Dividend Payments

Our empirical analysis is organized as follows. The first subsection examines the change in aggregate dividend amounts following the 2003 tax change and demonstrates the need to examine other moments of the dividend distribution to make reliable inferences about the effects of the tax reform. Subsections 2-4 provide such an analysis along three margins: (1) the extensive margin (initiations and terminations of regular dividend payments); (2) the intensive margin (increases or decreases in payment amounts by firms already paying); and (3) special dividends. Subsection 5 gives estimates of the contributions of each of these margins to total dividend amounts and an elasticity of dividend payments with respect to the dividend tax rate. Finally, we discuss robustness checks of the causality of the tax cut in subsection 6.

4.1 Aggregate Dividends

Figure 1 plots aggregate regular dividends for the core sample between 1981-Q3 and 2004-Q2 in real 2004-Q1 dollars (using the CPI deflator). Total regular dividends rose from \$25 billion in 2002 to a peak of almost \$30 billion at the end of 2003. Note that most of the increase takes place in the last two quarters of 2003 after the tax cut was signed into law in July, 2003. If the post-2003 increases in aggregate dividends are due exclusively to the tax cut, these values suggest that the reform has raised regular aggregate dividends from the level in 2002-Q4 by about 20%.

Unfortunately, it is difficult to determine whether this surge in aggregate dividends is tax-

driven simply by examining changes in mean dividend amounts paid by publicly traded firms. The econometric problem can be easily illustrated using data in the year around the tax reform with regressions of the following form:

$$totdiv_{i,t} = \alpha + \beta refdum_{i,t} + \gamma X_{i,t} + \varepsilon_{i,t} \quad (1)$$

The dependent variable is total dividends paid by firm i in quarter t . The regressor of interest is the reform dummy: $refdum_{i,t} = 0$ in the four quarters before discussion of the reform (2002-Q1 to 2002-Q4), while $refdum_{i,t} = 1$ in the four quarters after enactment (2002-Q1 to 2002-Q4).²² When we run this regression without controls (no X s), we obtain an estimate of $\hat{\beta} = 1.58$ (s.e. = 0.23), implying a statistically significant \$1.5 million increase in dividends per firm after the reform.²³ When we introduce a linear control for after tax earnings, $\hat{\beta} = 0.62$ (s.e. = 0.62), and when we further control for both earnings and assets, $\hat{\beta} = -0.06$ (s.e. = 0.3). These examples illustrate the fragility of the estimates of the tax effect on mean dividend amounts: The inclusion of one or two simple linear controls sharply changes the point estimate, and makes the confidence intervals for the treatment effect very wide.

The reason for this fragility is the extreme concentration of dividend payments. Figure 1, which also plots regular dividend amounts paid by the top 20 payers in each quarter, shows that the dividends from the top 20 payers account for half of all dividends paid by all firms in our core sample. The fact that this concentration is the source of the imprecision in $\hat{\beta}$ becomes evident when we change the dependent variable in (1) to dividend yield (total dividends divided by $mkcap$). In the dividend yield regressions, which are simply re-weighted versions of 1) with less weight on large firms, we obtain very stable estimates of the β coefficient that are statistically significant at the 1% level, irrespective of controls. These facts show that mean dividends are driven in large part by very few top payers, creating a small sample problem that makes statistical inference about aggregate dividends difficult. In view of this problem, we turn to other moments of the dividend distribution to obtain more credible evidence on whether the 2003 tax reform changed corporate payout behavior.

²²For simplicity, we ignore all other quarters in this exercise. However, inclusion of the full data from 1980-Q1 to 2004-Q2 along with appropriate controls for year trends does not change our conclusions: the point estimates of β remain statistically insignificant and fragile as soon as controls are introduced.

²³Standard errors reported here are clustered by quarter to allow for aggregate shocks. Standard errors under the i.i.d. error assumption are even larger than those reported here.

4.2 Extensive Margin

One intuitive way of reducing the influence of very large payers is to examine a firm’s decision to initiate or terminate dividend payments rather than looking at the amounts paid. We first examine changes in initiations and terminations, and then discuss implications for the overall fraction of dividend payers.

4.2.1 Initiations and Terminations

Figure 2 plots the fraction of initiations and terminations of dividend payments in the constant number of firms sample.²⁴ It is clear that the frequency of initiations rose when the reform was proposed (2003-Q1) and surged very sharply after it was enacted. Strikingly, the number of initiations in the 3 quarters following enactment (2003-Q3, 2003-Q4, and 2004-Q1) are the three highest among the 80 quarters we consider (see Appendix Table A2 for the full time series of initiations and other variables of interest). In contrast, the number of terminations remained very low in 2003 and did not change appreciably after the tax reform.

Table 3 summarizes the magnitude of the effect by comparing dividend initiations during a short window around the reform-period. The pre-reform period is taken as 2002-Q1 to 2002-Q4 and the post-reform period includes the four quarters after enactment, 2003-Q3 to 2004-Q2. The first row of Table 3 shows that the average number of initiations surged from 5 per quarter in the pre-reform period to 34.5 after the reform. Of course, the conclusion that this change was entirely due to the tax reform is predicated on the assumption that no other unobservable determinant of dividend payments changed contemporaneously. To examine the validity of this assumption, we evaluate the robustness of our results to the inclusion of a rich set of control variables have been identified by Lintner (1956) and summarized more recently in Brav, Gram, Harvey, and Michaely (2002).²⁵ We run the following semi-parametric regression specification for initiations:

$$Init_{i,t} = \sum_{s=1}^T \beta_s \cdot 1(t = s) + \mu^a a_{i,t} + \sum_{s=0}^8 (\mu_s^\pi \pi_{i,t-s} + \mu_s^c c_{i,t-s}) + \sum_{s=0}^8 v_s^S SIC_{i,t}^s + \varepsilon_{i,t} \quad (2)$$

²⁴The denominator is the total (and constant) number of firms in the sample, 3707. We use the constant number of firm sample because there are large fluctuations in the number of firms in the core sample and virtually all of the firms at the margin of entering or leaving the CRSP sample do not pay dividends. We return to this important point in greater detail in section 3.3.

²⁵We defer discussion of other robustness checks that verify causality to section 3.6.

where $Init_{i,t}$ is an initiation dummy which takes value 1 if firm i initiates dividend payments in quarter t and zero otherwise, $1(t = s)$ are a full set of quarter dummies. The additional firm-level covariates are: (1) total current assets, $a_{i,t}$; (2) the level and eight lags of quarterly after-tax earnings, $\pi_{i,t}$ and cash holdings, $c_{i,t}$; and (3) First-digit SIC industry dummies, $SIC_{i,t}^s$ that indicate whether the first digit of firm i 's SIC code is s in 2004.

Figure 3 shows that the surge in initiations is extremely robust to adding these controls by plotting the $\{\beta_s\}$ coefficients from the regression along with the mean estimates of initiation rates displayed in Figure 2.²⁶ It is clear that adding controls has a very small effect on the pattern of the initiation rates, and does not change at all our finding of a surge in dividend initiations after the reform. Therefore, the surge in initiations cannot be explained by increases in after-tax profits, cash holdings, or assets in the post-reform period. In addition, we examine whether the recent “catering theory” of dividend initiations proposed by Baker and Wurgler (2000) may explain our results. We find that their leading measure of the markets’ preference for the dividends – the dividend premium, which is defined as the log difference in market to book ratios for dividend payers and non-payers – does not predict the recent surge.²⁷ Hence, the unprecedented surge in initiations that takes place exactly when the 2003 reform was enacted constitutes very strong and robust evidence that the dividend tax cut caused a surge in dividend initiations.

Our finding that regular dividend payments rose sharply after the 2003 tax cut contrasts with the conclusions of an earlier study by Blouin, Raedy, and Shackelford (2004), who examined dividend payments in the three month period immediately after the reform (May 23 to Aug. 22, 2002). They document a surge in special dividends, but conclude that there is no increase in regular dividends during this period because the standard errors on the tax reform dummy in their dividend *amounts* regressions are too large to reject the null hypothesis of a zero effect. As we discussed in section 3.1, consistent with the Blouin et. al. findings, we also find that the standard errors on the amounts estimates becomes very large once covariates

²⁶The regression estimates end in 2002-Q1 because Compustat data are not yet available for 2004-Q2.

²⁷This is because the dividend premium fell sharply during the dot-com boom and rose back to its original level during the subsequent dot-com bust. We verify that this temporary fluctuation does not predict the surge in initiations a year later by regressing the initiation rate on the dividend premium and finding that the residuals from this regression spike up sharply after the tax reform. Note that we cannot directly include the dividend premium in the semi-parametric specification in (2) because there is no within-quarter variation in the dividend premium.

are included, even with the additional data now available through 2002-Q1. However, our conclusion from these results is that mean amounts are too unstable to yield reliable estimates of the effect of the tax cut on dividend behavior, and that other, more stable moments of the distribution of dividend payments must be examined to assess the tax reform’s effects more informatively.

To contrast our results with Blouin et al. (2004) further, we examine the data at a monthly frequency in the months around the passage of the reform. Figure 4 plots the number of initiations per month between 2001 and 2004. It is clear that the surge in initiations occurred shortly after the reform was enacted, during the three month period examined by Blouin et. al. Hence, although the addition of three more quarters of data has made the increase in regular dividend payments after the tax cut clearer, the primary reason that our conclusions differ from those of Blouin et. al. is the difference in methodology. Changes in regular dividend amounts are difficult to detect because of the extreme values problem, but changes in the number of payers are much easier to see.

4.2.2 Fraction of Payers

We expect the surge in initiations in the post reform period accompanied with no increase in terminations to lead to an increase in the fraction of firms paying dividends. This is confirmed in Figure 5 which plots the fraction of dividend payers in the constant number of firms sample between 1981-Q3 and 2004-Q2. As discussed in Fama and French (2001), the fraction of dividend payers has declined steadily over the past two decades, from more than 40% in the early 1980s to less than 20% in 2000.²⁸ The decline in the fraction of payers stops precisely until the last quarter of 2002, at which point the fraction of payers begins to rise. Figure 5 also plots the tax preference parameter computed by Poterba (2004), which equals the net return to investors from a dollar paid in dividends instead of capital gains.²⁹ As expected, the only large, abrupt change in the tax preference parameter during the sample period occurs at the end of 2003, after which dividend payments become start to become more common.

²⁸DeAngelo, DeAngelo, and Skinner (2003) emphasize that while the number of payers among publicly traded firms has fallen, dividends are not “disappearing” because total aggregate dividends have actually risen (as shown in Figure 1). This is because the distribution of dividend payments is more concentrated now than it was in 1980.

²⁹Formally, the tax parameter is defined as the dollar weighted average of $(1 - \tau_{div})/(1 - \tau_{cg})$ where τ_{div} is the marginal tax rate on dividend income (including non-taxable dividend income earned through tax preferred accounts such as pension funds) and τ_{cg} is the marginal tax rate on capital gains.

As mentioned in Section 2.2, the recent study by Julio and Ikenberry (2004) argues that the reversal in the fraction of firms paying dividends takes place in late 2000 rather than in 2003 and hence cannot be attributed to the tax reform. It is therefore critical to understand the difference between their findings and ours. Let us start with Julio and Ikenberry's (2004) evidence. Figure 6, Panel A displays the fraction of regular dividend payers in the core CRSP sample and for the top 1,000 firms (ranked by market capitalization in each quarter). Indeed, for those two samples, the reversal takes place in 2001-Q1 and 2000-Q2 respectively.

Figure 6, Panel B displays the time series of the total number of firms as well as the total number of regular dividend payers in the core CRSP sample. The total number of dividend payers starts to increase (after a secular decline) only in 2003-Q1, exactly when the tax reform takes place. However, the number of firms in the core sample falls precipitously starting in 2000-Q4 (from 5,306 in 2000-Q3 to 3,807 in 2004-Q4), exactly at the time the reversal takes place for the full sample on Panel A. Only 2% of the 2,000 firms which exit the core CRSP sample from 2000-Q4 to 2004-Q4 are dividend payers. Thus, what drives the Julio-Ikenberry reversal for the full sample is a fall in the denominator (total number of firms) and not an increase in the numerator (number of payers).

In the case of the top 1,000 firms, the denominator is fixed, and hence this clearly cannot explain the Julio-Ikenberry early reversal effect. Figure 7 explores composition changes among the top 1,000 firms. It plots, for each quarter, the number of entrants which are regular dividend payers and the number of leavers which were regular dividend payers. The graph shows that there are more dividend payers which leave the top 1,000 group in 1998 and 1999 than dividend payers which enter the sample. In 2000-2002 the situation is reversed: more dividend payers enter the sample than dividend payers leave.³⁰ Through this composition effects, the number of dividend payers among the top 1,000 falls quickly in 1998 and 1999 and then recovers in 2000-2002 explaining the Julio-Ikenberry reversal effect depicted on Figure 6, Panel A.

Figure 8, Panel A makes this point more formally. The first graph depicts the number of payers among the top 1,000. The second graph depicts, the cumulative (back from 1982-Q1)

³⁰The spike in dividend leavers is due to the surge in the stock prices in 1998 and 1999 of new technology firms (never paying dividends) which enter the top 1,000 and displace older and more traditional firms (which often pay dividends). Symmetrically, the spike in entrants is due to technology stock market crash in 2000-2002 during which new technology firms are displaced by more traditional firms in the top 1,000.

difference between the number of regular dividend payers who entered the top 1,000 firms and the number of regular dividend payers who left the top 1,000 firms.³¹ This graph captures the change in the number of dividend payers due to changes in the composition of the top 1,000 firms sample overtime. As described above and as is clearly visible on the Figure, this net change falls in 1998 and 1999 and then rebounds in 2000-2002. Finally, the third graph depicts the difference between the first two graphs. This graph captures the number of payers among the top 1,000 firms controlling for entry and exits effects, and therefore is labelled the number of “deliberate” payers. The number of deliberate payers is declining (slowly) up to 2002-Q4 and starts increasing exactly in 2003-Q1, at the time the reform takes place. From 2002-Q4 to 2004-Q2, the increase in the number of deliberate payers is about 10%.

Figure 8, Panel B graphs the number of deliberate payers for our two samples of interest: the core sample (all firms in the CRSP which meet our criteria) and the constant number of firms sample (the top 3,807 firms in each quarter ranked by market capitalization). For those two samples as well, once we control for composition effects, the number of “deliberate payers” starts to increase in 2003-Q1, when the reform takes place and this increase accelerates in 2003-Q3, after enactment. The increase in the fraction of deliberate payers after the reform is substantial and around 10-12% for the two groups.

Therefore, the early reversal findings of Julio-Ikenberry can be fully explained by composition effects. Once those composition effects are controlled for, the reversal takes place exactly after the 2003 reform is implemented. Those results are fully consistent with the surge in dividend initiations that we documented earlier. It is notable that for our constant number of firms sample (the top 3,807 firms in each quarter), composition effects cancel out and the timing and size of the surge in the number of payers and deliberate payers are almost identical.³² This important remark justifies our focus on this group as a simple but valid way to control for entry and exit effects.

³¹This graph is equal to the integral of the difference between the two graphs (dividend payers entering and dividend payers leaving) depicted on Figure 7.

³²This can be seen formally in appendix Table A2 which displays quarter by quarter the key statistics for the constant number of firms sample, including the number of dividend payers among entrants and leavers.

4.3 Intensive Margin

Given the extreme values problem that plagues the analysis of amounts, we begin our study of the intensive margin by examining the effect of the tax cut on the probability that a firm increases or decreases dividend payments. We consider several different cutoffs to define an increase or decrease, ranging from a minimum of 0 percent (where all changes are counted as either increases or decreases) to a maximum of 50%.³³ It turns out that the cutoffs used to define increases and decreases matter little for the results; we report results for the 20% cutoff because these changes are both relatively frequent and sufficiently large that they are likely to signal a substantial shift in a corporation's distribution policy. In order to avoid double counting, initiations (terminations) are not counted as dividend increases (decreases). The appendix gives the exact definition of increases and decreases we use.

Figure 9, Panel A, plots the fraction of firms in the constant number of firms sample that increased or decreased dividends by 20% or more along the intensive margin. There is a sharp surge in the number of firms which increase dividends when the tax cut is enacted in 2003-Q3. The number of these large intensive margin increases jumped from 22.5 in the pre-reform period (2002-Q1 to 2002-Q4) to 60.5 per quarter in the post-reform period (2003-Q3 to 2004-Q2), as shown in Table 3. Analysis of the data at a monthly frequency (not reported) shows that the pattern of dividend increases coincides very closely with the pattern of dividend initiations. In particular, it began in the three month period immediately after the reform examined by Blouin et. al., and remains strong through the end of the sample period. Meanwhile, the frequency of dividend decreases remained small and essentially unchanged after the tax cut.

Figure 9, Panel B shows that controlling for observable variables from Compustat does not modify our conclusion that this increase was tax-driven. The coefficients plotted in this Figure are obtained by running a regression analogous to (2) with an intensive increase dummy as the dependent variable. It should be noted, however, the evidence of a tax effect on the intensive margin is weaker than that for initiations because there were periods in the 1980s where the fraction of firms increasing dividend payments was higher than in the post-reform period.

Figure 10 gives a more complete view of the changes in dividend behavior on the intensive margin by displaying various percentiles of the dividend distribution among the top 3,807

³³Increases and decreases are defined using nominal rather than real values since we want these variables to reflect active decisions by firms rather than changes in the inflation rate.

firms (including the zeros). The level of each percentile has been normalized to one in 1998-Q1. There is clear evidence of a sharp increase in dividends for all percentiles below the percentile 99.5. The noise in the 99.5 percentile is so large that it is impossible to determine whether the changes after the reform are anything more than a random fluctuation. But the 99.5 percentile is very important for amounts, given the concentration of dividend payments: About half of all dividends are paid out by the top 0.5% dividend payers. The fact that the amounts are driven to a significant fraction by a few big payers whose aggregate dividend payments fluctuate sharply over time explains why it is so difficult to obtain reliable estimates of the effect of taxes on mean amounts. It also underscores the importance of examining other, more stable moments of the dividend distribution. If one assumes that the behavioral changes at the top 0.5% follow the same pattern as the behavioral changes in lower percentiles, one can infer that the recent surge in total dividend amounts was indeed tax-driven.

4.4 Special Dividends

We now turn to special, one-time dividend distributions. Figure 1 plots the total amounts of special dividends paid out. Special dividend amounts increased after enactment of the reform but there are other periods (such as the late 1980s) when special dividends were substantially higher.

Figure 11 plots the fraction of special dividend payers in the constant number of firms sample. There is a clear uptick in the fraction of special payers immediately after the reform, and this change is robust to the inclusion of controls as above. As shown in Table 3, an average of 23.5 firms paid special dividends in each of the quarters following enactment, significantly greater than the average of 7.75 per quarter in 2002. However, there are an average of 40 special dividend payments per quarter in the entire sample between 1981 and 2003. Hence, while the number of special payments rose after the reform relative to the recent past, it does not exceed the level of special payments in earlier periods such as the late 1980s and early 1990s.³⁴

³⁴This is consistent with the findings of DeAngelo, DeAngelo, and Skinner (2000), who document a decline in the frequency of small special dividend payments over the past two decades.

4.5 Changes in Amounts and Elasticity Estimates

How much did each of the three margins discussed above contribute to the surge in aggregate dividends? To answer this question, we first calculate the cumulative amount of dividends raised through initiations and the cumulative amount of dividends lost through terminations over our sample. We then take the difference between total regular dividends and net cumulated extensive margin dividends (initiations less terminations) to obtain cumulated intensive margin dividends in each quarter.³⁵ Since cumulation becomes difficult when firms exit the sample, we restrict our analysis in this subsection to a “selected sample” of the firms in the core sample who are alive in the 2004-Q2 CRSP, the final quarter for which we have data.³⁶

Figure 12 plots the time series of cumulated amounts along the three margins for the selected sample. As shown in Table 3, the average cumulative extensive amount over the four quarters in the post-reform period (2003-Q3 to 2004-Q2) was approximately \$1.5 billion dollars higher than in the pre-reform period (2002-Q1 to 2002-Q4). This change is an extremely large value relative to past changes. Approximately half of the \$1.5 billion increase came from the dividend initiation by Microsoft in 2003-Q1.³⁷ The \$1.5 billion estimate is robust to the inclusion of the set of controls in (1), and remains statistically significant at the 1% level irrespective of the controls that are included. We are able to make precise statistical inferences about the effect of the tax cut on amounts from the extensive margin (unlike any other margin) because the distribution of dividends from initiations is relatively dispersed. Dividend payments from initiations are not extremely concentrated because most large firms were already paying prior to the reform, putting them on the intensive margin.

Total cumulated dividends from the intensive margin also surged sharply between 2002-Q4 and 2004-Q2. Table 3 shows that the point estimate of the change in average payments on the intensive margin between the pre- and post-reform periods is \$2.1 billion. However, as with total dividends, this time series is driven by a few large payers. Hence, estimates of the effect of the tax cut on amounts from the intensive margin are very sensitive to the set of controls that are included, and are not always statistically significant.

³⁵Since special dividends are one time distributions, we do not have to cumulate these, and can simply examine the change in special dividend amounts around the reform.

³⁶The growth in the size of this sample over time could potentially bias our results; however, the sample size grows smoothly and slowly, whereas the reform creates sharp, discontinuous effects, making this bias relatively small in magnitude.

³⁷The amount lost through terminations is extremely small and is not reported.

Finally, special dividend payments are on average \$0.5 billion per quarter higher in the quarters including and after 2003-Q3 relative to the four quarters in the 2002 pre-reform period. However, this increase is driven by a very small set of firms, as noted by Blouin et. al. (2004). More than 80% of the increase is accounted for by eight payers who made special dividend payments in excess of \$100 million in one of the quarters after the reform was enacted. More than 30% of the increase is driven by telecommunications giant Southwestern Bell Corporation, which made two special dividend payments of approximately \$335 million each in 2003-Q3 and 2003-Q4. Hence, if regular dividend payments remain as persistent as they have historically, special dividend payments are likely to be a minor blip in the time series relative to the change in regular dividend amounts induced by the 2003 tax reform.³⁸

The changes along the extensive and intensive margins add up to a total regular dividends increase of \$3.4 billion on average in the four post-reform quarters relative to the four pre-reform quarters. This figure understates the full dividend response insofar as the adjustment of dividend policies was occurring during the four quarters after the reform (as shown by the upward trend in regular dividends during this period). To account for seasonality, our best estimate of the long-run change in dividends given the adjustment that has taken place to date is the difference in total dividends between 2004-Q2 and 2002-Q2, which is \$4.4 billion in this sample. Starting from a base of \$23.8 billion in 2002-Q2, total regular dividends have therefore risen by approximately 19% for our sample of non-financial, non-utility publicly traded firms. Note that the short-run increase in dividends exceeds 19% because of the surge in special, one-time distributions.

According to calculations by Poterba (2004), the average tax rate on dividends (including both taxable and non-taxable dividends distributed directly or indirectly to individuals) fell from 29% to 17%, a 40% reduction. Therefore, the implied elasticity of dividend amounts with respect to the dividend tax rate is roughly -0.5. This implies that the tax revenue from dividend taxation that was lost because of the tax cut is only 50% of the revenue loss assuming no behavioral response.³⁹

³⁸If one were examining the data up to 2003-Q3 – as do Blouin et. al. (2004) – one would correctly conclude that special payments had a much larger effect than changes in regular dividends on total amounts *until that point*. The large cumulative effect of the changes in regular dividend amounts is fully evident only with the data now available through 2004-Q2, even though the fact that regular payments had begun to surge was clear by 2003-Q3.

³⁹However, it is possible that the increase of dividends paid out reduces other forms of taxable income such

4.6 Other Events and Robustness Checks

As discussed above, our identification strategy relies critically on the assumption that no other event in the economy apart from the tax cut produced a surge in dividend payments exactly at the same time as the tax cut. Many corporate scandals took place in 2001-03 and were widely discussed in the press and in the political sphere. Those scandals originated mostly from serious accounting fraud among large and well known corporations such as Xerox, Enron, WorldCom, etc. Those scandals have created distrust among shareholders about management of large US corporations in general. Therefore, the scandals might have increased the signalling value of dividends for shareholders who might have pressured management to increase dividend payments, even in the absence of the tax cut. It is possible that corporate scandals might have increased the extent of the response to the tax cut but we doubt that they can have caused the surge in dividends to take place independently of the tax cuts for three reasons.

First, the most publicized scandals appeared in the press during 2001 and the early part of 2002.⁴⁰ while the surge in dividend initiations takes off in the 2003-Q3, exactly after enactment of the tax cut. Therefore, the timing points toward the tax explanation rather than the corporate scandal explanation.

Second, we have also used Compustat data for Canadian corporations in order to perform a placebo test. Canadian corporations are not affected by the tax cut unless they are owned by U.S. individuals. Although U.S. individual ownership of Canadian corporations is not trivial, it is nonetheless small relative to U.S. individual ownership of U.S. corporations, making Canadian corporations a potentially useful control group. Figure 13 plots the fraction of U.S. and Canadian firms initiating dividends in each quarter from 1994-Q1 to 2004-Q1. In sharp contrast to the United States, Canadian firms do not display a surge in dividend initiations around the 2003 reform. Therefore, if shocks such as corporate scandals have affected corporations in Canada in a similar way as in the United States, the evidence from Figure 13 suggests that the surge in dividends in the United States was indeed tax driven.

Third, we have also examined the press releases of the firms that initiated dividends after the reform was enacted and find that more than a quarter of the firms explicitly cite the tax

as realized capital gains from share repurchases. It is critical to assess the effect of the tax change on total tax revenue (and not only revenue from taxing dividends) in order to assess the deadweight burden of taxation (see Saez, 2004 for a recent exposition of this point).

⁴⁰Enron's scandal appeared in October 2001, WorldCom's in March 2002, and Tyco's in May 2002.

cut as one of their motives for initiating dividends in their first announcement. This figure is likely to greatly understate the actual number of tax-motivated dividend changes because firms have strong incentives to avoid attributing their dividend decision to the tax cut, instead claiming that they are raising dividends given signs of strong future earnings.

A promising avenue for future research would be to compare closely held corporations from subchapter C (facing the corporate income tax on their profits as publicly traded companies do) to subchapter S corporations (which do not face the corporate tax and whose profits are taxed directly at the individual level and which are not affected by the 2003 reform). In contrast to publicly traded corporations, closely held corporations are not required to publicly report their accounting balance sheets and dividend payments. Therefore, such a project would require using non-public corporate tax return data, available through the Treasury or the Internal Revenue Service.

Finally, looking at the figures we have presented, it is interesting to note that there does not seem to be a systematic response of dividend payments following the sharp cut in top individual tax rates (from 50% to 28%) following the Tax Reform Act of 1986 (TRA-86). The number of initiations, or intensive-margin increases did not appear to change significantly. These results are consistent with the results Bolster and Janjigian (1991) who report no evidence of regular dividend increases after TRA-86. However, from Figure 1, TRA-86 does appear to have generated a temporary surge in the total *amount* of special dividends in the late 1980s. The increase in the amount of special dividend payments following TRA-86 was actually much larger than after the 2003 tax reform. These results are also consistent with the large but short-term surge in dividend income reported on high income individual tax returns just after TRA-86, as documented in Piketty and Saez (2001).

It is striking that a permanent tax change such as TRA-86 created only a short-term response along the special marginal while the 2003 tax change which might not be a permanent change has generated substantial increases in regular dividends which are likely to be long-term. Further research is required to determine why the 2003 reform had very different effects than TRA-86. Candidate explanations include: (1) TRA-86 changed the tax rate on interest and dividend income simultaneously, perhaps inducing broader shifts in capital structure toward debt, making increased dividends undesirable; (2) average cash holdings were unusually high before the 2003 reform relative to prior years, giving firms the resources necessary to raise

dividends; (3) highly publicized cases of corporate mismanagement such as Enron may have raised the signal value of dividends, giving firms a strong reason to raise dividends as soon as the cost of doing so was lowered.

5 Which Firms Responded to the Tax Change?

In this section, we document two important forms of heterogeneity in the dividend response that shed light on the mechanism of the tax response. First, we show that the response was strongest in firms that had the smallest divergence of interests between principals and agents. On the agent side, we find that firms with high executive share ownership and low executive stock-options holding were most likely to initiate dividend payments. On the principal side, firms with large share ownership from independent directors and high institutional ownership responded very strongly to the tax cut. Hence, existing “old view” and “new view” models of corporate taxation in the public finance literature appear to miss an important element of the behavioral response to taxation by abstracting from agency problems.

Second, we attempt to provide some suggestive evidence about the efficiency effects of the tax cut. Of course, the fact that the tax cut caused a sharp surge in dividend payments does not itself imply that the efficiency of capital allocation was improved. The ideal way to estimate the efficiency effects of the tax cut would be to directly identify its effects on investment and profits. Unfortunately, this approach is infeasible because both investment and profit are very volatile at the firm and aggregate level, making it difficult to detect whether changes in behavior along those margins are associated with the tax cut. We provide indirect evidence of the improvement in capital allocation by showing that firms with high forecasted earnings growth did not respond to the tax cut. This suggests that funds might have been channelled away from lower growth firms toward those with better investment opportunities through external capital markets.

In addition to these cuts, we also briefly discuss heterogeneity along a large set of other dimensions, such as profits, assets, cash holdings, age, debt levels, and corporate governance indices.

5.1 Self-serving agents: Executive share and stock-option ownership

A large literature in corporate finance has focused on the tension between principals' (shareholders) objectives and agents' (executives) interests. One hypothesis that has received substantial attention is that high degrees of pay-for-performance sensitivity, e.g. from large executive stock and options holdings, can have significant effects on executives' decisions about corporate policy. In this subsection, we analyze the impact of executive share and options holdings on the payout response to the tax cut.

We try to test for such an association without imposing strong functional form assumptions on the data, since the relevant effects could be non-linear. We use a semi-parametric strategy of classifying firms into quintiles based on executive share and option ownership, and comparing the size of the dividend response across the quintiles. As in the preceding analysis of the overall dividend response, we must be careful to address biases that arise from changing sample composition during the dot-com boom and bust. Therefore, in this and all subsequent heterogeneity analyzes, we restrict attention to the set of 2,551 firms that are alive between 1998-Q1 and 2004-Q2.⁴¹

Our primary data source for the share ownership and options data is ExecuComp. The shortcoming of ExecuComp data is that it covers only about one-third of the companies listed in CRSP, and these companies are not a random subsample of the CRSP firms. In particular, ExecuComp tends to cover only larger firms, which have a higher propensity to pay dividends and differ from uncovered firms along many other dimensions (e.g. large shareholder ownership) as well. To improve the precision of our estimates and obtain results that apply to the full universe of publicly traded firms, we expanded our data on share ownership by hand-collecting data for an additional 230 firms from SEC proxy filings. The 230 firms include all the firms that initiated dividends, which are of greatest interest for the present study, as well as an additional 121 firms that constitute a 10% random sample of the non-ExecuComp firms that did not initiate dividends within our 1998-2004Q2 sample frame. The construction of this random sample is described in detail in the appendix. We use sampling probability weights to account for the under-representation of non-ExecuComp non-initiating firms in our

⁴¹We chose a relatively long pre-reform time frame (1998-2003) in order to make the total number of dividend initiations in the pre-reform period similar to that in the post-reform period. We focus primarily on heterogeneity in dividend initiations here. Results for dividend increases are generally quite similar.

sample for all the estimates that use data on share and option ownership.

An executive who holds a large stake in his company experiences a large change in his personal tax burden from a dividend payment, since a considerable fraction of the total dividend payout would accrue to the executive himself.⁴² At the other extreme, the personal tax incentives of an executive who owns no shares are unchanged by the 2003 reform. To analyze whether the personal tax burden of executives has an impact on the tax response of corporations, we classify firms into five quintiles of executive shareownership as follows. We first identify the largest shareholder among the company's executives in a given year. We then define a stable set of quintiles using the average fraction of shares held by the largest executive shareholder during our sample frame if the firm does not initiate dividends during this period, and using share ownership as the time of initiation if the firm does initiate dividends. This procedure ensures that firms do not move across quintiles over time. The advantage of having a stable set of firms in each quintile is that it eliminates the bias that can arise if the distribution of executive share ownership changes in a manner that is correlated with dividend behavior.⁴³

Figure 14A shows the frequency of initiations among non-payers across the five quintiles of executive share ownership in the pre- and post-reform periods. The pre-reform period is defined as 1998-Q1 to 2002-Q4 and the post-reform period is 2003-Q1 to 2004-Q2. Initiations surged much more sharply in firms where at least one executive owned a substantial fraction of the company's shares.⁴⁴ The importance of executive share ownership is striking. The annual initiation rate post-reform among firms in the highest quintile of executive share ownership is 12%, in contrast with 0.68% in the lowest quintile. The difference between the change in the initiation rate in the fifth quintile and the first quintile is statistically significant at the 1% level (see Appendix Table A3 for means and standard errors for each quintile). The pattern

⁴²It can be difficult for top executives in publicly traded firms to obtain cash by selling directly their shares because selling shares has to be publicly reported and is likely to be interpreted as a negative signal by the market. Previous studies have found mixed results on the correlation between large executive ownership and dividend payments. Rozeff (1982) found no correlation but the most recent study by Fenn and Liang (2001) found a positive correlation. Those studies, however, do not use tax changes to identify this link.

⁴³The disadvantage of this method is that it makes it more difficult for us to detect heterogeneous effects if firms' growth prospects fluctuate sharply within our sample frame (so they really are moving across quintiles sharply). We attempt to reduce the magnitude of this problem by classifying initiators into the appropriate quintile based on earnings growth when they initiated dividends.

⁴⁴The share holdings of all other executives besides the largest executive shareholder are unrelated to the dividend tax response.

for dividend increases (not reported) is also quite similar.⁴⁵

In order to control for other covariates that may also influence the dividend response to the tax cut, we run a regression analogous to (2), linearly interacting each of the covariates and the five quintile dummies of interest with a tax reform dummy, d_T .⁴⁶

$$Init_{i,t} = \sum_{T=0}^1 \left\{ \sum_{j=1}^5 \beta_{T,j} d_T * q_{shrown_{i,t}}^j + d_T * X_{i,t} \right\} + \varepsilon_{i,t}$$

The coefficients on the quintile dummies interacted with the tax reform dummy, $\{\beta_{1,j}\}$ reveal the heterogeneity in the dividend response along the executive share ownership margin, conditioning on the possible heterogeneity of responses along the other observable margins. These estimates are reported in Appendix Table A4. The pattern and statistical significance of the regression coefficients is essentially unaffected by the inclusion of covariates, suggesting that executive share ownership is indeed causally associated with the dividend response to the tax cut.

Next, we examine the effect of unexercisable stock-options holdings by top executives on the tax response. Lambert, Lanen, and Larker (1989) noted that executives with large options holdings are hurt by dividend payments, because the strike prices of their options are not adjusted for dividends.⁴⁷ By paying money out of the firm and thereby reducing the price of the shares outstanding, executives make their unexercised options less valuable. To examine whether these incentives matter for the tax response, we follow the same methodology as above and classify firms into five quintiles based on the unexercisable options holdings (as a fraction of total shares outstanding) of the executive who owns the largest number of such options.

Figure 14B shows that firms where one or more executives had a large *unexercisable* option holding were significantly less likely to respond to the tax cut. The annual initiation rate was

⁴⁵In independent work, Nam, Wang, and Zhang (2004) and Brown, Liang, and Weisbenner (in progress), have also identified a relationship between executive ownership and dividend increases after the tax cut using ExecuComp data. Our hand-collected data permits a more precise characterization of the non-linear effect of executive shareownership on the tax response, and allows us to analyze the interaction between agent and principal incentives, as discussed in section 6.3.

⁴⁶Less parametric regressions with quintile dummies for all the covariates generally yield the same pattern of coefficients; however, the large number of coefficients causes the standard errors to rise relative to our more parsimonious linear specification for controls.

⁴⁷More recently, Fenn and Liang (2001) and Weisbenner (2000) have shown, that there is a negative relation between the number of stock options owned by management and dividend payments and a positive one between options and share repurchases. This suggests that firms where top executives own many stock options are substituting dividends for share repurchases. Those studies, however, do not use tax changes to identify those links.

8.4% in the lowest quintile of options holdings, in contrast with 4% in the highest quintile. These differences are statistically significant at the 1% level (Table A3), and are robust to controls based on a specification analogous to (3), as shown in Table A4. Consistent with the hypothesis that only unexercised option holdings affect executives' incentives, we find no relationship between executives' *exercisable* options holdings and the tax response.

Table 4a illustrates the interaction between executive incentives through share and option holdings by cross-tabulating the post-reform initiation rate by three quintiles of share ownership and unexercisable options ownership. Only 1% of the firms in the lowest quintile of share ownership and highest quintile of option ownership initiated dividends in the six quarters after the reform. In contrast, 21% of the firms at the other extreme – highest quintile of share ownership and lowest quintile of options – have initiated dividend payments since that point.

Despite the fact that the variation in share and options holdings is purely cross-sectional, it is difficult to formulate a non-agency story that would explain the share ownership, unexercisable options, and exercisable options results simultaneously. In short, there is strong evidence that executives' behave in a self-serving manner when making decisions about corporate payout policy for their shareholders.

5.2 Powerful principals: Directors and institutional shareholders

We now turn to the other side of the principal-agent relationship, and examine the effect of having powerful principals on the response to the tax cut. An extensive literature in corporate finance has found an association between the presence of large individual and institutional shareholders and the degree to which firms behave in value-maximizing fashion (see e.g. Morck, Shleifer, and Vishny 1988 and Bertrand and Mullainathan 2003). To analyze the impact of these variables on the dividend response, we quantify the power of principals in three ways: the number of independent (non-officer) directors with large share holdings (over 5% of shares), the number of non-director large shareholders, and the percent of shares controlled by institutions (e.g. mutual funds, trusts, banks, etc.).

We obtain data on institutional ownership from Thompson Financial's Institutional Ownership database, which covers nearly 90% of the firms in our sample. Our primary data source for the number of large shareholders is a dataset compiled by Dlugosz et. al. (2004), who provide a publicly available dataset that corrects a series of mistakes in Compact-Disclosure data

on large shareholders that is compiled from firms' SEC filings. Since this dataset covers only the firms tracked by the Investor Responsibility Research Center (roughly the 1,500 largest companies in the U.S.), we augment this dataset by hand-collecting information from proxy statements for an additional set of firms. We follow the same methodology as for the executive share ownership data, collecting data for all the firms that initiated dividend payments and a 10% random sample of non-IRRC, non-initiating firms. With appropriate sampling probability weights, these additional data allow us to obtain estimates for the full universe of publicly traded firms.

We begin by analyzing the impact of large-shareholding directors on the tax response. We classify firms into three categories: no independent large-shareholding directors, an average number of such directors over the sample frame less than 1, and an average number above 1.⁴⁸ Figure 16A shows that firms with independent directors holding large stakes are significantly more likely to respond to the reform by initiating dividends. Tables A3 and A4 shows that the differences across the categories are statistically significant both with and without controls. The pattern for dividend increases is again very similar to the pattern for initiations. Hence, the tax elasticity of dividend payments is much larger if there are powerful principals on the board whose personal tax incentives changed significantly with the reform.

We find a similar relationship between institutional ownership and dividend payouts. We classify firms into five quintiles based on the average fraction of shares held by institutions over the sample frame. Figure 16B shows that firms with very high levels of institutional ownership are much more responsive to tax incentives. The statistical significance and robustness of this conclusion to controls are again confirmed in Tables A3 and A4. These findings suggest that institutional owners increase their demand for dividends from the corporations in which they invest after the tax reform, and that corporations respond to these demands. More generally, they are consistent with the results of other studies which show that the presence of institutional owners makes corporations more sensitive to incentives.

Table 4b illustrates the interaction between executive incentives and the power of principals. It cross-tabulates three quintiles of the ratio of executive stock to option holding by three quintiles of institutional ownership. Only 0.36% of the firms in the lowest quintile of share

⁴⁸There is insufficient variation in the number of large-shareholding directors to split the data into five quintiles.

ownership and institutional ownership initiated dividends in the six quarters after the reform. In contrast, more than 22% of the firms at the other extreme – highest quintile of share ownership and institutional ownership – have initiated dividend payments since that point. Firms respond to the tax change only if executives find it in their interest to do so, or powerful principals make them do so.

In sum, heterogeneity analysis reveals that principal-agent issues play a first-order role in determining behavioral responses to taxation. The fact that agents withheld distributions of earnings because of high tax rates also provides indirect evidence that the dividend taxes reduce the efficiency of capital allocation. The firms with the least severe principal-agent problems...Since the interests of the self-serving executives and the shareholders are more likely to be aligned when executives own many shares, the strong response among these companies suggests that the dividend tax induced value-maximizing firms to retain excess earnings beyond the level they would choose in a tax-free environment.

Unlike directors and institutions, large “outside” shareholders, have no effect on the response to the tax cut, along either the extensive or intensive margins (see Tables A3 and A4). The most likely reason for this is that dividend policy is set directly by the board of directors and is not typically voted upon by shareholders. Hence, large external shareholders may not have much direct influence over the payout decisions of corporations.

5.3 Capital allocation efficiency: Forecasted earnings growth

We now examine whether there is any evidence of an efficiency improvement in capital allocation associated with the 2003 tax reform. To do so, we test whether there is an association between forecasted growth prospects and the dividend response to the tax cut. We define forecasted growth prospects using I/B/E/S data on analysts’ earnings forecasts as follows. We first compute the expected change in earnings per share as the mean earnings per share forecast for a two year forecast period minus the actual earnings per share in the current year. We then multiply this figure by the total number of shares outstanding and divide by total assets to arrive at a normalized measure of earnings growth per dollar of assets.⁴⁹ Finally, we compute five quintiles of earnings growth over the sample of firm-quarter pairs where the

⁴⁹We obtain similar results when defining earnings growth as a simple percentage change in EPS; the advantage of normalizing by assets is that it permits us to include the many firms that have negative forecasted and actual EPS values.

firm was not previously a dividend payer (and is therefore a candidate to initiate dividend payments).

Figure 16 shows the frequency of initiations among non-payers across the five quintiles of forecasted earnings growth in the pre- and post-reform periods. The effect of forecasted growth appears to be slightly non-linear, consistent with the hypothesis that firms that have less need for cash respond more to the tax cut. Some of the firms in quintile 1 are in distress, as their earnings are expected to fall sharply, so they respond less on average than those in quintile 2, who have more moderate earnings forecasts. Firms with the best growth prospects (quintile 5) responded very little to the tax cut. As shown in Table A3, the differences between fifth quintile and lower quintiles are highly statistically significant. These results are robust to the inclusion of our standard set of covariates. This is shown on Table A4, which displays the coefficient estimates from a semi-parametric regression analogous to (3).

These results provide suggestive evidence that the dividend tax cut improved the efficiency of capital allocation in the economy. In particular, the capital market seems to have extracted funds from lower growth firms.⁵⁰ A large set of studies have argued that free cash flow within such firms is not always put toward value-maximizing ventures because of principal-agent problems (see e.g., Jensen 1986, Rajan, Servaes, and Zingales 2000, Scharfstein and Stein 2000). Since the reduction in dividend taxes reduced executives' incentives to hoard earnings, the funds released from these lower-growth firms are likely to have been redirected by external shareholders toward other ventures with equal or greater expected value.⁵¹

5.4 Other Cuts

We have also examined the heterogeneity of the tax response along several other dimensions. Some of these results are summarized in Appendix Tables A3 and A4. Unsurprisingly, we find that the tax response was stronger among firms that are in healthy, stable financial condition, i.e., those with higher levels of profits and assets and lower levels of debt. More interestingly, cash holdings are unrelated to the dividend response, contradicting the “new view” prediction that firms with high levels of cash holdings should not have changed payout policies after the

⁵⁰We show in section 6 that the dividend response appears to reflect an increase in total payout, not just substitution between share repurchases and dividends.

⁵¹We cannot directly document this transfer because cash holdings fluctuate tremendously over time, making it impossible to determine whether the high growth firms obtained more funds after the reform.

tax cut because they presumably finance investment out of retained earnings.

6 Substitution with Share Repurchases

As noted in Section 2.1, it is possible for companies to leave total payout unchanged while raising dividends by reducing their share repurchases. If the tax cut simply induced firms to substitute share repurchases by dividends without raising total payout, it would be unlikely that the tax cut had large efficiency benefits because the total amount of capital recirculation would remain unchanged. It is therefore very important to understand the degree to which share repurchases were crowded out by increased dividend payments.

Unfortunately, this exercise is again very difficult because of the volatility of share repurchases over time. Figure 17 illustrates the problem. Panel A depicts the aggregate share repurchases (along with aggregate regular dividend payments) by firms in the core sample which have share repurchase information from compustat from 1984-Q1 to 2004-Q1 (the most recent quarter for which Compustat data are available). The figure shows that share repurchases have exceeded dividend payments since 1997, and that they vary much more from quarter to quarter than dividends. This greater time variability makes it much harder to estimate the effects of the 2003 reform on share repurchases.⁵² The figure shows that share repurchases have increased substantially over the last 3 quarters but, in view of the historical record, it is clearly possible that share repurchases could have increased even more absent the tax change. Hence, it is impossible to draw any reliable conclusions about the effect of the reform on total payout (total dividends + total repurchases) in the aggregate sample.

Panel B of Figure 17 shows that looking at other moments of the total payout distribution in the full sample does not make the statistical inference problem any easier. Panel B displays the total number of firms which repurchase more than 0.1% of their shares (along with the number of firms paying regular dividends) in the core sample. The number of firms repurchasing shares is also very noisy over time, making it impossible to infer the effect of the tax cut on the total number of firms paying out in some form (either dividends or repurchases).

In order to make progress on the substitution question, we must therefore focus on a narrower sample where the noise in repurchases is likely to be small relative to the change in

⁵²Controlling for observable variables or removing the largest share repurchasers does not smooth the time series of share repurchases.

dividend behavior. From Section 5, firms with large executive ownership and large institutional ownership experienced the largest surge in dividend initiations. Panel A of Figure 18 displays the fraction of regular dividend payers and the fraction of firms paying out (either paying regular dividends or repurchasing at least 0.1% of their shares) from 1998-Q1 to 2004-Q1 for the sample of firms in the highest quintile of executive ownership⁵³ and with at least 50% of institutional ownership. Indeed, the figure shows that the fraction paying dividends increased from around 40% before the reform to over 55% by 2004-Q1. Interestingly, the increase in the fraction of firms paying out is quite similar in magnitude, from around 55-60% before the reform to over 75% by 2004-Q1. This graph suggests fairly convincingly that firms with large executive and institutional ownership which were making share repurchases before the reform did not stop those repurchases in order to switch to dividend payments after the reform. Therefore, this graph contradicts the 100% crowding out hypothesis, implying that the reform had real effects on overall payouts. Unfortunately, the series of amounts paid out in the form of repurchases is too noisy to allow us to obtain a more precise estimate of the extent of crowding out in amounts.

Panel B therefore turns to the sample of firms which initiated dividends after the 2003 tax reform. It depicts the amounts of dividends and share repurchases of this subset of firms from 1998-Q1 to 2004-Q1.⁵⁴ Unsurprisingly, the amount of dividends is virtually zero before the reform and increases smoothly to almost \$1 billion by 2004-Q1. The figure also shows that, for this group, the amounts of share repurchases actually increased as well during the last 3 quarters, confirming that firms initiating dividends after the reform are not reducing their share repurchase levels relative to the pre-reform level in order to pay dividends. Furthermore, about 35% of the firms which initiated dividends after the reform never repurchased shares in 2002. In addition, among the firms initiating dividends after the reform, the fraction of firms repurchasing at least 0.1% of their shares fell only from 39% in the 2002 quarters on average to about 35% in 2004-Q1. While the results from Panel B suggest that firms did not simply “relabel” repurchases as dividends after the reform, they do not directly rule out more general forms of substitution, because the selection of this group is endogenous (being based on the choice of initiating dividends). It is conceivable that, absent the reform, the firms that

⁵³These are firms where the top 5 executives own at least 10% of shares.

⁵⁴The figure excludes the largest initiating firm, Microsoft, in order to obtain smoother time series.

initiated dividends would have repurchased more shares instead.

7 Conclusion

Aggregate quarterly dividend payments from publicly traded corporations surged by around \$5 billion or 20% during the six quarters following the reform. Unfortunately, the time series of dividend amounts is too noisy to conclude that this sharp increase was a systematic change associated with the dividend tax cut of 2003 rather than a random event. However, the time series of dividend amounts masks several systematic, detectable changes in dividend behavior following the tax cut. The 2003 tax reform induced a large, widespread set of firms to initiate regular dividend payments or raise the payments they were already making, across all percentiles of the dividend distribution. The sharp rise in regular dividend payments along both intensive and extensive margins is unprecedented in the record of publicly traded U.S. corporations in the last three decades, and offers perhaps the clearest evidence thus far in the literature that tax policy does matter for dividend payments by large corporations. Since the amount of post-reform data that is available is limited, the results of this paper reflect only the short term response to the tax change. However, since dividends are rarely cut and tend to be highly persistent over time, it is highly likely that the positive effect on dividend payments will be persistent.

We documented two important forms of heterogeneity in the dividend response that shed light on the mechanism of the tax response. First, the response was strongest in firms that had the smallest divergence of interests between principals and agents. On the agent side, we find that firms with high executive share ownership and low executive stock-options holding were most likely to initiate dividend payments. On the principal side, firms with large shareholding independent directors and high institutional ownership responded very strongly to the tax cut. Hence, existing “old view” and “new view” models of corporate taxation in the public finance literature appear to miss an important element of the behavioral response to taxation by abstracting from agency problems. Developing a theory of dividend taxation that explicitly incorporates a principal-agent relationship could allow for a more precise assessment of the optimal design of corporate and individual income tax policy.

Second, we provided some suggestive evidence about the efficiency effects of the tax cut

by showing that the surge in dividend payments was not purely a substitution for share repurchases. In addition, firms with high forecasted earnings growth did not change payout policies in response to the tax cut. This suggests that funds may have been channelled away from lower growth firms toward those with better investment opportunities through external capital markets.

The sharp variations induced by the 2003 tax cut offer the opportunity to revisit many other important questions in corporate taxation beyond those addressed in this paper. One issue of particular relevance for distinguishing agency and signalling theories of dividends is the market response to dividend announcements. Bernheim and Wantz (1995) show formally and empirically that if dividends serve a signalling purpose, the market premium for increasing or initiating dividends will be larger when the tax rate is higher. Bernheim and Wantz's empirical findings have been subsequently challenged by Bernhardt et. al. (1994) and Grullon and Michaely (2001), who found using different methods and data that higher tax rates were actually associated with lower dividend announcement premiums. Much of the dispute in this literature stems from the lack of sharp, credible variation in tax rates and dividend behavior. In future work, we plan to examine whether the premium for announcing dividends fell after the 2003 tax cut.

Appendix

• Definition of Initiations and Terminations

We define a firm as initiating dividend payments in quarter t if it pays positive regular dividends in quarter t and did not pay dividends in the previous four quarters ($t-1$, $t-2$, $t-3$, and $t-4$). If the firm pays annual dividends in quarter t (or paid such an annual dividend in quarter $t-5$ or $t-6$), we require in addition that the firm did not pay any dividends in quarters $t-5$ and $t-6$ as well. We impose this condition to accommodate cases where annual dividend payers change the quarter in which they distribute their annual dividend payments, which can create 5 or 6 consecutive quarters with no payments but with no materially relevant interruption in regular dividend payments.

We define a firm as terminating regular dividend payments in quarter t if it pays positive regular dividends in quarter $t-1$ and does not pay dividends in the next four quarters (t , $t+1$, $t+2$, and $t+3$).⁵⁵ Because our data is censored after quarter 2004-Q2, we do not observe the full vector of future dividend payments for observations from 2003-Q2 to 2004-Q2. To describe how we handle these cases, let T denote the last quarter available in the data (2004-Q1). In those cases where $t \geq 2003$ -Q2, we define a firm as terminating regular dividends if one of the following three conditions hold: (1) the firm was a quarterly payer in quarter $t-1$ and paid dividends in all quarters $t-2$, $t-3$, $t-4$, but does not pay in quarters t to T ; (2) the firm was a semi-annual payer in quarter $t-1$, but does not pay for at least two consecutive quarters starting in t ; or (3) the firm was an annual payer in quarter $t-1$, but does not pay for at least four consecutive quarters starting in t . This definition of termination is the closest prediction we can obtain of actual terminations that would be observed if the data were not censored.

• Definition of Intensive Increase and Decrease

We define a firm as increasing its regular dividend payment on the intensive margin by 20% in quarter t if two conditions are met: (1) the firm is *not* initiating payments in quarter t by the definition given above; (2) regular dividends in quarter t exceed regular dividends in quarter $t-1$ *and* quarter $t-4$ by at least 20%.⁵⁶ The definition for decreasing dividends by

⁵⁵In the case of annual payers in quarter $t-1$ (or quarters $t+4$ or $t+5$), we impose in addition that the firm does not pay any dividends in quarters $t+4$ and $t+5$ as well, for the same reason as above.

⁵⁶The requirement that dividends in quarter t exceed dividends in quarter $t-4$ ensures that annual or semi-annual payers are not artificially classified as increasers every time they make a dividend payment.

20% on the intensive margin is analogous. Note that terminations are not counted as decreases to avoid double counting, given their inclusion in the extensive analysis. Every firm is assigned a value of 0 for both the increase and decrease dummy variables in their first four quarters in the sample, since there is inadequate historical information to apply our definition in these cases. Firms not paying or initiating dividends in period t are always assigned a value of 0 for both dummy variables.

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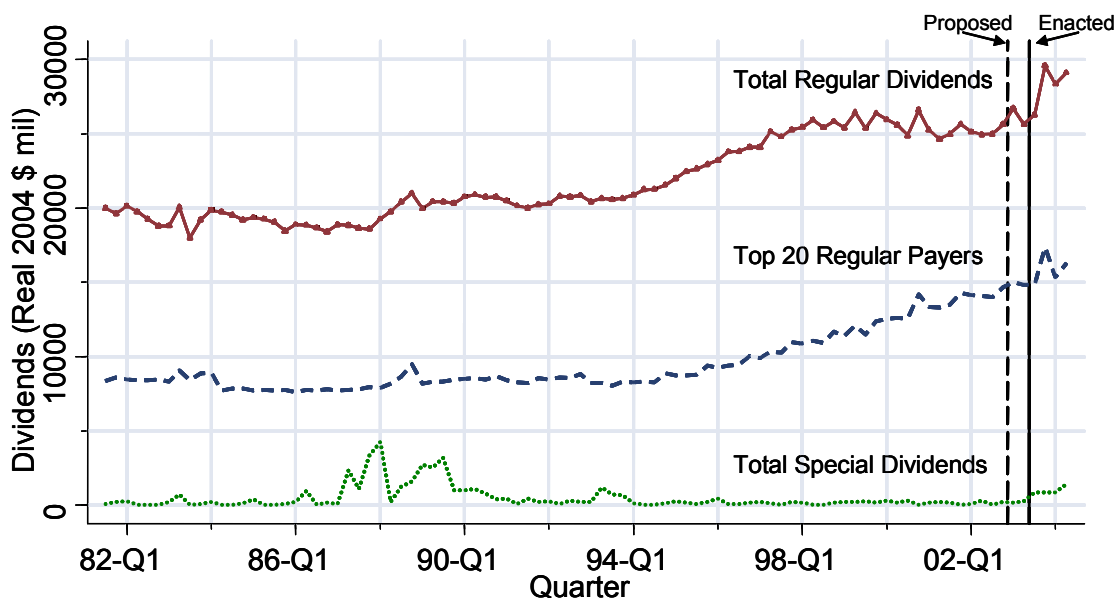
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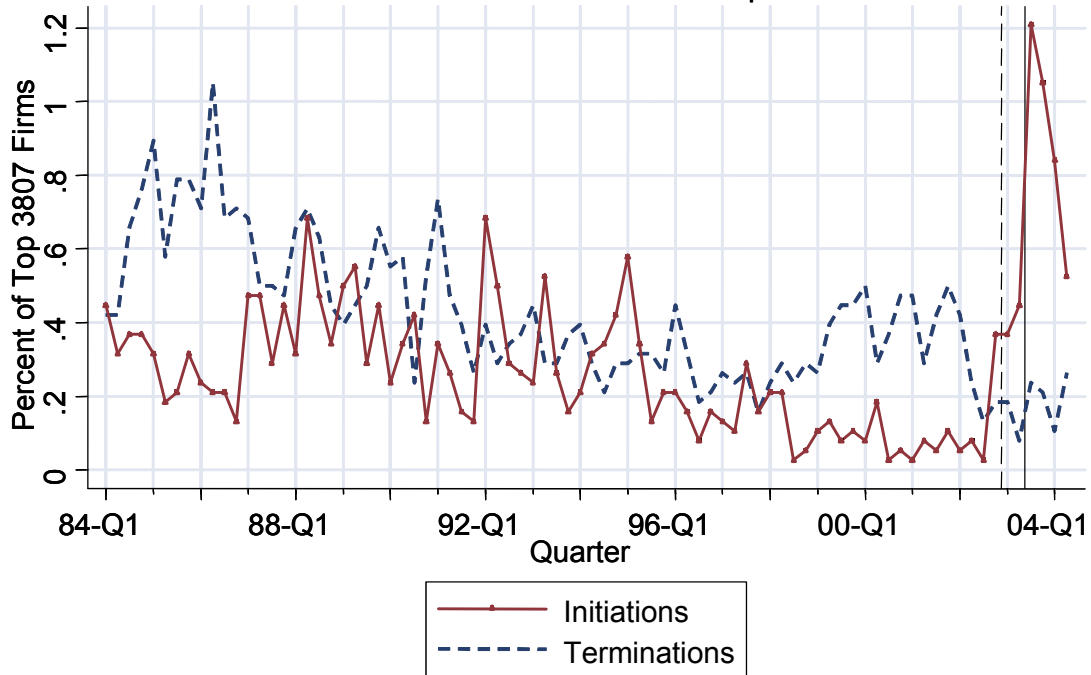
Figure 1
Total Regular and Special Dividends and Top Dividend Payers



This figure depicts the total regular dividend payments, total special dividend payments, and regular dividend payments made by the largest 20 regular dividend payers for each quarter from 1981-Q3 to 2004-Q2. The data sample consists of all firm-quarters in the CRSP database which are non financial, non utility, and non foreign in their last quarter (core sample). Regular dividends are defined as monthly, quarterly, semi-annual, annual taxable dividends. Regular dividends also include other and unknown frequency taxable dividends which are followed by regular payments (see text). Special dividends are defined as special and remaining other and unknown frequency taxable dividends. The solid vertical line (separating quarters 2003-Q2 and 2003-Q3) denotes the time at which the 2003 tax reform was enacted (end of May 2003). The dashed vertical line (separating quarters 2002-Q4 and 2003-Q1) denotes the time at which the lower tax rate on dividend income started (retrospectively) to apply.

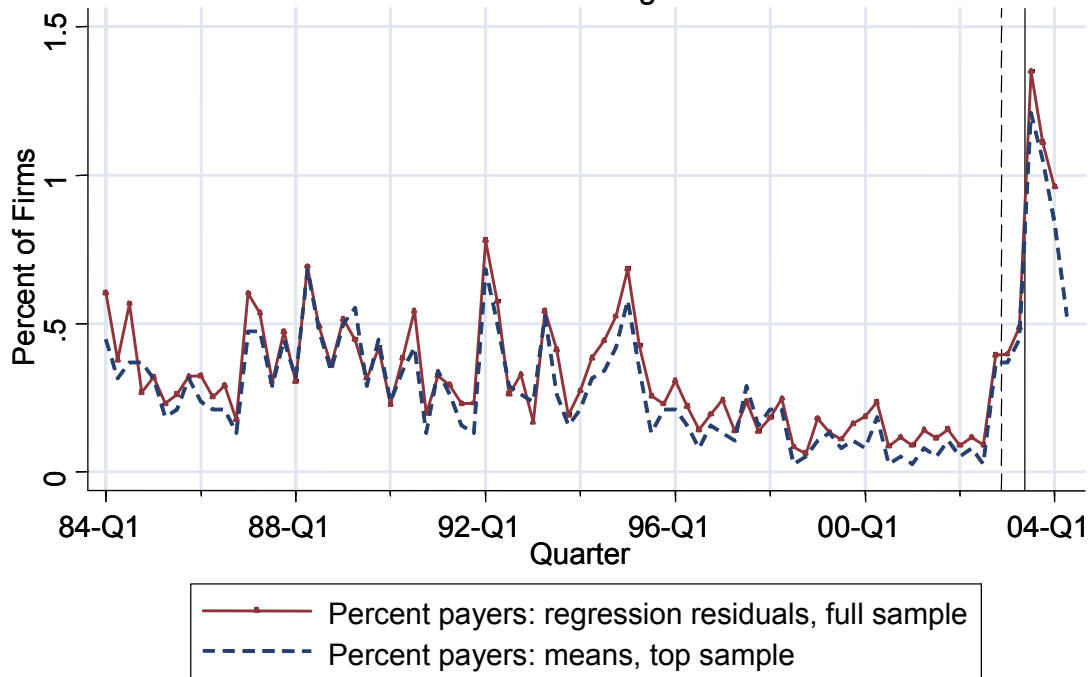
Figure 2

Dividend Initiation and Termination in Top 3807 Firms



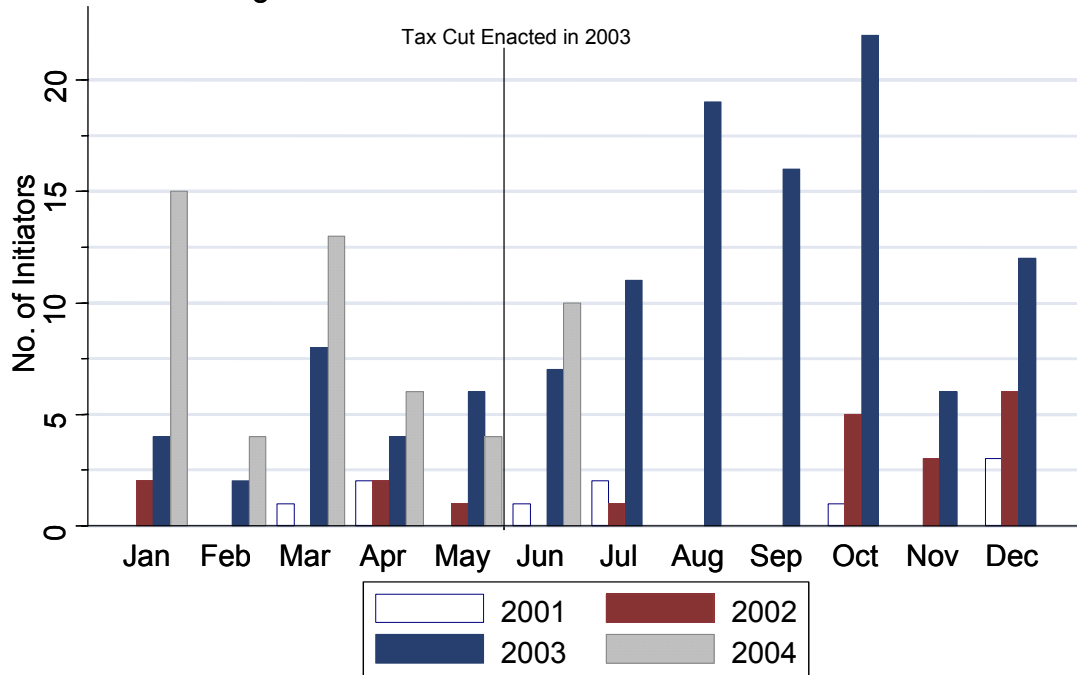
This figure depicts the fraction of firms initiating and terminating regular dividend payments for each quarter from 1984-Q1 to 2004-Q2. The data sample consists, in each quarter, of the top 3,807 firms (ranked by market capitalization in each quarter) in the CRSP database which are non financial, non utility, and non foreign in their last quarter (constant number of firms sample). Initiation is defined as starting to pay regular dividends after having been in the sample and not paying regular dividends for at least four quarter. Termination defined as stopping to pay regular dividend payments. Skipping a dividend payment is not considered a termination (see text for complete details).

Figure 3
Dividend Initiations Controlling for Observables



This figure depicts the fraction of firms initiating dividend payments without and with control variables for each quarter from 1984-Q1 to 2003-Q4. In the case with no controls, the data sample consists as in Figure 2, in each quarter, of the top 3,807 firms (ranked by market capitalization in each quarter) in the CRSP database which are non financial, non utility, and non foreign in their last quarter (constant number of firms sample). The graph reports the straight fraction of those firms initiating dividend payments. In the case with controls, the data sample is same with the additional requirement that variables assets, post-tax profits, cash from Compustat are available. The graph reports the quarter dummy coefficients of an OLS regression of the initiation dummy on a full set of quarter dummies, age of the firm, first digit industry code, assets, post-tax profits, and cash (see text for exact specification).

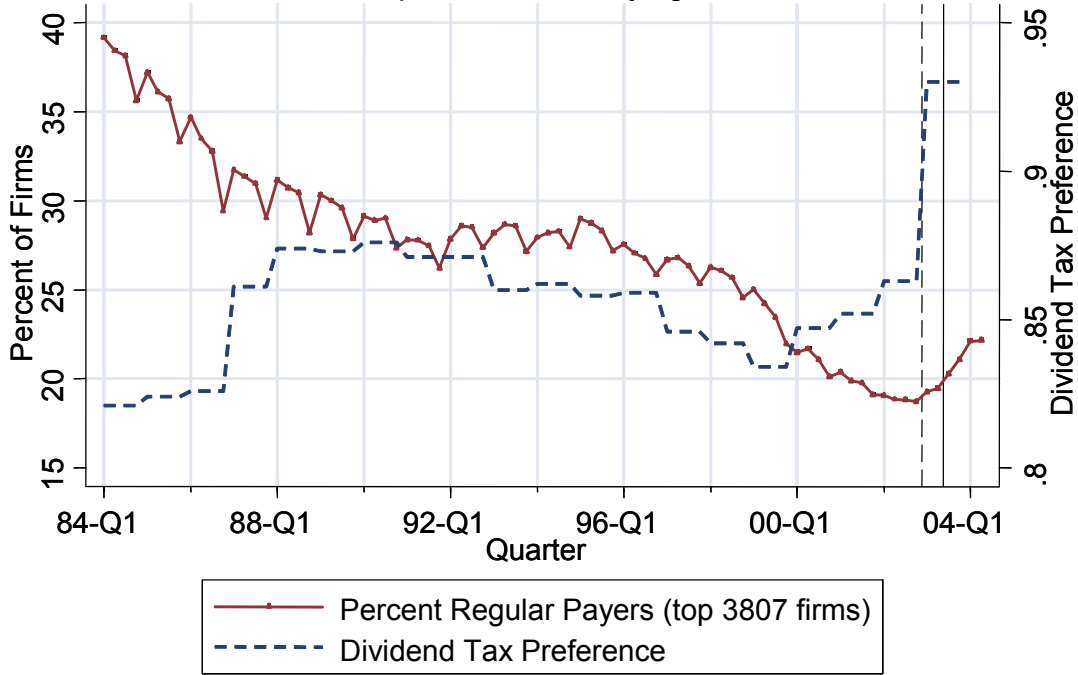
Figure 4
Regular Dividend Initiations Per Month 2001-2004



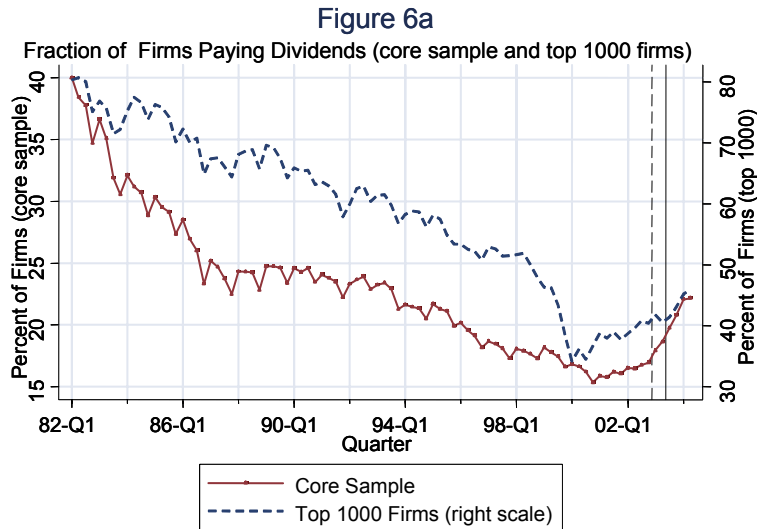
This figure depicts the number of firms initiating dividend payments for each month from January 2001 to June 2004. The data sample consists as in Figure 2, in each month, of the top 3,807 firms (ranked by market capitalization in each corresponding quarter) in the CRSP database which are non financial, non utility, and non foreign in their last quarter (constant number of firms sample). The bar charts reports the straight number of those firms initiating dividend payments. Initiation is defined as starting to pay regular dividends after having been in the sample and not paying regular dividends for at least four quarter (see text for complete details).

Figure 5

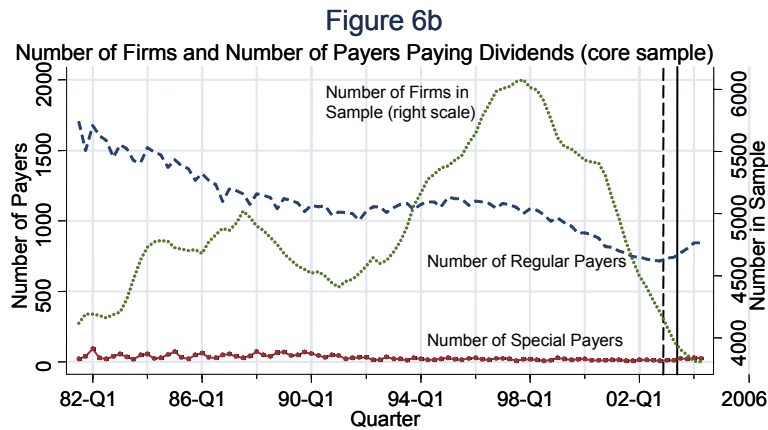
Fraction of Top 3807 Firms Paying Dividends



This figure depicts (with scale on the left vertical axis) the fraction of firms paying regular dividend payments for each quarter from 1984-Q1 to 2004-Q2. The data sample consists, in each quarter, of the top 3,807 firms (ranked by market capitalization in each quarter) in the CRSP database which are non financial, non utility, and non foreign in their last quarter (constant number of firms sample). Regular dividends are defined as monthly, quarterly, semi-annual, annual taxable dividends. Regular dividends also include other and unknown frequency taxable dividends which are followed by regular payments (see text). The figure also depicts (with scale on the right vertical axis) the dividend tax preference parameter from Poterba (2004). This parameter is defined as $(1 - \tau_{div}) / (1 - \tau_{cg})$ where τ_{div} is the average marginal tax rate on dividend income and τ_{cg} the average marginal tax rate on capital gains in the U.S. economy (all sectors).



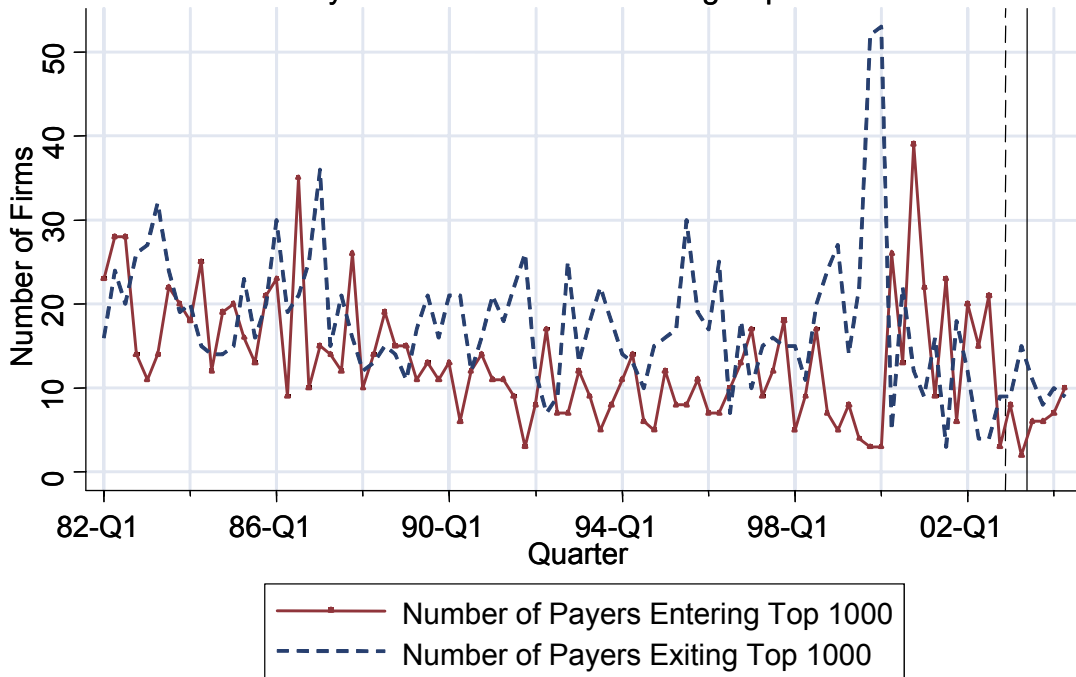
Panel A depicts the fraction of firms paying regular dividend payments for each quarter from 1982-Q1 to 2004-Q2. In the first graph, the data sample consists, in each quarter, of all firms in the CRSP database which are non financial, non utility, and non foreign in their last quarter (core sample). In the second graph, the sample of firms is limited to the top 1,000 firms ranked in each quarter by market capitalization. Regular dividends are defined as monthly, quarterly, semi-annual, annual taxable dividends. Regular dividends also include other and unknown frequency taxable dividends which are followed by regular payments (see text).



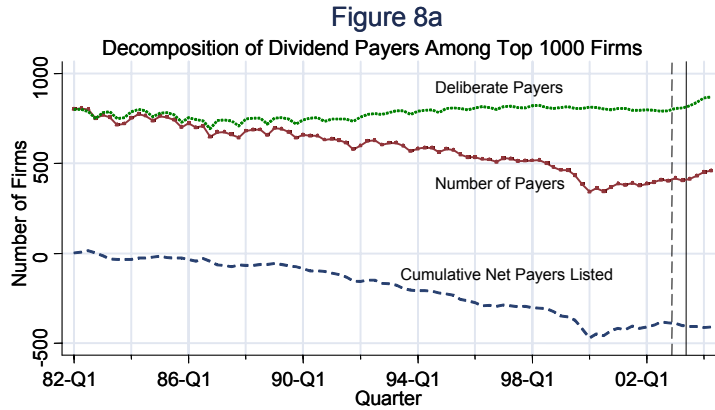
Panel B depicts the total number of firms (with scale on the right vertical axis) and the number of regular dividend payers and special dividend payers (with scale on the left vertical axis) for each quarter from 1982-Q1 to 2004-Q2. For all three graphs, the data sample consists, in each quarter, of all firms in the CRSP database which are non financial, non utility, and non foreign in their last quarter (core sample). Regular dividends are defined as monthly, quarterly, semi-annual, annual taxable dividends. Regular dividends also include other and unknown frequency taxable dividends which are followed by regular payments (see text). Special dividends are defined as special and remaining other and unknown frequency taxable dividends.

Figure 7

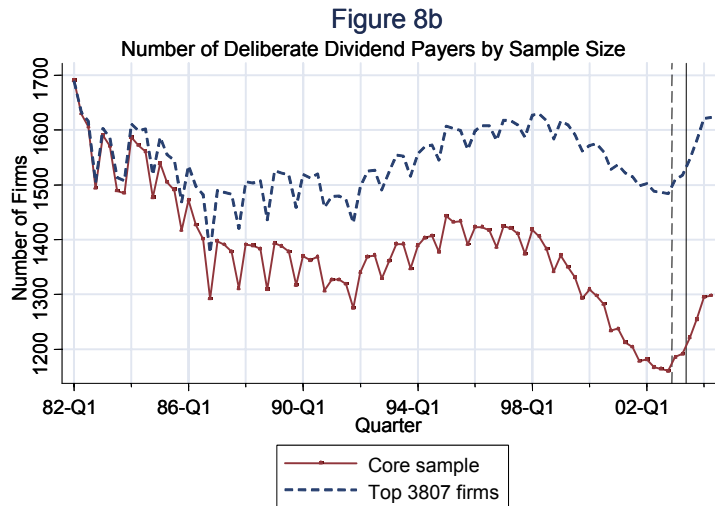
Dividend Payers Turnover Rates Among Top 1000 Firms



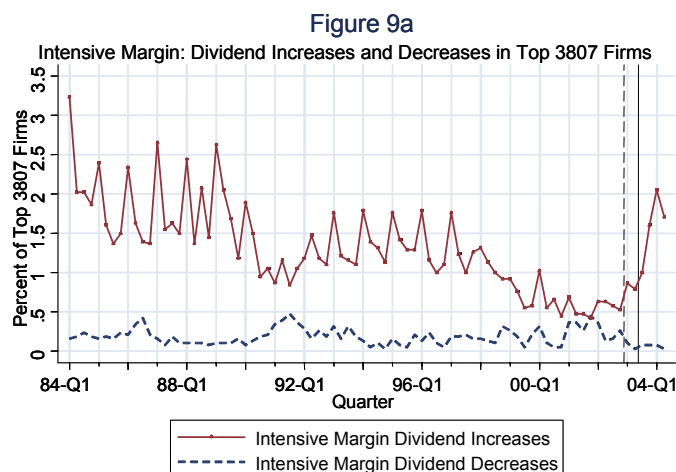
The data sample consists, in each quarter, of the top 1,000 firms (ranked by market capitalization in each quarter) in the CRSP database which are non financial, non utility, and non foreign in their last quarter. The first graph depicts, for each quarter t from 1982-Q1 to 2004-Q2, the number of firms which are regular dividend payers in quarter t and which entered the sample of the top 1,000 firms in quarter t . The second graph depicts, for each quarter from 1982-Q1 to 2004-Q2, the number of firms which were regular dividend payers in quarter $t - 1$ and which leave the sample of the top 1,000 firms in quarter t .



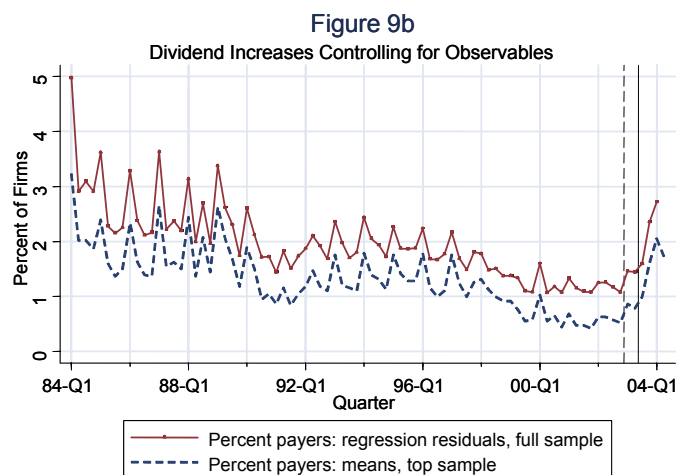
The data sample consists, in each quarter, of the top 1,000 firms (ranked by market capitalization in each quarter) in the CRSP database which are non financial, non utility, and non foreign in their last quarter. The first graph depicts, for each quarter from 1982-Q1 to 2004-Q2, the number of the top 1,000 firms paying regular dividend payments for each quarter from 1982-Q1 to 2004-Q2. The second graph depicts, the cumulative (back from 1982-Q1) difference between the number of regular dividend payers who entered the top 1,000 firms and the number of regular dividend payers who left the top 1,000 firms. This graph is equal to the integral of the difference between the two graphs (payer entering and payers leaving) depicted on Figure 7. The third graph depicts the difference between the first two graphs and captures the number of payers among the top 1,000 firms controlling for entry and exits effects.



The first graph depicts, for each quarter from 1982-Q1 to 2004-Q2, the number of firms paying regular dividend payments net of the cumulative (back from 1982-Q1) net number of dividend payers who entered the sample and the number of regular dividend payers who left the sample. This graph is identical to the third graph in Figure 8, Panel A but the data sample consists, here, in each quarter, of all firms in the CRSP database which are non financial, non utility, and non foreign in their last quarter (core sample), (instead of the top 1,000 firms as in Figure 8, Panel A). The second graph repeats the same exercise but for the constant number of firms sample (the top 3,807 firms, ranked by market capitalization in each quarter). Those two graphs capture the evolution overtime in the number of dividend payers firms controlling for entry and exits effects.

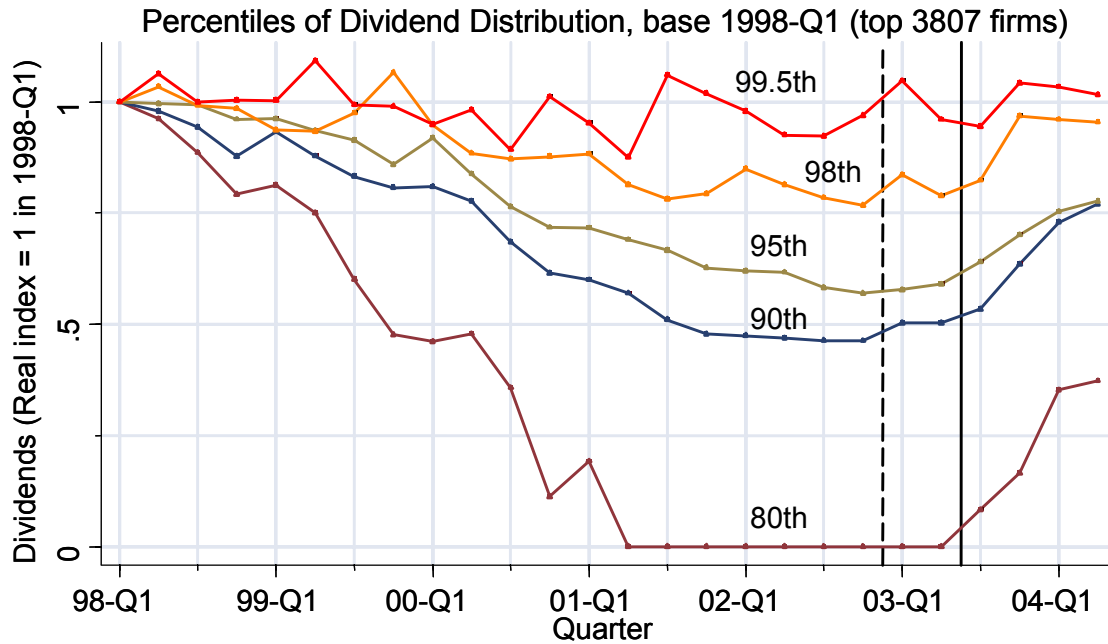


This figure depicts the fraction of firms increasing and decreasing regular dividend payments by more than 20% for each quarter from 1984-Q1 to 2004-Q2. The data sample consists, in each quarter, of the top 3,807 firms (ranked by market capitalization in each quarter) in the CRSP database which are non financial, non utility, and non foreign in their last quarter (constant number of firms sample). An increase in dividend payments by 20% in quarter t occurs when the firm (1) does not initiate dividend payments in quarter t , (2) pays dividends in quarter t larger in real terms by 20% than dividends paid in quarters $t - 1$ and $t - 4$. Decreases in dividends payments are defined in an analogous way. (see text for complete details).



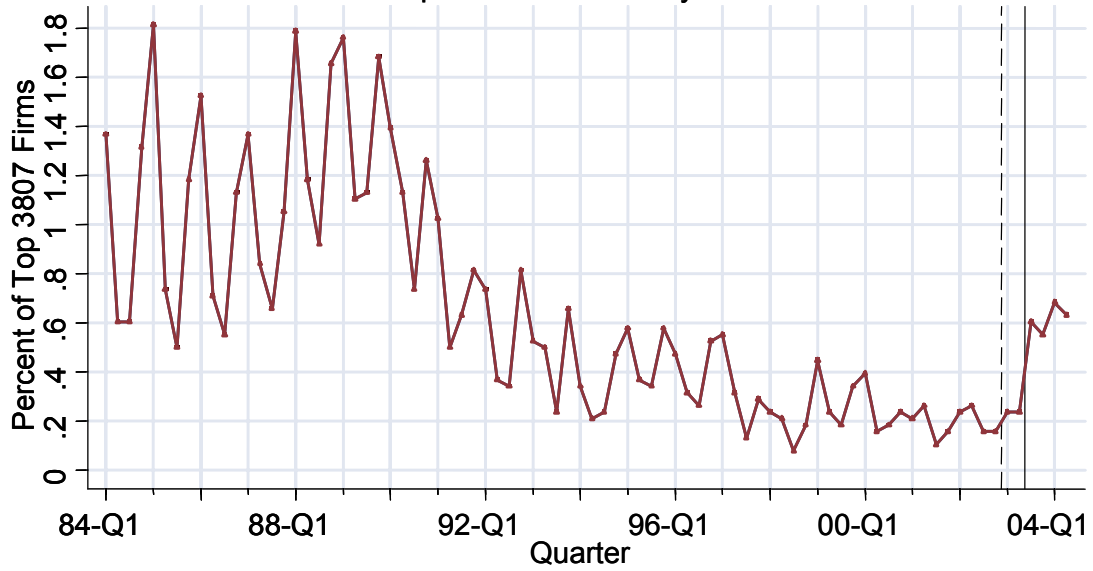
This figure depicts the fraction of firms increasing dividend payments without and with control variables for each quarter from 1984-Q1 to 2003-Q4 . In the case with no controls, the data sample consists as in Figure 2, in each quarter, of the top 3,807 firms (ranked by market capitalization in each quarter) in the CRSP database which are non financial, non utility, and non foreign in their last quarter (constant number of firms sample). The graph reports the straight fraction of those firms initiating dividend payments. In the case with controls, the data sample is same with the additional requirement that variables assets, post-tax profits, cash from Compustat are available. The graph reports the quarter dummy coefficients of an OLS regression of the initiation dummy on a full set of quarter dummies, age of the firm, first digit industry code, assets, post-tax profits, and cash.

Figure 10



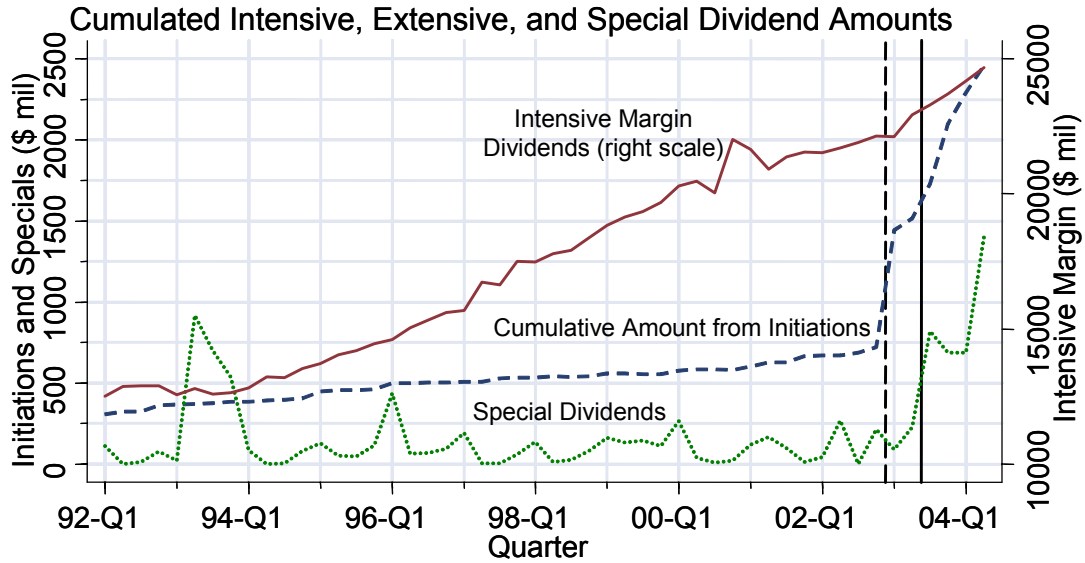
The data sample consists, in each quarter, of the top 3,807 firms (ranked by market capitalization in each quarter) in the CRSP database which are non financial, non utility, and non foreign in their last quarter (constant number of firms sample). The figure depicts various percentiles of the regular dividend distribution at each quarter from 1998-Q1 to 2004-Q2. The zeros (non dividend payers) are included in the distribution. The percentiles are normalized so that they are all equal to one in 1998-Q1.

Figure 11
Special Dividend Payers



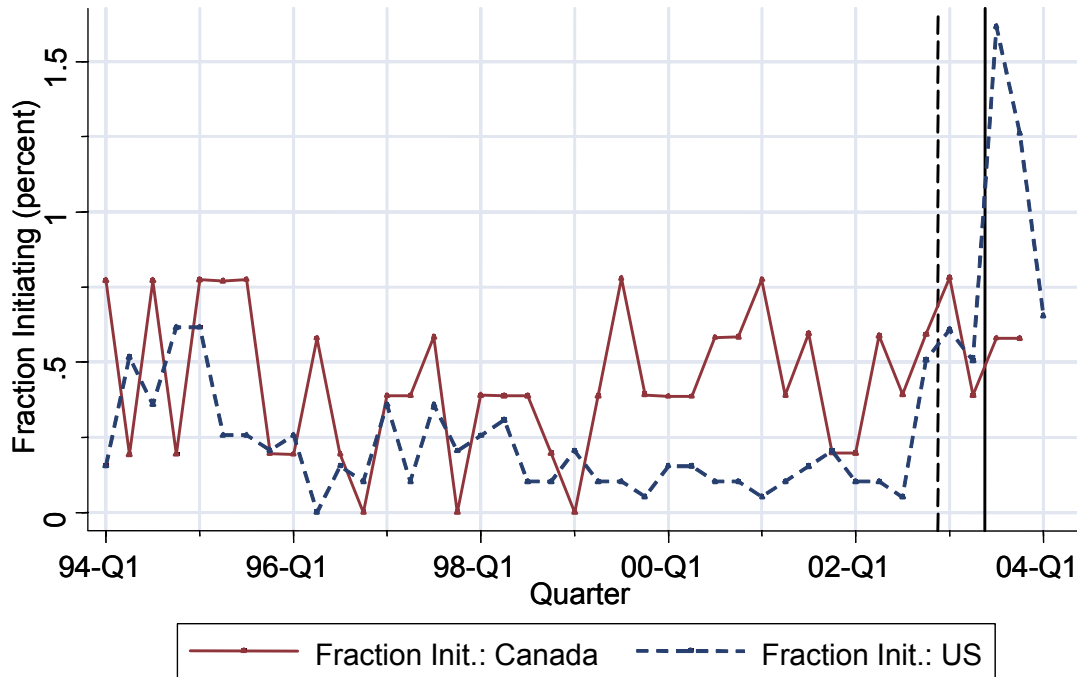
The data sample consists, in each quarter, of the top 3,807 firms (ranked by market capitalization in each quarter) in the CRSP database which are non financial, non utility, and non foreign in their last quarter (constant number of firms sample). The figure depicts, for each quarter from 1984-Q1 to 2004-Q2, the fraction of firms making special dividends payments.

Figure 12

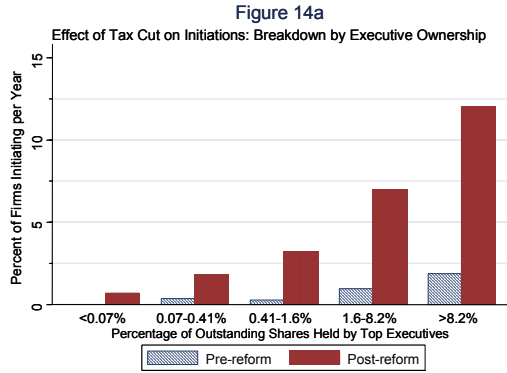


The data sample consists, in each quarter from 1992-Q1 to 2004-Q2, of all the firms in the CRSP database which are non financial, non utility, and non foreign in their last quarter and that are in the CRSP database in the last quarter 2004-Q2. The first graph (cumulated amounts from initiations, left vertical scale) depicts, for each quarter t , the cumulated amount of dividend payments made by firms initiating dividends at or before quarter t . The amounts are expressed in real 2004-Q1 dollars. For each firm, the amount is frozen at the level at which the firm initiated dividends. This graph therefore captures the changes in dividend payments along the initiation margin only. The second graph (Special Dividends, left vertical scale) depicts the total amount of special dividends paid in each quarter. The third graph (Intensive Margin Dividends, right vertical scale) depicts, for each quarter t , the cumulated amount of dividend increases (or decreases) made by firms already paying dividends. The amounts are expressed in real 2004-Q1 dollars. This graph captures changes in dividend payments along the intensive margin.

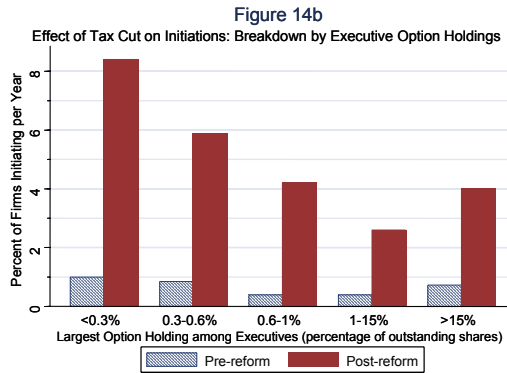
Figure 13
Fraction of Initiations in Canada and the United States



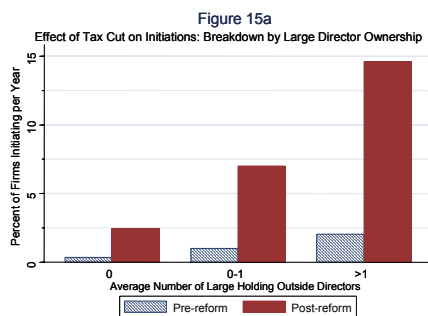
This figure depicts the fraction of firms initiating dividend payments for each quarter from 1994-Q1 to 2004-Q2 in Canada (first graph) and in the United States (second graph). For Canada, the data sample consists of Compustat Canada firms which are non financial, non utility, and incorporated in Canada in the last quarter and which remain in the sample from 1994-Q1 and 2004-Q2. For the United States, the data sample consists of CRSP firms which are non financial, non utility, and non foreign in the last quarter and which remain in the sample from 1994-Q1 and 2004-Q2. Initiation of dividends are defined as above.



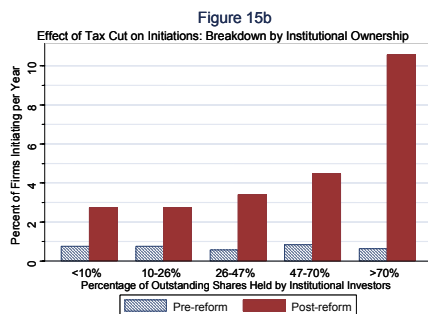
This figure depicts the percentage of firms initiating dividends at an annualized rate pre-reform (from 1998-Q1 to 2002-Q4) and post-reform (from 2003-Q1 to 2004-Q2) by quintiles of executive ownership. The data sample consists of all firms present in CRSP in each quarter from 1998-Q1 to 2004-Q2. All firms-quarters (i, t) for which firm i paid regular dividends in any of the previous four quarters ($t-1, t-2, t-3, t-4$) are discarded from the sample (so as to focus only on firms not paying dividends previously). Executive ownership is defined by the share of the company owned by the executive (among the top five best paid executives in the firm) with the largest share ownership. For firms not initiating dividends over the period 1998-Q1 to 2004-Q2, the share of executive ownership is computed as the average over the period. For firms initiating dividends, the share of executive ownership is computed as off when the firm initiates dividends (and this number applied to all quarters). Therefore, the groups are fixed overtime. Executive share ownership is obtained from Execucomp data and directly collected from the Lexis/Nexis electronic database of proxy statements for all firms initiating dividends from 1998-Q1 to 2004-Q2 and a 10% random sample of the remaining firms not initiating and not in the Execucomp database. The horizontal axis depicts, for each quintile, the percentage range of shares owned by the largest executive owner.



This figure depicts the percentage of firms initiating dividends at an annualized rate pre-reform (from 1998-Q1 to 2002-Q4) and post-reform (from 2003-Q1 to 2004-Q2) by quintiles of executive option holding. The data sample is the same as in Panel A. Executive option holding is defined by the fraction of shares of the company owned by the executive (among the top five best paid executives in the firm) in the form of unexercisable stock-options (stock-options which has been granted but are not yet vested and hence cannot yet be exercised) with largest such option holdings. Quintiles are defined in an analogous way as in Panel A. Executive option holdings is obtained from Execucomp data and directly collected from the Lexis/Nexis electronic database of proxy statements for all firms initiating dividends from 1998-Q1 to 2004-Q2 and a 10% random sample of the remaining firms not initiating and not in the Execucomp database. The horizontal axis depicts, for each quintile, the percentage range of option holdings (as a percentage of total shares outstanding) owned by the largest executive owner.



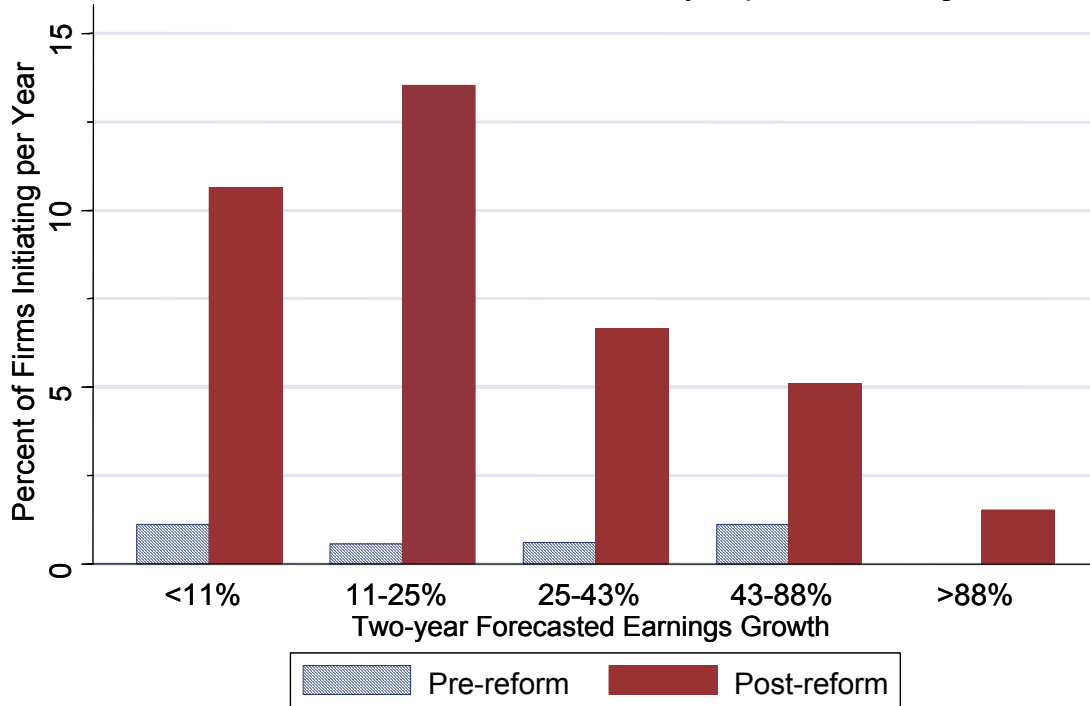
This figure depicts the percentage of firms initiating dividends at an annualized rate pre-reform (from 1998-Q1 to 2002-Q4) and post-reform (from 2003-Q1 to 2004-Q2) by the number of large independent directors shareholders. The data sample consists of all firms present in CRSP in each quarter from 1998-Q1 to 2004-Q2. All firms-quarters (i,t) for which firm i paid regular dividends in any of the previous four quarters ($t-1,t-2,t-3,t-4$) are discarded from the sample (so as to focus only on firms not paying dividends previously). Large independent directors shareholders is defined as the number of individuals on the board of directors who are large shareholders (owning at least 5% of the company) and who are not insiders (i.e., who are not executive employees in the company). The three groups of firms are defined as (1) those having no such large independent director shareholder over the period, (2) those having between 0 and up to 1 such directors, (3) those with more than 1 such director. For firms not initiating dividends over the period 1998-Q1 to 2004-Q2, the number of directors is computed as the average over the period. For firms initiating dividends, the number of directors is computed as off when the firm initiates dividends (and this number applied to all quarters). Therefore, the groups are fixed overtime. Data on large independent director shareholders is obtained from the Dlugosz, Fahlenbrach, Gompers, and Metrick (2004) database and directly collected from the Lexis/Nexis electronic database of proxy statements for all firms initiating dividends from 1998-Q1 to 2004-Q2 and a 10% random sample of the remaining firms not initiating and not in the Dlugosz, Fahlenbrach, Gompers, and Metrick (2004) database.



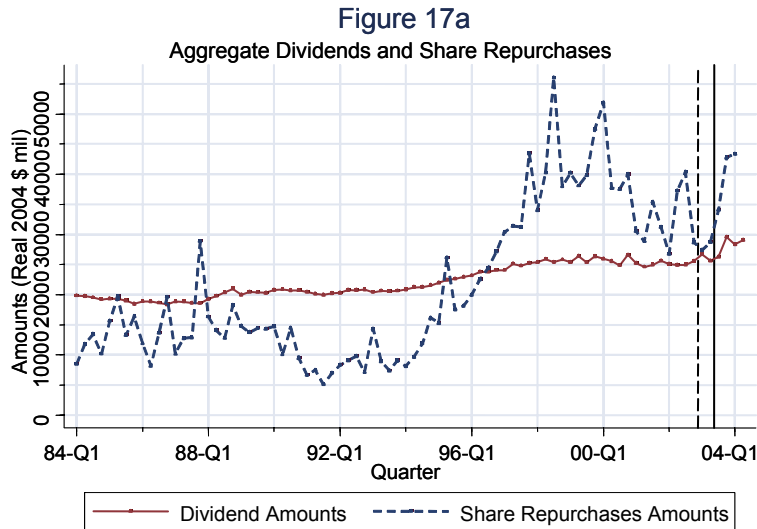
This figure depicts the percentage of firms initiating dividends at an annualized rate pre-reform (from 1998-Q1 to 2002-Q4) and post-reform (from 2003-Q1 to 2004-Q2) by quintiles of institutional share ownership. The data sample is the same as in Panel A. Institutional share ownership is defined as the fraction of the firm owned by institutions such as other corporations, non-profit organizations, government, all forms of investment funds, etc. Institutional ownership data is obtained from the Thomson financial database. For firms not initiating dividends over the period 1998-Q1 to 2004-Q2, the share of institutional ownership is computed as the average over the period. For firms initiating dividends, the share of institutional ownership is computed as off when the firm initiates dividends (and this number applied to all quarters). Therefore, the groups are fixed overtime. The horizontal axis depicts, for each quintile, the percentage range of institutional share ownership (as a percentage of total shares outstanding).

Figure 16

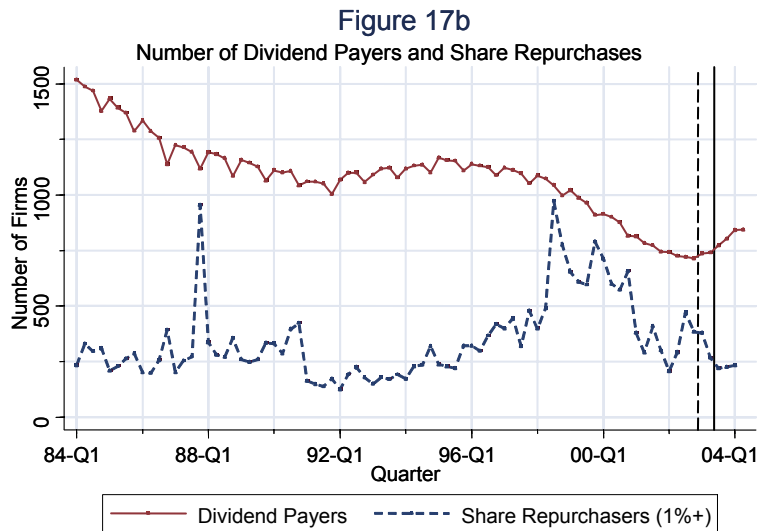
Effect of Tax Cut on Initiations: Breakdown by Expected Earnings Growth



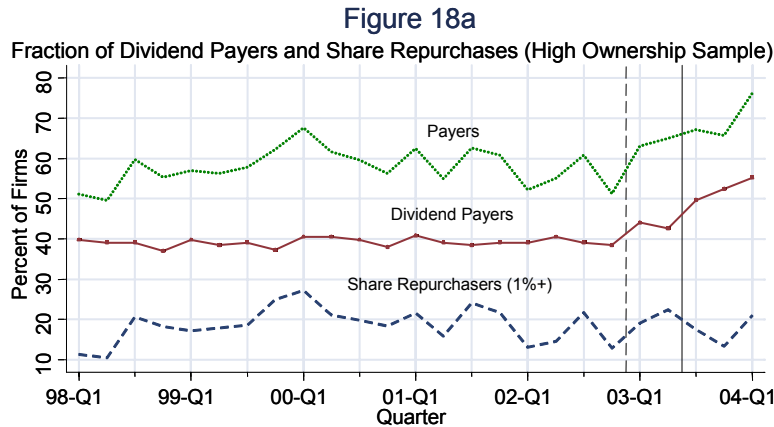
This figure depicts the percentage of firms initiating dividends at an annualized rate pre-reform (from 1998-Q1 to 2002-Q4) and post-reform (from 2003-Q1 to 2004-Q2) by quintiles of expected earnings growth. The data sample consists of all firms present in CRSP in each quarter from 1998-Q1 to 2004-Q2. All firms-quarters (i,t) for which firm i paid regular dividends in any of the previous four quarters $(t-1,t-2,t-3,t-4)$ are discarded from the sample (so as to focus only on firms not paying dividends previously). Expected earnings growth is defined using I/B/E/S data on analysts' earnings forecasts as follows. We first compute the expected change in earnings per share as the mean earnings per share forecast for a two year forecast period minus the actual earnings per share in the current year. We then multiply this figure by the total number of shares outstanding and divide by total assets to arrive at a normalized measure of earnings growth per dollar of assets. The five quintiles of earnings growth are defined over the sample of firm-quarter pairs (therefore, the quintiles are not constant overtime). The horizontal axis depicts, for each quintile, the percentage range of earnings growth forecast.



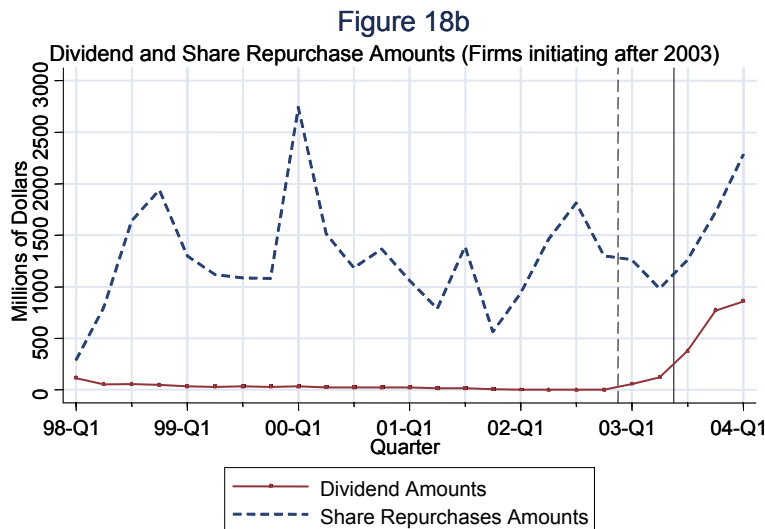
This figure depicts the total regular dividend payments and total share repurchases from 1984-Q1 to 2004-Q2 (expressed in real 2004-Q1 millions of dollars). For regular dividends, the data sample consists of all firm-quarters in the CRSP database which are non financial, non utility, and non foreign in their last quarter (core sample). Regular dividends are computed and defined as monthly, quarterly, semi-annual, annual taxable dividends. Regular dividends also include other and unknown frequency taxable dividends which are followed by regular payments (see text). For share repurchases, the data sample is same as above but with the additional requirement that the firm appears in the quarterly compustat database and that the compustat variable share repurchase (item data93L Purchases of common and preferred stock) exists.



This figure depicts the total number of regular dividend payments and total number of firms repurchasing at least 0.1% of their shares from 1984-Q1 to 2004-Q2. For regular dividends payers, the data sample consists of all firm-quarters in the CRSP database which are non financial, non utility, and non foreign in their last quarter (core sample). For share repurchases, the data sample is same as above but with the additional requirement that the firm appears in the quarterly compustat database and that the compustat variable share repurchase (item data93: Purchases of common and preferred stock) exists.



This figure depicts the fraction of regular dividend payers and the fractions of firms repurchasing at least 0.1% of their shares for each quarter from 1998-Q1 to 2004-Q1. The sample consists of all non financial, non utility firms, non foreign firms present in the CRSP and COMPUSTAT database in all quarters from 1998-Q1 to 2004-Q1 meeting the following additional criteria. The firms are in the top quintile of executive share ownership (about 10% or more held by top 5 executives), and have at least 50% of institutional ownership. The data on executive and institutional ownership is from execucomp and, for firms not in the execucomp database, collected directly from proxy statements for all firms initiating dividends from 1998-Q1 to 2004-Q1 and a random 10% sample of firms not initiating dividends (see text for details). The data on institutional ownership is from Thomson financial.



This figure depicts the amount of regular dividend paid and the amount of share repurchases for each quarter from 1998-Q1 to 2004-Q1. The sample consists of all non financial, non utility firms, non foreign firms present in the CRSP who initiate regular dividend payments after the 2003 reform (from 2003-Q1 to 2004-Q2) and which have COMPUSTAT information on share repurchases (data item 93 in quarterly COMPUSTAT database). Microsoft is excluded from the sample in order to obtain much smoother series.

Table 1
Summary Statistics

Variables	Core Sample (All Firms in CRSP)		Constant Number of Firms Sample (Top 3,807 firms)	
	Mean	St. Dev.	Mean	St. Dev.
Average Regular Dividends	4.52	40.44	5.81	45.78
Average Special Dividends	0.10	10.36	0.13	11.74
Average Share Repurchase	5.32	64.72	6.88	73.52
Fraction paying regular dividends	22.68%	41.88%	28.34%	45.07%
Fraction paying special dividends	0.59%	7.63%	0.67%	8.17%
Fraction Initiations	0.24%	4.91%	0.29%	5.38%
Fraction Terminations	0.46%	6.77%	0.46%	6.79%
Fraction Increases (20%+)	1.15%	10.65%	1.43%	11.88%
Fraction Decreases (20%+)	0.17%	4.17%	0.21%	4.62%
Fraction Repurchasing (0.1%+)	15.09%	35.80%	16.72%	37.32%
Average Market Capitalization	1125.82	8285.92	1444.76	9373.65
Assets	1148.76	8176.02	1456.16	9212.09
Cash and liquid assets	80.01	568.36	101.15	640.29
After-Tax Profits	9.89	161.13	12.91	181.11
# firm-quarter observations	<u>CRSP</u> 440,772	<u>CRSP-COMP</u> 396,026	<u>CRSP</u> 342,630	<u>CRSP-COMP</u> 310,328

NOTE-Core sample includes all firm-quarters in CRSP that are non utility, non financial and non foreign in their last quarter from 1982-Q1 to 2004-Q2. Constant number of firms sample keeps only the top 3,807 firms ranked by market capitalization. All dollar amounts are in real 2004-Q1 millions of dollars. All variables are from CRSP sample except assets, cash, share repurchases, and profits, which are from COMPUSTAT.

Table 2**Post Reform Initiations among Top 100 Largest Companies**

(1)	(2)	(3)	(4)	(5)	(6)
Company Name	Industry	Market Capitalization Rank in 2004-Q2	Market Cap. when initiating (\$Millions)	Dividends in first year (\$Millions)	Annual Dividend Yield
1. Microsoft	Software	2	260,047	2610	1.00%
2. Viacom	Entertainment	28	67,162	392	0.58%
3. Qualcomm	Wireless Equipment	31	28,962	192	0.66%
4. Clear Channel Com.	Radio, Television	73	26,769	244	0.91%
5. Guidant	Medical Equipment	94	13,144	112	0.85%
6. Costco Wholesale	Discount Stores	96	17,728	182	1.03%
7. Analog Devices	Semiconductors	98	17,315	74	0.43%
8. Best Buy	Electronic Stores	100	18,764	196	1.04%
All dividend payers among top 100 companies					1.98%

NOTE-The table lists all the companies among the top 100 (ranked by market capitalization in 2004-Q2) in the CRSP non financial, non utility, non foreign data which have initiated regular dividend payments from 2003-Q1 to 2004-Q2.

Annual dividend yield and annual dividends based on payments made during first four quarters after initiation. (payments are extrapolated based on current payments if less than 4 quarters of data are available after initiation). Average yield among top 100 companies is not weighted by market capitalization.

Table 3
Summary of Results

	Pre-reform (02-Q1 - 02-Q4)	Post-reform (03-Q3 - 04-Q2)	Change
# Regular dividend Initiations per quarter	5 (6.06)	34.5 (11.24)	29.5 (6.38)
# Regular dividend increases (>20%)	22.5 (1.91)	60.5 (16.66)	38 (8.39)
# Special dividend payers	7.75 (2.06)	23.5 (2.08)	15.75 (1.46)
Cumulated dividends, extensive margin	687.6 (23.98)	2144.3 (313.61)	1456.7 (157.26)
Cumulated dividends, intensive margin	21810.7 (266.53)	23968.8 (597.74)	2158 (327.24)
Special dividends amounts per quarter	131.9 (128.81)	879.1 (340.44)	765.2 (182.00)
Total dividend amounts per quarter	24751.2 (420.22)	28317.1 (1457.7)	3565.8 (758.51)

This table reports the average value pre-reform (4 quarters of 2002) and post-reform (4 quarters from 2003-Q3 to 2004-Q2), as well as the difference post-pre reform for a number of variables of interest. Standard errors are reported in parenthesis below the estimates. The number of regular dividend initiations is defined as firms starting to pay regular dividends after not having paid for 4 quarters (6 quarters if annual payer).

The number of regular dividend increases is defined as those firms increasing regular dividend payments by at least 20% in real terms in quarter t (relative to quarters t-1 and t-4). Dividend initiations are not counted as intensive increases or decreases.

Table 4a
Interaction of Executive Incentives
Post-Reform Annual Initiation Rate by Share and Option Holding Groups

		Percentage of Shares Held by Top Executives		
		< 0.3%	0.3-2.8%	> 2.8%
Largest Option Holding among Executives	< 0.4%	2.75	4.53	14.00
	0.4-1.0%	1.43	4.35	10.47
	> 1.0%	0.67	1.90	7.03

Table 4b
Interaction between Agents and Principals
Post-Reform Annual Initiation Rate by Exec Shares/Options and Institution Groups

		Percentage of Shares Held by Institutional Investors		
		< 35%	35-63%	> 63%
Ratio of largest exec. shareholding to largest exec option holding	<0.7	0.24	0.60	4.16
	0.7-4.3	3.68	1.20	9.00
	>4.3	7.04	7.80	14.72

The tables report the annual dividend initiation rate after the reform (from 2003-Q3 to 2004-Q2) for firms alive from 1998-Q1 to 2004-Q2 in various groups. Groups are defined by size of option holdings and executive ownership Panel a and ratio of share ownership to options and institutional ownership in Panel b.

Table A1
Aggregate Time Series for Core Sample

(1)	(2)	(3)	(4)	(5)	(6)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Quarter	Poterba (2004) tax pref.	CPI	Regular dividends (\$ mn)	Special dividends (\$ mn)	Share repurchases (\$ mn)	Market Capitalization (\$ bn)	# firms	# regular dividend payers	# special payers	# initiations	# terminations	# intensive increase (20%+)	# intensive decrease (20%+)	# share repurchas es (0.1%+)	# entrants paying dividends	# leavers who paid dividends	cumulative net change in payers	# deliberate dividend payers
1981-Q3	0.748	0.535	19,980	63		1,849	4,117	1,703	22	5		108	9					1,703
1981-Q4	0.748	0.543	19,601	217		1,804	4,191	1,499	39	5	38	71	10		0	7	-7	1,506
1982-Q1	0.800	0.550	20,131	265		1,638	4,190	1,676	91	20	43	216	11		2	10	-15	1,691
1982-Q2	0.800	0.556	19,748	20		1,579	4,177	1,605	26	9	46	47	18		0	10	-25	1,630
1982-Q3	0.800	0.564	19,243	11		1,577	4,158	1,570	19	6	43	45	30		0	11	-36	1,606
1982-Q4	0.800	0.571	18,766	34		1,900	4,185	1,452	36	4	40	58	36		3	9	-42	1,494
1983-Q1	0.811	0.576	18,793	190		2,096	4,206	1,540	56	16	37	87	39		0	8	-50	1,590
1983-Q2	0.811	0.581	20,040	722		2,365	4,311	1,513	34	5	21	148	17		2	10	-58	1,571
1983-Q3	0.811	0.588	17,974	12		2,357	4,470	1,426	16	16	36	87	8		0	5	-63	1,489
1983-Q4	0.811	0.592	19,189	82		2,338	4,629	1,415	48	13	21	100	7		2	9	-70	1,485
1984-Q1	0.821	0.599	19,853	207	8,435	2,245	4,728	1,518	55	18	21	126	6	331	3	2	-69	1,587
1984-Q2	0.821	0.605	19,734	22	11,761	2,104	4,770	1,488	25	13	21	77	7	464	0	15	-84	1,572
1984-Q3	0.821	0.609	19,520	10	13,405	2,138	4,783	1,469	26	17	35	77	9	478	3	11	-92	1,561
1984-Q4	0.821	0.613	19,200	96	10,204	2,127	4,775	1,378	52	14	39	78	7	545	1	8	-99	1,477
1985-Q1	0.824	0.620	19,351	382	15,627	2,285	4,725	1,433	73	12	39	91	6	402	0	7	-106	1,539
1985-Q2	0.824	0.624	19,265	21	19,640	2,316	4,712	1,392	30	8	29	61	7	393	1	8	-113	1,505
1985-Q3	0.824	0.628	19,035	14	13,237	2,294	4,702	1,370	21	8	30	52	7	427	4	12	-121	1,491
1985-Q4	0.824	0.633	18,446	68	16,350	2,400	4,709	1,288	48	12	34	57	9	483	0	8	-129	1,417
1986-Q1	0.826	0.638	18,883	182	11,878	2,637	4,677	1,334	61	9	36	90	8	367	1	10	-138	1,472
1986-Q2	0.826	0.638	18,847	943	8,174	2,887	4,771	1,287	30	8	49	63	13	365	4	6	-140	1,427
1986-Q3	0.826	0.643	18,653	29	13,635	2,753	4,828	1,257	26	8	34	53	16	440	1	5	-144	1,401
1986-Q4	0.826	0.648	18,393	154	19,598	2,774	4,879	1,138	47	5	34	52	8	607	1	11	-154	1,292
1987-Q1	0.861	0.655	18,871	72	10,146	3,200	4,863	1,225	56	19	36	103	7	419	2	20	-172	1,397
1987-Q2	0.861	0.661	18,830	2,354	12,734	3,334	4,917	1,214	37	19	24	59	3	432	3	8	-177	1,391
1987-Q3	0.861	0.667	18,627	1,070	12,857	3,610	5,021	1,193	28	12	25	62	7	493	1	9	-185	1,378
1987-Q4	0.861	0.673	18,573	3,339	28,852	2,601	4,969	1,118	41	18	26	59	4	1,143	0	8	-193	1,311
1988-Q1	0.874	0.679	19,254	4,261	16,329	2,786	4,898	1,192	73	12	27	93	4	628	1	7	-199	1,391
1988-Q2	0.874	0.686	19,765	207	14,044	2,818	4,863	1,183	48	26	33	55	4	515	0	7	-206	1,389
1988-Q3	0.874	0.694	20,389	1,218	12,764	2,762	4,806	1,165	38	18	28	79	4	478	1	13	-218	1,383
1988-Q4	0.874	0.701	20,983	1,599	18,207	2,752	4,752	1,085	66	14	25	55	3	606	3	9	-224	1,309
1989-Q1	0.873	0.710	19,958	2,715	14,761	2,832	4,677	1,157	70	19	20	101	4	504	0	12	-236	1,393
1989-Q2	0.873	0.719	20,431	2,535	13,726	3,003	4,625	1,145	46	21	19	78	4	447	0	7	-243	1,388
1989-Q3	0.873	0.723	20,396	3,174	14,423	3,224	4,576	1,128	48	11	25	64	5	417	2	9	-250	1,378
1989-Q4	0.873	0.729	20,313	991	14,314	3,145	4,549	1,064	67	17	29	45	6	552	0	3	-253	1,317
1990-Q1	0.876	0.740	20,753	971	14,710	2,966	4,519	1,111	57	9	26	72	3	551	1	7	-259	1,370
1990-Q2	0.876	0.748	20,886	1,103	10,048	3,114	4,531	1,101	45	13	23	57	5	502	2	4	-261	1,362
1990-Q3	0.876	0.758	20,712	746	14,454	2,854	4,498	1,107	31	16	10	36	7	642	1	2	-262	1,369
1990-Q4	0.876	0.767	20,732	370	9,457	2,691	4,442	1,043	49	5	22	40	8	701	3	5	-264	1,307
1991-Q1	0.871	0.773	20,469	416	6,614	3,096	4,408	1,061	43	13	29	33	14	378	1	3	-266	1,327
1991-Q2	0.871	0.777	20,151	66	7,478	3,256	4,455	1,060	20	10	19	45	15	307	0	1	-267	1,327
1991-Q3	0.871	0.783	19,993	417	5,100	3,372	4,471	1,051	27	7	18	32	18	323	1	2	-268	1,319
1991-Q4	0.871	0.789	20,205	198	6,940	3,444	4,515	1,004	31	6	11	40	14	389	0	3	-271	1,275
1992-Q1	0.871	0.795	20,281	242	8,302	3,650	4,579	1,068	31	26	16	45	11	325	1	2	-272	1,340
1992-Q2	0.871	0.800	20,766	42	9,032	3,602	4,643	1,099	15	19	12	56	6	386	2	0	-270	1,369
1992-Q3	0.871	0.806	20,739	315	9,781	3,601	4,599	1,100	14	12	13	47	10	431	1	2	-271	1,371
1992-Q4	0.871	0.811	20,847	190	7,082	3,744	4,620	1,058	33	10	21	42	9	452	0	0	-271	1,329
1993-Q1	0.860	0.815	20,410	179	14,313	3,859	4,692	1,091	22	9	17	67	13	361	1	0	-270	1,361
1993-Q2	0.860	0.820	20,643	1,171	8,869	3,889	4,775	1,118	21	20	14	48	6	400	0	4	-274	1,392
1993-Q3	0.860	0.823	20,568	702	7,388	4,007	4,890	1,122	10	14	15	47	12	406	5	1	-270	1,392

1993-Q4	0.860	0.828	20,647	651	9,047	4,208	5,061	1,078	26	6	21	44	7	450	2	1	-269	1,347
1994-Q1	0.862	0.831	20,864	98	8,100	4,278	5,165	1,118	19	9	19	73	6	407	0	2	-271	1,389
1994-Q2	0.862	0.835	21,226	22	9,596	4,090	5,275	1,132	12	14	14	54	2	497	0	0	-271	1,403
1994-Q3	0.862	0.843	21,263	9	11,881	4,236	5,316	1,135	12	14	9	52	4	503	1	2	-272	1,407
1994-Q4	0.862	0.847	21,545	120	16,141	4,252	5,369	1,101	21	18	14	47	3	617	0	4	-276	1,377
1995-Q1	0.858	0.851	21,982	242	15,275	4,423	5,382	1,168	26	26	14	75	6	575	1	0	-275	1,443
1995-Q2	0.858	0.855	22,459	139	26,157	4,812	5,431	1,156	17	16	21	56	5	525	0	1	-276	1,432
1995-Q3	0.858	0.859	22,626	83	17,493	5,231	5,464	1,154	15	9	17	52	3	494	1	5	-280	1,434
1995-Q4	0.858	0.863	22,930	180	18,130	5,499	5,570	1,110	25	8	16	56	8	624	1	2	-281	1,391
1996-Q1	0.859	0.868	23,208	443	19,952	5,830	5,644	1,139	27	11	22	73	6	617	2	5	-284	1,423
1996-Q2	0.859	0.874	23,774	71	22,517	6,263	5,784	1,132	16	8	19	48	9	608	1	8	-291	1,423
1996-Q3	0.859	0.877	23,813	73	24,341	6,075	5,876	1,125	13	4	13	43	4	737	2	3	-292	1,417
1996-Q4	0.859	0.883	24,072	141	27,126	6,591	5,985	1,089	23	8	17	49	2	774	4	9	-297	1,386
1997-Q1	0.846	0.887	24,080	202	30,385	6,821	6,007	1,122	25	9	14	72	7	779	4	9	-302	1,424
1997-Q2	0.846	0.889	25,131	99	31,387	7,338	6,021	1,112	19	5	11	51	7	865	0	7	-309	1,421
1997-Q3	0.846	0.891	24,798	16	31,258	8,262	6,060	1,097	8	13	17	41	8	664	1	6	-314	1,411
1997-Q4	0.846	0.894	25,252	199	43,447	8,256	6,076	1,052	16	7	18	53	7	820	4	12	-322	1,374
1998-Q1	0.842	0.895	25,418	144	34,032	9,042	6,015	1,087	17	9	12	56	7	813	0	9	-331	1,418
1998-Q2	0.842	0.896	25,920	32	40,261	9,659	5,996	1,074	14	10	22	44	7	851	2	3	-332	1,406
1998-Q3	0.842	0.899	25,416	27	56,033	8,819	5,910	1,044	6	2	20	41	7	1,341	0	7	-339	1,383
1998-Q4	0.842	0.903	25,834	131	38,026	9,950	5,763	997	9	2	18	37	13	1,253	0	6	-345	1,342
1999-Q1	0.834	0.905	25,377	176	40,207	10,952	5,614	1,021	27	6	18	37	13	1,102	1	6	-350	1,371
1999-Q2	0.834	0.911	26,412	218	38,110	11,566	5,544	986	20	5	29	32	8	1,029	0	14	-364	1,350
1999-Q3	0.834	0.916	25,360	265	39,856	11,509	5,519	964	12	3	22	23	5	987	3	6	-367	1,331
1999-Q4	0.834	0.921	26,371	163	47,491	13,089	5,475	910	18	6	23	23	8	1,120	1	17	-383	1,293
2000-Q1	0.847	0.929	25,951	277	51,913	14,344	5,431	914	21	6	27	43	12	1,006	0	12	-395	1,309
2000-Q2	0.847	0.934	25,566	146	37,725	13,978	5,413	901	11	8	17	25	6	950	1	3	-397	1,298
2000-Q3	0.847	0.938	24,880	294	37,517	14,128	5,408	877	11	2	21	27	2	892	0	8	-405	1,282
2000-Q4	0.847	0.942	26,588	35	39,967	12,305	5,306	815	11	3	26	18	3	1,004	2	16	-419	1,234
2001-Q1	0.852	0.950	25,231	174	30,538	11,089	5,125	814	12	2	33	32	15	746	0	4	-423	1,237
2001-Q2	0.852	0.956	24,634	213	28,861	10,891	4,968	784	12	4	18	20	14	646	1	6	-428	1,212
2001-Q3	0.852	0.957	24,974	161	35,401	9,778	4,772	773	8	3	18	18	10	845	1	4	-431	1,204
2001-Q4	0.852	0.959	25,630	17	31,227	9,727	4,629	744	7	5	28	17	17	702	1	4	-434	1,178
2002-Q1	0.863	0.961	25,111	58	26,747	9,849	4,497	743	14	2	19	25	14	512	0	4	-438	1,181
2002-Q2	0.863	0.967	24,916	290	37,256	9,015	4,407	726	13	3	9	25	5	584	1	4	-441	1,167
2002-Q3	0.863	0.972	24,965	31	40,367	7,473	4,300	721	9	2	6	22	6	818	0	2	-443	1,164
2002-Q4	0.863	0.976	25,604	214	28,669	7,692	4,207	714	6	14	8	20	10	766	0	3	-446	1,160
2003-Q1	0.930	0.983	26,700	149	27,402	7,190	4,092	735	10	14	7	33	4	734	0	4	-450	1,185
2003-Q2	0.930	0.985	25,629	225	28,699	8,086	3,975	741	9	17	5	30	1	594	1	1	-450	1,191
2003-Q3	0.930	0.989	26,269	874	34,071	8,646	3,902	772	24	46	9	38	3	500	1	0	-449	1,221
2003-Q4	0.930	0.992	29,568	861	42,790	9,396	3,861	803	21	40	8	61	3	501	0	2	-451	1,254
2004-Q1	0.930	1.000	28,355	828	43,363	9,802	3,812	842	26	32	4	78	3	485	1	3	-453	1,295
2004-Q2	0.930	1.008	29,087	1,399		9,763	3,807	844	24	20	10	65	1		0	1	-454	1,298

Notes: Data sample consists all CRSP firms which are non financial, non utilities, and non foreign in their last quarter. For share repurchase variables, the firms must also have share repurchase information in COMPUSTAT (data93)
Col. (2) is the tax preference parameter from Poterba (2004). It is defined as the average of $(1-tdiv)/(1-tcg)$ where $tdiv$ is marginal tax rate on dividend income and tcg is the marginal tax rate on capital gains.
Col. (3) is the Consumer Price Index (base 1 in 2004-Q1). All amounts are expressed in real 2004-Q1 dollars. Col. (4) is the total amount of regular dividends. Col. (5) is the total amount of special dividends.
Col. (6) is the total amount of share repurchases computed with data93 item in the COMPUSTAT quarterly data (purchases of common and preferred stock).
Col. (9) is the number of firms, col. (10) is the number of regular dividend payers, col. (11) is the number of special dividend payers.
Col. (12) is the number of regular dividend initiations defined as starting to pay regular dividends after not having paid for 4 quarters (6 quarters if annual payer).
Col. (13) is the number of regular dividend terminations defined as stopping regular dividends payments (see text for details).
Col. (14) (resp. (15)) are the number of intensive reg. div. increases (resp. decreases) by at least 20% in real terms in quarter t (relative to quarters $t-1$ and $t-4$). Dividend initiations are not counted as intensive increases or decreases.
Col. (16) is the number of firms repurchasing at least 0.1% of their shares in the quarter.
Col. (17) is the number of firms which enter the core sample and are paying regular dividends. Col. (18) is the number of firms leaving the core sample and which were regular dividend payers.
Col. (19) is the cumulated difference between columns (17) and (18). Column (20) is col. (10) minus col. (19): it captures the number of payers controlling for entry and exit effects.
The solid line marks the time at which the tax reform was enacted (end of May 2003) and the dashed line the time at which the tax reform was retrospectively applied (January 1st, 2003)

Table A2

Aggregate Time Series for Constant Number of Firms Sample

(1)	(2)	(3)	(4)	(5)	(6)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Quarter	Poterba (2004) tax pref.	CPI	Regular dividends (\$ mn)	Special dividends (\$ mn)	Share repurchas es (\$ mn)	Market Capitalization (\$ bn)	# firms	# regular dividend payers	# special payers	# initiations	# terminations	# intensive increase (20%+)	# intensive decrease (20%+)	# share repurchases (0.1%+)	# entrants paying dividends	# leavers who paid dividends	cumulative net change in payers	# deliberate dividend payers
1981-Q3	0.748	0.535	19,951	63		1,849	3,807	1,695	21	5								1,695
1981-Q4	0.748	0.543	19,595	216		1,803	3,807	1,489	37	5	29	70	10				-15	1,504
1982-Q1	0.800	0.550	20,129	261		1,637	3,807	1,664	90	19	40	214	11		4	14	-25	1,689
1982-Q2	0.800	0.556	19,746	20		1,578	3,807	1,596	23	8	44	47	18		2	13	-36	1,632
1982-Q3	0.800	0.564	19,240	11		1,576	3,807	1,566	19	6	37	45	30		3	17	-50	1,616
1982-Q4	0.800	0.571	18,746	34		1,900	3,807	1,447	36	4	39	57	36		5	12	-57	1,504
1983-Q1	0.811	0.576	18,776	190		2,095	3,807	1,532	56	16	30	87	39		3	17	-71	1,603
1983-Q2	0.811	0.581	20,039	722		2,364	3,807	1,505	34	5	18	148	17		2	12	-81	1,586
1983-Q3	0.811	0.588	17,973	12		2,354	3,807	1,417	14	15	30	87	8		1	16	-96	1,513
1983-Q4	0.811	0.592	19,188	80		2,333	3,807	1,396	43	12	16	99	7		2	17	-111	1,507
1984-Q1	0.821	0.599	19,843	207	8,432	2,240	3,807	1,491	52	17	16	123	6	307	4	13	-120	1,611
1984-Q2	0.821	0.605	19,728	22	11,749	2,099	3,807	1,463	23	12	16	77	7	420	2	18	-136	1,599
1984-Q3	0.821	0.609	19,514	9	13,397	2,133	3,807	1,452	23	14	25	77	9	443	5	19	-150	1,602
1984-Q4	0.821	0.613	19,196	96	10,194	2,123	3,807	1,356	50	14	29	71	7	491	4	16	-162	1,518
1985-Q1	0.824	0.620	19,347	381	15,617	2,281	3,807	1,416	69	12	34	91	6	354	5	14	-171	1,587
1985-Q2	0.824	0.624	19,263	18	19,633	2,313	3,807	1,375	28	7	22	61	7	356	3	14	-182	1,557
1985-Q3	0.824	0.628	19,032	14	13,226	2,291	3,807	1,360	19	8	30	52	6	387	8	13	-187	1,547
1985-Q4	0.824	0.633	18,442	66	16,349	2,397	3,807	1,269	45	12	30	57	9	428	0	15	-202	1,471
1986-Q1	0.826	0.638	18,881	182	11,861	2,633	3,807	1,321	58	9	27	89	8	329	1	15	-216	1,537
1986-Q2	0.826	0.638	18,846	943	8,167	2,883	3,807	1,275	27	8	40	62	13	329	5	13	-224	1,499
1986-Q3	0.826	0.643	18,652	28	13,626	2,748	3,807	1,248	21	8	26	53	16	399	2	14	-236	1,484
1986-Q4	0.826	0.648	18,368	153	19,509	2,769	3,807	1,120	43	5	27	52	8	541	2	24	-258	1,378
1987-Q1	0.861	0.655	18,854	71	10,127	3,195	3,807	1,208	52	18	26	101	6	362	2	28	-284	1,492
1987-Q2	0.861	0.661	18,825	2,353	12,726	3,327	3,807	1,194	32	18	19	59	3	381	3	13	-294	1,488
1987-Q3	0.861	0.667	18,624	1,070	12,835	3,602	3,807	1,179	25	11	19	62	7	441	2	14	-306	1,485
1987-Q4	0.861	0.673	18,562	3,339	28,770	2,597	3,807	1,105	40	17	18	57	4	1,031	4	15	-317	1,422
1988-Q1	0.874	0.679	19,253	4,260	16,283	2,781	3,807	1,186	68	12	25	93	4	574	4	9	-322	1,508
1988-Q2	0.874	0.686	19,764	206	14,044	2,814	3,807	1,170	45	26	27	52	4	456	0	13	-335	1,505
1988-Q3	0.874	0.694	20,386	1,215	12,756	2,758	3,807	1,159	35	18	24	79	4	434	2	17	-350	1,509
1988-Q4	0.874	0.701	20,976	1,599	18,201	2,749	3,807	1,074	63	13	17	55	3	557	6	20	-364	1,438
1989-Q1	0.873	0.710	19,955	2,713	14,740	2,829	3,807	1,155	67	19	15	100	4	459	3	12	-373	1,528
1989-Q2	0.873	0.719	20,427	2,533	13,726	3,001	3,807	1,142	42	21	17	78	4	417	0	9	-382	1,524
1989-Q3	0.873	0.723	20,357	3,173	14,424	3,222	3,807	1,127	43	11	19	64	4	392	2	13	-393	1,520
1989-Q4	0.873	0.729	20,313	991	14,307	3,143	3,807	1,061	64	17	25	45	6	524	0	7	-400	1,461
1990-Q1	0.876	0.740	20,740	970	14,709	2,965	3,807	1,109	53	9	21	72	3	528	1	13	-412	1,521
1990-Q2	0.876	0.748	20,866	1,103	9,949	3,112	3,807	1,100	43	13	22	57	5	467	2	4	-414	1,514
1990-Q3	0.876	0.758	20,711	744	14,452	2,852	3,807	1,105	28	16	9	36	7	615	1	4	-417	1,522
1990-Q4	0.876	0.767	20,731	368	9,457	2,690	3,807	1,041	48	5	20	40	8	678	3	6	-420	1,461
1991-Q1	0.871	0.773	20,452	415	6,613	3,095	3,807	1,059	39	13	28	33	13	353	1	3	-422	1,481
1991-Q2	0.871	0.777	20,151	66	7,477	3,254	3,807	1,058	19	10	18	44	15	287	0	2	-424	1,482
1991-Q3	0.871	0.783	19,993	415	5,098	3,371	3,807	1,046	24	6	15	32	18	296	2	7	-429	1,475
1991-Q4	0.871	0.789	20,203	198	6,904	3,442	3,807	998	31	5	10	40	14	367	0	5	-434	1,432
1992-Q1	0.871	0.795	20,281	242	8,301	3,647	3,807	1,060	28	26	15	45	11	296	2	6	-438	1,498
1992-Q2	0.871	0.800	20,765	42	9,024	3,599	3,807	1,088	14	19	11	56	6	341	2	2	-438	1,526
1992-Q3	0.871	0.806	20,738	19	9,744	3,598	3,807	1,086	13	11	13	45	10	392	1	5	-442	1,528
1992-Q4	0.871	0.811	20,845	190	7,099	3,741	3,807	1,042	31	10	14	42	7	411	0	9	-451	1,493
1993-Q1	0.860	0.815	20,409	178	14,310	3,854	3,807	1,073	20	9	17	67	12	326	2	3	-452	1,525
1993-Q2	0.860	0.820	20,640	1,170	8,862	3,882	3,807	1,092	19	20	11	46	6	356	0	12	-464	1,556

1993-Q3	0.860	0.823	20,564	696	7,375	3,997	3,807	1,088	9	10	11	44	12	346	6	8	-466	1,554
1993-Q4	0.860	0.828	20,640	650	9,028	4,194	3,807	1,034	25	6	14	42	7	378	3	20	-483	1,517
1994-Q1	0.862	0.831	20,856	95	8,084	4,261	3,807	1,064	13	8	15	68	5	342	2	13	-494	1,558
1994-Q2	0.862	0.835	21,219	21	9,561	4,072	3,807	1,074	8	12	11	53	2	417	2	4	-496	1,570
1994-Q3	0.862	0.843	21,254	7	11,849	4,218	3,807	1,077	9	13	8	50	4	410	4	5	-497	1,574
1994-Q4	0.862	0.847	21,536	107	16,118	4,233	3,807	1,043	18	16	11	43	1	509	4	10	-503	1,546
1995-Q1	0.858	0.851	21,966	241	15,252	4,404	3,807	1,104	22	22	11	67	6	483	6	7	-504	1,608
1995-Q2	0.858	0.855	22,445	139	26,127	4,791	3,807	1,094	14	13	12	54	3	443	3	10	-511	1,605
1995-Q3	0.858	0.859	22,526	82	17,458	5,205	3,807	1,078	13	5	12	49	2	408	3	16	-524	1,602
1995-Q4	0.858	0.863	22,905	179	18,081	5,471	3,807	1,035	22	8	10	49	8	518	5	12	-531	1,566
1996-Q1	0.859	0.868	23,191	435	19,887	5,797	3,807	1,049	18	8	17	68	5	505	3	24	-552	1,601
1996-Q2	0.859	0.874	23,742	71	22,438	6,218	3,807	1,030	12	6	12	44	9	489	2	30	-580	1,610
1996-Q3	0.859	0.877	23,790	71	24,227	6,030	3,807	1,019	10	3	7	38	4	596	6	17	-591	1,610
1996-Q4	0.859	0.883	24,046	140	24,654	6,542	3,807	985	20	6	8	42	2	600	12	19	-598	1,583
1997-Q1	0.846	0.887	24,040	201	30,280	6,771	3,807	1,016	21	5	10	67	7	636	10	16	-604	1,620
1997-Q2	0.846	0.889	24,952	90	31,312	7,290	3,807	1,020	12	4	9	47	7	678	10	5	-599	1,619
1997-Q3	0.846	0.891	24,770	14	31,125	8,206	3,807	1,003	5	11	10	38	8	523	8	18	-609	1,612
1997-Q4	0.846	0.894	25,229	194	43,155	8,198	3,807	966	11	6	6	48	6	643	10	24	-623	1,589
1998-Q1	0.842	0.895	25,390	141	33,909	8,988	3,807	1,000	9	8	9	50	6	642	10	16	-629	1,629
1998-Q2	0.842	0.896	25,895	5	40,078	9,603	3,807	993	8	8	11	43	5	680	4	14	-639	1,632
1998-Q3	0.842	0.899	25,399	26	55,884	8,780	3,807	978	3	1	9	38	4	1,103	13	15	-641	1,619
1998-Q4	0.842	0.903	25,788	124	37,861	9,917	3,807	935	7	2	11	35	12	986	7	17	-651	1,586
1999-Q1	0.834	0.905	25,334	171	40,062	10,920	3,807	952	17	4	10	35	10	900	2	17	-666	1,618
1999-Q2	0.834	0.911	26,386	119	37,974	11,533	3,807	923	9	5	15	29	7	817	1	24	-689	1,612
1999-Q3	0.834	0.916	25,298	263	39,319	11,478	3,807	893	7	3	17	21	2	783	7	19	-701	1,594
1999-Q4	0.834	0.921	25,949	129	47,326	13,057	3,807	837	13	4	17	22	8	877	2	28	-727	1,564
2000-Q1	0.847	0.929	25,917	275	51,756	14,303	3,807	818	15	3	19	39	12	791	2	31	-756	1,574
2000-Q2	0.847	0.934	25,407	108	37,534	13,945	3,807	826	6	7	11	21	4	744	12	7	-751	1,577
2000-Q3	0.847	0.938	24,554	292	37,414	14,096	3,807	803	7	1	14	25	2	706	6	14	-759	1,562
2000-Q4	0.847	0.942	26,499	27	39,529	12,285	3,807	766	9	2	18	17	2	804	16	21	-764	1,530
2001-Q1	0.852	0.950	25,217	160	30,482	11,073	3,807	776	8	1	18	26	14	605	11	10	-763	1,539
2001-Q2	0.852	0.956	24,630	212	28,823	10,879	3,807	757	10	3	11	18	14	533	5	9	-767	1,524
2001-Q3	0.852	0.957	24,972	74	35,372	9,770	3,807	753	4	2	16	18	10	739	8	5	-764	1,517
2001-Q4	0.852	0.959	25,629	17	31,202	9,721	3,807	728	6	4	19	16	17	626	3	11	-772	1,500
2002-Q1	0.863	0.961	25,102	52	26,737	9,845	3,807	726	9	2	16	24	14	468	3	9	-778	1,504
2002-Q2	0.863	0.967	24,915	287	37,246	9,012	3,807	718	10	3	9	24	5	545	10	4	-772	1,490
2002-Q3	0.863	0.972	24,964	31	40,361	7,471	3,807	717	6	1	5	22	6	794	4	3	-771	1,488
2002-Q4	0.863	0.976	25,604	214	28,636	7,691	3,807	713	6	14	7	20	10	744	2	4	-773	1,486
2003-Q1	0.930	0.983	26,700	149	27,388	7,189	3,807	734	9	14	7	33	4	725	0	4	-777	1,511
2003-Q2	0.930	0.985	25,629	225	28,699	8,086	3,807	741	9	17	3	30	1	588	2	3	-778	1,519
2003-Q3	0.930	0.989	26,269	872	34,071	8,646	3,807	772	23	46	9	38	3	500	1	0	-777	1,549
2003-Q4	0.930	0.992	29,568	861	42,790	9,396	3,807	803	21	40	8	61	3	501	0	2	-779	1,582
2004-Q1	0.930	1.000	28,355	828	43,363	9,802	3,807	842	26	32	4	78	3	485	1	3	-781	1,623
2004-Q2	0.930	1.008	29,087	1,399	9,763	9,763	3,807	844	24	20	10	65	1		1	1	-781	1,625

Notes: Data sample consists top 3,807 CRSP firms (ranked by market capitalization) which are non financial, non utilities, and non foreign in their last quarter.

Col. (2) is the tax preference parameter from Poterba (2004). It is defined as the average of $(1-tdiv)/(1-tcg)$ where $tdiv$ is marginal tax rate on dividend income and tcg is the marginal tax rate on capital gains.

Col. (3) is the Consumer Price Index (base 1 in 2004-Q1). All amounts are expressed in real 2004-Q1 dollars. Col. (4) is the total amount of regular dividends. Col. (5) is the total amount of special dividends.

Col. (6) is the total amount of share repurchases computed with data93 item in the COMPUSTAT quarterly data (purchases of common and preferred stock).

Col. (9) is the number of firms, col. (10) is the number of regular dividend payers, col. (11) is the number of special dividend payers.

Col. (12) is the number of regular dividend initiations defined as starting to pay regular dividends after not having paid for 4 quarters (6 quarters if annual payer).

Col. (13) is the number of regular dividend terminations defined as stopping regular dividends payments (see text for details).

Col. (14) (resp. (15)) are the number of intensive reg. div. increases (resp. decreases) by at least 20% in real terms in quarter t (relative to quarters $t-1$ and $t-4$). Dividend initiations are not counted as intensive increases or decreases.

Col. (16) is the number of firms repurchasing at least 0.1% of their shares in the quarter.

Col. (17) is the number of firms which enter the core sample and are paying regular dividends. Col. (18) is the number of firms leaving the core sample and which were regular dividend payers.

Col. (19) is the cumulated difference between columns (17) and (18). Column (20) is col. (10) minus col. (19): it captures the number of payers controlling for entry and exit effects.

The solid line marks the time at which the tax reform was enacted (end of May 2003) and the dashed line the time at which the total reform was retrospectively applied (January 1st, 2003)

Table A3

Heterogeneity Results: Mean Percent Initiating Pre and Post Reform by Quintile

Variable		Quintile					Test: q5-q1
		1	2	3	4	5	
Largest Fraction of Shares among Executives	Pre	0.00	0.35	0.30	0.95	1.86	
	Post	0.67	1.45	2.91	6.02	10.12	9.45
		(0.35)	(0.59)	(0.81)	(1.34)	(2.06)	[0.0000]
Largest Option (Unexercisable) Holding among Executives	Pre	0.98	0.83	0.42	0.41	0.73	
	Post	7.43	5.06	3.77	2.18	3.25	-4.18
		(1.66)	(1.21)	(0.98)	(0.74)	(1.00)	[0.0313]
Largest Option (Exercisable) Holding among Executives	Pre	1.08	0.73	0.73	0.51	0.32	
	Post	6.76	4.75	2.19	4.01	4.02	-2.74
		(1.54)	(1.10)	(0.79)	(1.08)	(1.09)	[0.1465]
Number of Large Holding Outside Directors ^a	Pre	0.37			0.98	2.03	
	Post	2.06			6.00	12.55	10.49
		(0.40)			(1.26)	(3.71)	[0.0050]
Percentage of Shares Held by Institutional Investors	Pre	0.76	0.76	0.56	0.85	0.65	
	Post	1.97	1.96	2.83	3.61	9.89	7.92
		(0.69)	(0.69)	(0.76)	(0.90)	(1.35)	[0.0000]
Two-year Forecasted Earnings Growth ^b	Pre	1.13	0.58	0.61	1.12	0.00	
	Post	9.51	12.96	6.05	3.94	1.53	-11.43
		(2.75)	(2.99)	(2.03)	(1.98)	(1.08)	[0.0003]
Ratio of Profits to Assets	Pre	0.00	0.15	0.51	1.29	1.67	
	Post	0.33	1.16	3.39	5.83	10.92	10.59
		(0.24)	(0.47)	(0.81)	(1.14)	(1.49)	[0.0000]
Ratio of Debt to Assets	Pre	0.84	0.60	0.65	0.85	0.71	
	Post	7.22	2.32	3.46	3.55	4.23	-2.99
		(1.17)	(0.73)	(0.84)	(0.87)	(0.92)	[0.0445]
Ratio of Cash to Assets	Pre	1.06	0.80	0.80	0.65	0.35	
	Post	4.44	2.90	4.93	3.63	4.83	0.38
		(0.98)	(0.80)	(1.00)	(0.85)	(0.95)	[0.7799]
Assets	Pre	0.60	0.75	0.70	0.70	0.90	
	Post	1.43	2.47	3.53	3.72	9.72	8.29
		(0.60)	(0.74)	(0.84)	(0.88)	(1.35)	[0.0000]

^aQuintile 1: Average number of directors = 0; quintile 4: between 0 and 1; quintile 5, >1^bTest column reports difference between q5 and q2 in this case.